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Funding Ranking 2006
Institutions – Regions – Networks

DFG Awards and Other Basic Data
on Publicly Funded Research

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Deutsche Forschungsgemeinschaft
DFG, German Research Foundation
Kennedyallee 40
53175 Bonn, Germany
Postal address: 53170 Bonn, Germany
Tel.: +49 (0) 228 885-1
Fax: +49 (0) 228 885-2777
E-mail: postmaster@dfg.de
Internet: www.dfg.de

Project management:
Daniel Bovelet, Dr. Jürgen Güdler

Project team:
Lisa Hoppe, Markus Jagsch, Michael Koch, Markus Konitzer, Izabela Paluch, Dr. Thomas Rahlf, Ernst Reeh, Andreas Schmitz, Ulrike Schneider, Heinz-Dieter Thelen

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Foreword

Germany's higher education institutions have been undergoing a process of differentiation for a long time. After some delay, this process has also begun to enter public perception. The orientation on the long-standing model of "all-rounder universities" has been replaced by universities' efforts to develop their own specific research profile and their realisation that they are competing at a state, national and global level. The German government's Excellence Initiative, which the institutions are currently implementing in cooperation with their academic environments, the DFG and the German Science Council, is accentuating this process.

The DFG's research ranking has taken on a crucial role in this competition. The data pool has increased yet again, with additional data from other funding organisations helping to provide a broader picture of publicly funded research at universities. An innovative methodology enables higher education institutions with similar research profiles to be identified, and a sound process highlights the diverse cooperation networks between institutions — including non-university institutions — that can be derived from the DFG's coordinated programmes.

Competition between higher education institutions centres only indirectly on competition for research grants, but rather around achieving the best results in research and teaching, and attracting the best researchers, academics and students. Nevertheless, we believe that research funding, which is based on a strict DFG review process, is a good indicator for research performance and achievement. An interesting finding of this report is the strong correlation between funding awarded by the DFG and that awarded by other funding bodies.

These data have been compiled, analysed and checked thoroughly, and the resulting findings and comparisons are just as differentiated and significant. We would like to take this opportunity to thank all those who have been involved in the process.

The interpretation of the tables contained in these results also requires due care. Useful as DFG funding may be as an indicator, it still only constitutes one area of a university's duties, and differs in meaning from one research area to the next. In relation to the number of professors in biology, for example, an average of seven times as much DFG funding is awarded, compared to mathematics or the humanities. A university that specialises in the humanities therefore occupies a different place in the ranking than one that specialises in the life sciences or engineering sciences. This is not to suggest, however, that these universities are less successful.

Finally, since the report elaborates and emphasises this aspect, these analyses provide valuable and comprehensive findings on the state of our science system. We recommend this report to all research stakeholders.

Professor Dr. Ernst-Ludwig Winnacker
President of the Deutsche Forschungsgemeinschaft

Professor Dr. Margret Wintermantel
President of the German Rectors' Conference

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1. Introduction

In this fourth edition of the Funding Ranking[1], the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) provides information about the distribution of DFG funds to German higher education institutions (HEIs) and non-university research institutions. Select data have been introduced that can be set in contrast to the main indicator, DFG awards. The structure of the report has also changed, owing to the new shifts of emphasis.

One of the most important objectives of this report is to provide information about the research priorities of German HEIs in terms of publicly financed research, in a differentiated manner that allows comparisons to be made. In this way, the DFG contributes to the discussion regarding university profiling, which is being led predominantly by the German Rectors' Conference.[2] Comparisons can be carried out in several ways: representatives from individual HEIs can compare the profile and position of their institution with other HEIs based on these data. They can also determine whether, and to what extent, these indicators can be used to compare different research areas. The results of the general comparison of indicators are also of interest: in view of the different indicators, can a core group of "elite universities", covering all areas, be identified? Or does the comparison in fact lead more to a differentiated view of the complex research landscape? Does this allow a completely different conclusion to be drawn about institutional, as well as subject-related strengths (and weaknesses)?

To answer these questions, the report not only uses data sources that were used in previous reports, but also new key data and methods of preparing and presenting this information. Of particular importance is data provided for the first time by the Federal Ministry of Education and Research (BMBF), which gives information on the distribution of research funding that various federal ministries allocate for direct project funding. According to figures from the Federal Statistical Office, this federal funding represents one of the three main sources of third-party funding for university research, alongside funding from the DFG and commercial business. Another important addition to previous reports is data provided by the EU office of the BMBF about initial funding in the Sixth EU Framework Programme.

Chapter 2, which follows this introduction, describes these and other sources, supported by comprehensive statistical analyses. In addition to information on the methodology and a description of the steps involved in developing the individual indicators, the chapter provides data on the specific characteristics of the research activities that form the basis for these indicators. Comparisons again play an important role. For example, what differences can be seen in terms of subject focus? At which target groups (e.g.

[1] Previous editions are available at www.dfg.de/ranking/archiv.

[2] At the conference „Profilbildung an Hochschulen — Grundlage für Qualität und Exzellenz", 30 June 2004, Berlin (see www.hrk.de/de/projekte_und_initiativen/121_2067.php).

professors at HEIs, institutes of large research organisations and/or industrial research institutes) are certain research programmes aimed? The answers to these questions allow conclusions to be drawn about the suitability or relevance of the underlying indicators for the particular subject and target group. They also offer important structural information about the German research system.

Chapter 3 outlines findings regarding the central indicator of this ranking, DFG awards. The chapter focuses on the 40 HEIs that received the largest amount of funding during the report period from 2002 to 2004, and any changes to these statistics compared to earlier reports. For the first time this report also contains "profile illustrations", which provide detailed information about the subject-oriented and funding-specific research profile of these HEIs. Divided into 14 research areas for the DFG, and 11 and 7 funding areas for the federal government and EU, respectively, the profiles show how the research activities financed by these sources impact the research institutions. The ranking uses a newly developed analytical procedure to do this. The resulting graphics can be used to show, for example, the relative importance of geoscientific research at one institution, or to what extent HEIs are involved in basic medical or biological research. Funding data provided by the German government and the EU give additional information about how institutions' specialisations are used by each research field — for example, biotechnology, information technology, or aeronautics and space.

Far from answering questions regarding the "best HEIs", these analyses primarily show how the institutions are positioned, in terms of subject and thematic specialisations, in the competition for funding and international renown.

The chapter concludes by considering the regional distribution of DFG awards. In addition to quantitative assessments, the issue of funding and research profiles (this time on a regional basis) is also important. The regional distribution of funds for selected programmes that are financed by direct federal project funding is also presented in map form. The overall view gives a very differentiated picture of each research region.

Compared to the previous ranking, the emphasis is on research area-related analyses. In this regard, **Chapter 4** analyses whether, and to what extent, DFG awards complement or contrast with other indicators for 14 research areas, which represent the entire subject spectrum at German HEIs. The focus is primarily on methodology: it is increasingly becoming standard practice for higher education institutions to establish research performance indicators in order to allocate performance-related funding (PRF). However, in doing so, they often overlook the fact that not every indicator applies equally to each research area. The data presented in this chapter allow an analysis of the suitability of certain recurring funding indicators from a subject-differentiated perspective.

Based on joint participation in selected DFG coordinated programmes, this chapter also analyses to what extent these programmes were used during the period of the report to form local and cross-regional cooperation networks between HEIs and non-university research institutions. The structures arising from these cooperation networks are illustrated according to individual research areas. Of particular note here is the formation of regional cooperation clusters.

Following the comparisons made according to research area, further analyses are presented based on HEIs with the highest amount of funding in specific federal and EU funding areas, such as biotechnology, information technology, etc. For the first time, this report also uses data obtained from the German Federation of Industrial Research Associations "Otto von Guericke" (AiF). Their data show which HEIs were particularly active in the Industrial Research Programme, which promotes knowledge transfer to medium-sized enterprises.

Chapter 5 presents comparative analyses of indicators used in the report. These analyses allow different conclusions to be drawn about the success of overall institutional participation in the research activities on which the indicators are based. As with the previous ranking group comparisons, an institution's indicator profile can be identified at a glance — first, in terms of its absolute ranking position, and secondly, in relative terms based on numbers of professors. The common theme

of specialised funding profiles is also discussed: is it possible to identify HEIs that have formed their own funding relationships — in other words, HEIs that are more inclined towards federal project funding, and those that tend to concentrate on the DFG as their main source of research funding?

A brief summary of the most important findings and a prognosis of future development plans that the DFG is pursuing with the Funding Ranking project form the conclusion of the report.

A comprehensive appendix contains tables that show the report's underlying data in a form differentiated according to HEI, research area and funding area. Data for non-university research institutions are also presented for selected DFG-based indicators.

By limiting itself to data that reflect the involvement of research institutions in publicly financed funding programmes and activities of large German and international research funding bodies, the 2006 Funding Ranking remains true to its specific aim. The increased database that has emerged as a result of successive rankings has enhanced the quality of this fourth edition. This report only touches on the analytical options provided by this data for analysing the subject- and content-defined research profiles of higher education institutions and non-university research institutions. Equally, the report only begins to explore the potential of a multiple funding body comparison for studying cooperation between HEIs and non-university research institutions, business and science, and finally, between academics in Germany, Europe and the rest of the world.

For analyses like this, the time and effort needed to compile statistics and ensure the quality of primary data sources are considerable. At the same time, it is far more efficient and leads to much more comprehensive empirical results than using survey data from HEIs and other research institutions. In the hope that the 2006 Funding Ranking meets, as did its predecessors, with a continued demand for the funding bodies involved, and especially for the HEIs described here, it is intended that the process be further developed.

2. Funding-Based Research Indicators — Basis and Background

2.1 Introduction

As its name suggests, the Funding Ranking is based mainly on data provided by research funding organisations and state institutions that illustrate various aspects of research and its funding. The comparative study of this information allows multi-faceted research profiles to be identified for the higher education institutions that benefit from such funding. Bringing together data from so many different sources also presents methodological challenges. The data that form the basis of this report, and the possibilities (and restrictions) for analysing these data, are described below.

The first two editions of the ranking only contained data on DFG research funding. Owing to the broad, positive feedback to this type of report, other funding bodies participated in the 2003 ranking. In collaboration with the Alexander von Humboldt Foundation (AvH) and the German Academic Exchange Service (DAAD), which provided data on their funding of international visiting researchers, it was possible to analyse the DFG third-party research funding behaviour of HEIs in relation to indicators focussing on the aspect of international appeal. In addition, it was also possible to use data obtained from the European Commission to compare HEI participation in the Fifth EU Framework Programme (see DFG 2003).

The database was expanded further for the 2006 Funding Ranking. In addition to general basic data, there are twelve indicators, which can be assigned to four diverse categories:

1. Basic data
   - > HEI personnel
   - > HEI expenditure
2. Third-party funding indicators
   - > General third-party funding income of HEIs
   - > DFG awards
   - > Direct R&D project funding by the German government
   - > R&D funding in the Sixth EU Framework Programme
   - > AiF funding for R&D
3. Scientific expertise and top-level researchers
   - > DFG review board members
   - > DFG reviewers
   - > DFG Leibniz prizewinners
4. International appeal
   - > Visiting researchers sponsored by the AvH
   - > Foreign visiting researchers funded by the DAAD
5. Research-related cooperation activities and networks
   - > Participation in cooperative DFG research programmes
   - > Number of institutions cooperated with in these programmes

The scope of this ranking is described below, with brief methodological accounts of the subject-related and thematic classification of different funding activities, as well as the development of an institutional classification for all sources. The main portion of the chapter describes the

indicators. The chapter concludes with a comparative analysis of the specific characteristics of the indicators used.

2.2 Methodological Aspects

2.2.1 Report Focuses

As in the previous ranking, the analyses focus primarily on HEIs that received a certain minimum grant volume from the DFG (€0.5 million in three years) during the period of the report, 2002 to 2004. The amount corresponds to about four to five successful proposals for research grants in the individual grants programme. This figure is relatively low. The report therefore mainly concentrates on DFG-active higher education institutions. A total of 84 HEIs meet this minimum grant volume (compared to 80 HEIs in the 2003 ranking).

Analyses that were carried out according to research area (in chapter 4) are restricted to those 20 HEIs that received the highest grant volume in the respective research areas. The same applies to grants from the German government, the AiF and the EU, where the 20 most successful HEIs in the respective funding areas are analysed. Rankings that cover all subject areas focus on the 40 HEIs receiving the highest amount of DFG funding. The tables in the appendix mostly list the indicators for all 84 HEIs included in the report. Data for non-university research institutions, corresponding to the DFG-based indicators, are also included.

2.2.2 Subject-related and Thematic Classification

Subject-related analyses are a key area of this report. The DFG's four-tiered subject classification system, which was thoroughly revised after the restructuring of review committees to review boards in 2003 (see section 2.3.3), forms the basis for these analyses. It now comprises 201 subjects that are assigned to 48 review boards, 14 research areas, and 4 scientific disciplines in ascending hierarchical order. Table 2-1 shows the three top levels of this system. Table A-1 in the appendix shows the remaining classification according to subject. This report analyses the top two levels, i. e. research area and scientific discipline, which also provide the reference for the subject-related classification of external data.

Two levels of the classification system, subject areas and review boards, provide the operational structure necessary to process proposals. If the DFG receives a proposal in its general funding programmes (particularly for individual research grants), its subject matter is analysed and a decision is made as to which subject the proposal should be assigned. This means that assigning the proposal is operational; that is, it directly affects the processing (used to identify the employee responsible for a particular subject), assessment (relevant reviewers), and finally, evaluation (the responsible review board) of the applications (see section 2.3.3).

By contrast, subject-related classifications for Collaborative Research Centres, Research Training Groups, Priority Programmes and scientific prizes take place solely for statistical and PR-related purposes.[1] In this context, each particular sub-project is recorded separately for Collaborative Research Centres, Priority Programmes and Research Units.

Subject-based classification is less differentiated in the DFG Research Centre programme, introduced in 2001. Estimates were made based on information received about the research fields (see section 2.3.5).[2]

In order to be able to compare data from other funding bodies and the Federal Statistical Office with DFG research areas, it was necessary to establish subject correlations. Databases were created for previous editions of the ranking,

[1] For instance, projects funded in these programmes are documented according to subject area in the DFG's online version of its annual report (www.dfg.de/jahresbericht) and in GEPRIS, an abstract database for DFG-funded projects (see www.dfg.de/gepris).

[2] Of the funds awarded to the DFG Research Centre "Functional Nanostructures" in Karlsruhe, 47% are allocated to chemistry and 53% to physics. At the "Molecular Physiology of the Brain" Research Centre in Göttingen, 82% of the funds are allocated to medicine and 18% to biology. At the "Ocean Margins" Research Centre in Bremen, all funds are allocated to the geosciences. In addition, 55% of the funds for the "Rudolf-Virchow-Centre for Experimental Biomedicine" Research Centre in Würzburg are assigned to medicine and 45% to biology, while all funds for the "Matheon" in Berlin are awarded to mathematics.

Table 2-1:
DFG system of review boards, research areas and scientific disciplines (2006)

Review board	Research area	Scientific discipline
101 Ancient cultures	Humanities	Humanities and social sciences
102 History		
103 Fine arts studies		
104 Linguistics		
105 Literature, theatre and media studies		
106 Ethnology, non-european cultures and religious studies		
107 Theology		
108 Philosophy		
109 Education sciences	Social and behavioural sciences	
110 Psychology		
111 Social sciences		
112 Economics		
113 Jurisprudence		
201 Foundations of biology and medicine	Biology	Life sciences
202 Plant science		
203 Zoology		
204 Microbiology, virology and immunology	Medicine	
205 Medicine		
206 Neurosciences		
207 Agriculture, forestry, horticulture and veterinary medicine	Veterinary medicine, agriculture and forestry	
301 Molecular chemistry	Chemistry	Natural sciences
302 Chemical solid state research		
303 Physical chemistry of molecules, liquids and interfaces, general theoretical chemistry		
304 Analytical chemistry and method development		
305 Chemistry of biological systems		
306 Polymer research		
307 Condensed matter physics	Physics	
308 Optics, quantum optics and physics of atoms, molecules and plasmas		
309 Particles, nuclei and fields		
310 Statistical physics and nonlinear dynamics		
311 Astrophysics and astronomy		
312 Mathematics	Mathematics	
313 Atmospheric science and oceanography	Geosciences	
314 Geology and palaeontology		
315 Geophysics and geodesy		
316 Geochemistry, mineralogy and crystallography		
317 Geography		
318 Water research		
401 Production technology	Mechanical and industrial engineering	Engineering sciences
402 Mechanics and constructive mechanical engineering		
403 Process engineering and technical chemistry	Thermal and process engineering	
404 Heat energy technology, thermal machines and drives		
405 Materials engineering	Material science and engineering	
406 Materials science and raw materials		
407 System engineering	Computer science, electrical and system engineering	
408 Electrical engineering		
409 Computer science		
410 Construction engineering and architecture	Construction engineering and architecture	

which were used to compile data for the Federal Statistical Office[3]; the DAAD[4], which retained its 218 subjects and 7 subject group classifications; and the AvH, which differentiates between 185 subject groups and 3 broad subject areas.[5]

These studies were carried out in order to ensure that the data were sufficiently compatible. It should also be noted that information from different sources does not always refer to the same object: visiting researchers working in the AvH subject "effectiveness of medication" could perform their work either for an institute of pharmacology (covered by chemistry in the DFG classification) or for an institute allocated to the field of medicine. Equally, a project that was assigned to the DFG's mathematics research area might be carried out by a researcher working at an engineering institute, just as an employee managing the personnel statistics of an HEI could assign an academic who is working in a geosciences institute to the teaching and research area "town and country planning" (covered by the DFG research area "construction engineering and architecture").

As with previous editions of the ranking, subject-based graphics are restricted to the 14 research areas described. Although there are overlaps between related research areas (research has a fundamentally interdisciplinary structure in terms of its focus, and is only limited to individual subject areas to a certain extent), these are accounted for in order to provide a sufficiently differentiated approach.

The 2006 Funding Ranking contains new features. Analyses have been extended to incorporate thematic research fields derived from the funding activities of the German government (particularly the BMBF) and the Sixth EU Framework Programme. The information obtained about core research areas provides new opportunities for gaining a more differentiated view of research funded by third parties at German HEIs, both in terms of funding and thematic profiles. For the purposes of this report, the different core research areas of the federal government and the EU have been merged into "thematic funding areas".

Table 2-2 shows the separate classifications for both sources.[6]

By looking at subject priorities on the one hand and involvement in federal and EU-funded programmes with respect to funding area on the other hand, comparative analyses may be made. For example, does an HEI that has high DFG funding in mechanical engineering use this specialisation to concentrate on aeronautical and space research for the federal government and the EU? Which subject profiles are associated with a strong presence in the EU and federal funding priority "biotechnology"? Finally, do "related" funding programmes of the DFG, the federal government and the EU generally serve academics in the same university field, or are there specific relationships between HEIs and the different funding bodies?

2.2.3 Institutional Classification of Data

In addition to combining the different subject classification systems, another important step was necessary to create a correlation that allowed a comparison of the different institution keys and specifications of the partners involved in the ranking. The reference model is a database created by the DFG entitled "Research Explorer", extracts of which will be available as of the beginning of 2007 on the internet (see www.dfg.de/Rex). The Research Explorer is primarily aimed at international target groups. It has been written in two languages

[3] In contrast to the previous ranking, the teaching and research area "sport" has been included in the field "social and behavioural sciences" (see Table A-3 in the appendix). In addition, the Federal Statistical Office's system of classifying teaching and research areas meant that it was not possible to correlate the DFG system of classifying the field of mechanical engineering. In comparative analyses with these figures, the respective areas are therefore combined into a joint area of "mechanical engineering, process engineering and materials science".

[4] Fine arts subjects such as "harp, guitar, lute" or "free art" were not included in the analysis.

[5] Since the classification systems used by the AvH and the DFG do not always correlate perfectly (above all, in the humanities and engineering sciences), there are some minor deviations from comparable AvH analyses (see "Humboldt-Ranking", www.avh.de/de/aktuelles/presse/pn_archiv_2006/2006_ranking.htm).

[6] An overview of the classifications is also given in section 2.3.2, and in Table A-2 in the appendix for the German government's funding programmes.

Table 2-2:
Schematic overview of thematic funding areas as used by the German government and within the EU's Sixth Framework Programme

Thematic funding areas for direct R&D project funding by the German government
Biotechnology
R&D in the health sector
Large-scale equipment for basic research
Physical and chemical technologies
Sustainable development
Geosciences[1)]
Aeronautical and space research[2)]
Energy research and energy technology
Materials research
Information technology
Structural engineering, transport and mobility[3)]
Thematic funding areas for R&D funding within the EU's Sixth Framework Programme
Life sciences, genomics and biotechnology for health
Information society technologies
Nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices
Aeronautics and space
Food quality and safety
Sustainable development, global change and ecosystems
Citizens and governance in a knowledge-based society

[1)] The funding area „geosciences" includes the following funding priorities: „marine and polar research", „geosciences" and „marine technology".

[2)] The „aeronautical and space research" area includes the following categories: „aeronautical research and hypersonic technology" and „space research and space technology".

[3)] The „structural engineering, transport and mobility" funding area includes the following categories: „regional planning and urban development; building research" and „research and technology for mobility and transport (including traffic safety)".

(German and English), and allows targeted searches of institutions, based on a system of selected subject areas or keywords in institutions' names. The search can be restricted to specific regions or institution types (higher education institutions, Max Planck institutes, etc.). Detailed information about these research institutions can be found by following the regularly updated links to these institutes' websites in the Research Explorer.[7]

A methodological challenge that was faced for the first time in this ranking was presented by a development affecting university hospitals. Of particular note is the situation in Berlin, where hospital clinics at the Free University of Berlin (FU) and the Humboldt University of Berlin (HU) have been run as a single body, the "Charité University Medical Centre Berlin" since 2003. The hospitals were merged in the second half of the period covered by this report. Up until the time of the merger, grants awarded to researchers from the Charité, either by the DFG or other funding bodies participating in this ranking, were assigned to one of the two universities. Since the restructuring, all funding bodies have initiated a step-by-step process in which new awards are referred to as "Charité grants". In order to ensure consistency when processing these types of mergers, a compromise was necessary for this report: if data had already been recorded for these "new" institutions in the data sources, it was divided 50:50 between the partner universities of the hospital. In general, the amounts awarded in the brief period since these mergers are relatively

[7] The DFG project information system, GEPRIS, is another publicly accessible use of the institute's database. Its new version will also be available at the beginning of 2007 and, in addition to targeted searches according to keywords and people's names, it will also allow searches for projects per institution, subject area and institute (see www.dfg.de/gepris).

small.[8] The ratios have therefore had little or no effect on the findings reported.[9] For future analyses, figures for university institutions that have been merged or become independent will be recorded separately.[10]

Finally, it should also be noted that "An-institutes" (i. e. research institutes or establishments associated with HEIs) are regarded as independent institutions.

2.3 Funding-based Research Indicators

2.3.1 Basic Data

2.3.1.1 HEI Personnel

In addition to analysing absolute data, an important element of ranking studies (which, after all, are based on comparisons) is comparing the data with figures that make it possible to assess the extent of an institution's size. In the 2006 Funding Ranking, these kinds of assessments are restricted to the 84 HEIs included in the report that received more than €0.5 million in DFG awards between 2002 and 2004. This takes into account an institution's total number of academic staff active in 2003, in particular the number of professors (full-time equivalents). These figures are provided annually by the Federal Statistical Office, which works in conjunction with state statistical offices to obtain institutional data differentiated according to 78 teaching and research areas and according to the 2 personnel areas "professors" and "total scientific and artistic staff".

In 2003, almost 37,500 professors, or 147,000 academics, were employed in their main profession at the 356 HEIs documented by the Federal Statistical Office. The academic staff is comprised of professors (including junior professors), research and artistic staff, lecturers, assistants, and teaching staff for specific tasks. The figures also include assistant lecturers, academic support staff and visiting academics as part-time staff.[11] The 84 higher education institutions that form the basis for the summary in Table 2-3 employed more than 21,000 professors and a total of 124,000 academics in 2003, which is 57% of all professors working in German HEIs and 85% of all academics in total.[12] The assignment to DFG research areas used in the overview was based on the correlation with the teaching and research area classification system used by the Federal Statistical Office, which can be found in the appendix (see Table A-3).

The proportion of professors in the academic staff is 17.2% for these 84 higher education institutions, which is roughly the same level as for the 2003 Funding Ranking (15.9%). In the 2000 Funding Ranking, the percentage was 16.2% (see DFG 2003: p. 25; DFG 2000: p. 32). As previously observed, there are considerable differences from one research area to another. For example, whereas professors working in the humanities and social sciences account for a quarter to a third of the academics working in a research area, the proportion in the engineering sciences fluctuates between 12% and 20%. The proportion of professors is lowest in the field of medicine (8%) and highest in mathematics and in the humanities (each over 30%).

[8] In the period of the report, the project database of the DFG shows that €12.0 million was awarded to the Charité, which was divided 50:50 between the Humboldt University (HU) and Free University (FU) of Berlin. An amount of €4.3 million was awarded to the University Clinic of Schleswig-Holstein, a merger of the medical centres of the universities of Kiel and Lübeck formed at the beginning of 2003, which was also divided between the two universities. For the university hospitals of Marburg and Giessen, which were merged at the beginning of 2005, the data used in this report continued to be classified according to institution, so that it was not necessary to divide the data between the two universities.

[9] An exception to this is the data on direct R&D project funding by the federal government. In this source, funds awarded to the Charité were reported for the entire report period (from 2002). The total amount is €39 million, also divided 50:50 between the FU and the HU.

[10] Beyond that, some university mergers have occurred since the previous ranking that were important for this report. In 2001 and 2003, respectively, the Pedagogical University of Erfurt and the Catholic-Theological Faculty of Erfurt were integrated into the University of Erfurt. The universities of Duisburg and Essen were also merged into the University of Duisburg-Essen at the beginning of 2003. At the beginning of 2005, the Hamburg University of Economics and Politics was integrated into the University of Hamburg, and the Lüneburg University of Applied Sciences was integrated into the University of Lüneburg — the first merger of a university of applied sciences (Fachhochschule) and a university in Germany. The respective findings were aggregated in each case.

[11] See Federal Statistical Office (2005), Hochschulstandort Deutschland 2005, page 10.

[12] Tables A-4 and A-5 in the appendix indicate the number of professors and the total number of academics employed at HEIs differentiated according to institution and discipline.

Table 2-3:
Total number of professors/scientists and academics (as of 2003) by DFG research area

DFG research area	Professors	Scientists/ academics total	Percentage of professors
	N	N	%
Humanities	4,111	12,688	32.4
Social and behavioural sciences	4,793	16,934	28.3
Humanities and social sciences	**8,904**	**29,622**	**30.1**
Biology	998	5,221	19.1
Medicine	3,340	41,040	8.1
Veterinary medicine, agriculture and forestry	655	3,179	20.6
Life sciences	**4,993**	**49,440**	**10.1**
Chemistry	905	5,466	16.6
Physics	1,115	6,282	17.8
Mathematics	1,194	3,816	31.3
Geosciences	713	2,975	24.0
Natural Sciences	**3,928**	**18,539**	**21.2**
Mechanical and process engineering and materials science[1)]	1,092	8,936	12.2
Computer science, electrical and system engineering	1,431	8,676	16.5
Construction engineering and architecture	835	4,254	19.6
Engineering sciences	**3,358**	**21,865**	**15.4**
No classification possible	**208**	**4,788**	**4.3**
Total	**21,389**	**124,255**	**17.2**

Based on: 84 higher education institutions that received a total of more than half a million euros in DFG awards between 2002 and 2004.

[1)] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, "mechancial and process engineering and materials science".

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

In general, this report takes into account the number of professors employed by an HEI, since these figures are far more reliable than figures on total numbers of academic staff (as feedback to previous rankings has shown).

2.3.1.2 HEI Expenditure

In addition to compiling annual figures relating to staff, the state statistical offices, under the supervision of the Federal Statistical Office, also compile data about the total income of HEIs. These figures are significant for this report because they allow an assessment of the relative importance of third-party funding income.

The Federal Statistical Office differentiates between three large income groups: "administrative income" (including income from university hospital care), "third-party funding income" and "basic funds". In the Federal Statistical Office's definition, these are all used to cover "HEI expenditure". The figures are compiled on an annual basis and differentiated according to 78 teaching and research areas (see Table A-3 in the appendix). The data from the Federal Statistical Office provide information about the income of 356 German higher education institutions between 2001 and 2003. As for the other sources used here, the figures reported for these years are recorded as totals; that is, annual averages are not reported.

The expenditures of these 356 HEIs amounted to over €80 billion for the years 2001 to 2003.[13] A total of €27.7 billion in administrative income, €9.8 billion

[13] Table A-6 in the appendix shows the financial data provided by the Federal Statistical Office for higher education institutions covered by this report.

Table 2-4:
Current expenditure of higher education institutions from 2001 to 2003 by DFG research area

DFG research area	Current expenditure (total)	Administrative income		Third-party funding income		Current basic funds	
	Mio. €	Mio. €	% of total	Mio. €	% of total	Mio. €	% of total
Humanities	3,221.1	15.5	0.5	441.6	13.7	2,764.0	85.8
Social and behavioural sciences	4,296.6	83.0	1.9	695.5	16.2	3,518.2	81.9
Humanities and social sciences	**7,517.7**	**98.5**	**1.3**	**1,137.1**	**15.1**	**6,282.1**	**83.6**
Biology	1,678.8	13.1	0.8	507.1	30.2	1,158.7	69.0
Medicine	37,167.8	26,085.4	70.2	2,630.1	7.1	8,452.3	22.7
Veterinary medicine, agriculture and forestry	1,299.2	121.2	9.3	265.3	20.4	912.7	70.2
Life sciences	**40,145.8**	**26,219.6**	**65.3**	**3,402.5**	**8.5**	**10,523.7**	**26.2**
Chemistry	1,645.5	16.7	1.0	432.5	26.3	1,196.3	72.7
Physics	1,851.6	11.9	0.6	649.7	35.1	1,190.0	64.3
Mathematics	982.5	3.8	0.4	201.3	20.5	777.4	79.1
Geosciences	915.0	7.1	0.8	298.0	32.6	610.0	66.7
Natural Sciences	**5,394.5**	**39.4**	**0.7**	**1,581.5**	**29.3**	**3,773.6**	**70.0**
Mechanical and process engineering and materials science[1)]	2,851.8	59.3	2.1	1,216.3	42.7	1,576.1	55.3
Computer science, electrical and system engineering	2,083.1	31.7	1.5	669.4	32.1	1,382.0	66.3
Construction engineering and architecture	1,214.2	85.2	7.0	326.4	26.9	802.6	66.1
Engineering sciences	**6,149.0**	**176.2**	**2.9**	**2,212.1**	**36.0**	**3,760.7**	**61.2**
No classification possible	**11,637.5**	**608.4**	**5.2**	**976.5**	**8.4**	**10,052.7**	**86.4**
Total	**70,844.6**	**27,142.2**	**38.3**	**9,309.7**	**13.1**	**34,392.8**	**48.5**

Based on: 84 higher education institutions that received a total of more than half a million euros in DFG awards between 2002 and 2004.

[1)] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, "mechancial and process engineering and materials science".

Source:

Federal Statistical Office: Current expenditure, administrative income, third-party funding income and current basic funds by higher education institution and teaching and research field (2001 to 2003).

Calculated by the DFG.

in third-party funding income and €42.5 billion in basic funds were used to cover the institutions' expenditure. Table 2-4 shows only those higher education institutions that received more than €0.5 million in DFG awards between 2002 and 2004. The total amount of expenditure for these HEIs comes to €70.8 billion. This is 89% of the expenditure of all German HEIs. The third-party funding received by these HEIs (€9.3 billion), however, accounts for 95% of all funding — clear proof that by focussing on the institutions that receive the most DFG funding, the report also covers the most active HEIs in terms of third-party funding.

On average, 38% of the expenditure for the 84 HEIs in the report is covered by administrative income (primarily university hospital income), 13% by third-party funding income, and 49% by basic funds. By far the highest costs are in medicine. With €37.2 billion over three years, the costs for this research area represent almost half of the total expenditure of HEIs. However, this is brought into sharp perspective by the fact that medicine also accounts for the largest share of universities' administrative income, which is mainly due to income from hospital services. Almost 96% of the €27.1 billion indicated above for "administrative income" is accounted for by income from the field of medicine. If administrative income is excluded from the calculation, the proportion of third-party funding comes to 21% (medicine: 24%; veterinary medicine, agriculture and forestry: 23%).

2.3.2 Third-party Funding Indicators

2.3.2.1 General Third-party Funding Income of HEIs

"Third-party funding income" denotes money that comes from sources other than the responsible government ministries' budgets for basic funding. Academics usually apply directly for this funding from different public research funding bodies and private business.

According to figures from the Federal Statistical Office, third-party funding accounts for 13% of the income for the HEIs covered in this report (see Table 2-4). Research areas in the natural sciences and engineering sciences receive a particularly large amount of funding. Of note here are the geosciences and physics (33% and 35%) and the combined area of "mechanical engineering, process engineering and materials science" (43%). Above-average figures are also seen in biology (30%), chemistry (26%), and for those subjects included in the category "computer science, electrical and system engineering" (32%). By contrast, the humanities (14%) and the social and behavioural sciences (16%) have relatively low proportions.

At first glance, medicine appears to receive very little third-party funding. However, this is put into perspective when one considers this subject's unique source of revenue: hospital activities. Compared to the other research areas, medicine has in fact received the highest amount of third-party funds (€2.6 billion over three years), and represents more than 28% of all the third-party funding income of the HEIs included in this study.

The impression that a large third-party funding discrepancy exists between different research areas is reinforced if one compares these funds to the number of academics working in a research area (see Table 2-5). Whereas a professor working in the humanities and social sciences receives an average of €130,000 in third-party funding in three years, the corresponding average in the engineering sciences is approximately €660,000 — more than five times as much. Of note is the per capita average, highest in the category "mechanical engineering, process engineering and materials science", followed by medicine.

The large range that Table 2-5 indicates with regard to the per capita distribution of third-party funds takes on particular significance when the overall income of HEIs from third-party funding is considered. As the figures show, when it comes to competing for third-party funding, higher education institutions that specialise in medical or engineering disciplines enjoy clear advantages over HEIs that specialise in other areas. These advantages must be considered when interpreting HEI rankings.

If the allocation of third-party funding is regarded as a performance indicator for an institution, perhaps with a view to providing performance-related funding (PRF)[14], the differences highlighted in this report between the various research areas show clearly why it is necessary to take into account subject-specific standards when considering these factors. A law professor or economist requires far less third-party funding to be considered research active than, for example, an engineer or chemist. In terms of third-party funding-based factors, "success" is not based on competition between disciplines, but rather within the disciplines.

Table A-7 in the appendix shows the data provided by the Federal Statistical Office regarding total third-party income for institutions covered in this report according to research area.[15]

[14] In 2005, the DFG published recommendations for the performance-related allocation of funds in medicine (see www.dfg.de/aktuelles_presse/reden_stellungnahmen/2004/download/stellungnahme_klinische_forschung_04.pdf).

[15] When interpreting the amounts shown per higher education institution and research area, one factor must be considered that has a much different impact depending on the location: about 12% of all third-party funding for the HEIs in this report is not classified according to subject. This category includes "central funds", which are the third-party funds of libraries or other central bodies, and funds for computer centres. Some institutions, however, are increasingly including subject-specific funds in their central funds instead. The last column in Table A-7 shows the extent of the non-allocated subject proportion for each HEI. Particularly high figures are shown for the University of Constance (45%) and the universities of Hannover and Kiel (34% each). Göttingen (29%) and Hamburg (27%) are also of note. This should be considered when analysing the comparisons in chapter 4 per research area.

Table 2-5:
Third-party funding income of higher education institutions 2001 to 2003 in relation to the total number of professors/scientists and academics (as of 2003) by DFG research area

DFG research area	Third-party funding income	Professors		Scientists/academics total	
	Mio. €	N	K € per prof.	N	K € per scientist
Humanities	441.6	4,111	107.4	12,688	34.8
Social and behavioural sciences	695.5	4,793	145.1	16,934	41.1
Humanities and social sciences	**1,137.1**	**8,904**	**127.7**	**29,622**	**38.4**
Biology	507.1	998	508.1	5,221	97.1
Medicine	2,630.1	3,340	787.5	41,040	64.1
Veterinary medicine, agriculture and forestry	265.3	655	405.0	3,179	83.5
Life sciences	**3,402.5**	**4,993**	**681.5**	**49,440**	**68.8**
Chemistry	432.5	905	477.9	5,466	79.1
Physics	649.7	1,115	582.5	6,282	103.4
Mathematics	201.3	1,194	168.5	3,816	52.7
Geosciences	298.0	713	418.1	2,975	100.2
Natural sciences	**1,581.5**	**3,928**	**402.7**	**18,539**	**85.3**
Mechanical and process engineering and materials science[1)]	1,216.3	1,092	1,113.8	8,936	136.1
Computer science, electrical and system engineering	669.4	1,431	467.9	8,676	77.2
Construction engineering and architecture	326.4	835	390.9	4,254	76.7
Engineering sciences	**2,212.1**	**3,358**	**658.8**	**21,865**	**101.2**
No classification possible	**976.5**	**208**		**4,788**	
Total	**9,309.7**	**21,389**	**435.2**	**124,255**	**74.9**

Based on: 84 higher education institutions that received a total of more than half a million euros in DFG awards between 2002 and 2004.

[1)] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, „mechancial and process engineering and materials science".

Source:

Federal Statistical Office: Total third-party funding income (2001 to 2003) and full-time scientific and artistic staff (full-time equivalent; 2003) by higher education institution and teaching and research field.

Calculated by the DFG.

2.3.2.2 Sources of Third-party Funds

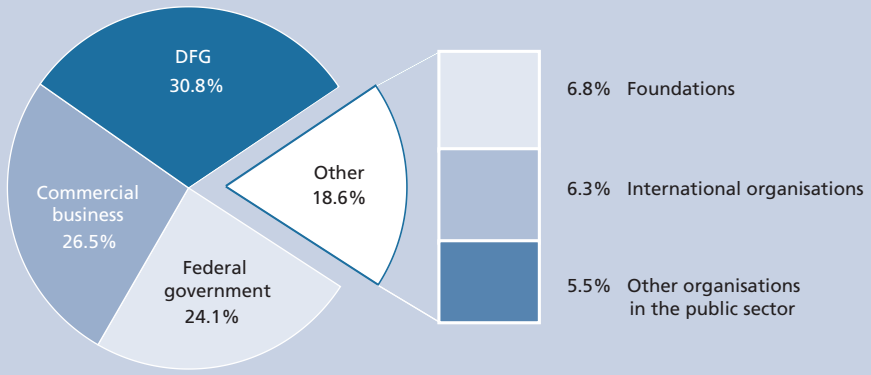
In addition to compiling data on third-party funding per higher education institution and teaching and research area, the Federal Statistical Office also carries out annual studies regarding the source of third-party funding, which is divided into six categories. The information is gathered separately with the major disadvantage that the findings do not allow any conclusions to be drawn about the significance of the different funding bodies for each research area. The funding information provided by the German government, the EU, and the AiF (German Federation of Industrial Research Associations) therefore represents a considerable addition to this Funding Ranking.

If one takes the data compiled by the Federal Statistical Office as a basis, DFG funds account for 31% of the €9.8 billion of third-party funding for all HEIs during the period of the study. Federal funds account for 24% and commercial business for 27%. Thus, the DFG remains the largest single funding organisation for third-party funded research at higher education institutions (see Figure 2-1).

2.3.2.3 DFG Awards

Financial statistics on the funding activities of the DFG refer to grants and information about the years in which these grants were awarded. The analysis is based on almost 40,000 funding decisions made between 2002 and 2004, with grant amounts ranging from a few thousand to several million euros. Grants in the region of a few thousand euros were awarded for items such as publication allowances or for run-out funding

Figure 2-1:
Third-party funding income of higher education institutions from 2001 to 2003 by source



Source:
Federal Statistical Office: Third-party funding income of higher education institutions by source (2001 to 2003). Calculated by the DFG.

for short-term projects. Grants of several million euros include awards to Research Units or DFG Research Centres set up in 2001 and prizewinners in the Gottfried Wilhelm Leibniz Programme (the prize is usually €1.55 million).

Table 2-6 shows how the awards covered by this report were distributed across the various funding programmes of the DFG.[16] The table differentiates between the individual grants programme, direct funding of young researchers, coordinated programmes and prizes. The data used in this ranking practically covers all the subject-related programmes funded by the DFG.[17] The total amount of grants awarded between 2002 and 2004 is €3.7 billion.

In this period, the highest amount was awarded in the individual grants programme (36% in total). The Collaborative Research Centre programme, including programme variants, also received a large share of the grants (over €1.1 billion), as did the Priority Programmes (€460 million). Coordinated programmes received a total of 58% of the funds, while funding for the direct promotion of young researchers accounts for about 5%. A total of €50 million was set aside for 100 prizes in three years (1.4% of the total volume), the majority of which (€46.5 million) went to the Gottfried Wilhelm Leibniz Prize.

Over the period of the report from 2002 to 2004, the DFG awarded grants to a total of 154 higher education institutions (97 universities, 48 universities of applied sciences and 9 universities of art and music) and 411 non-university institutions. HEIs received 88.6% of the total grant volume (see Table 2-10), of which the 84 institutions examined more closely in this report received 88% of the overall funds. Thus, the report covers almost all of the higher education institutions funded by the DFG.

With reference to the HEIs in this report, Table 2-7 shows the amounts that were awarded to each research area. Medicine and biology received the largest share of the DFG grant budget between 2002 and 2004, followed by mechanical engineering subjects. The table also shows the per capita grant amount for professors and academics working in the HEIs (full-time equivalents).

[16] For more information about the specific orientation of these programmes, please refer to the DFG website at www.dfg.de/en/research_funding.

[17] The report does not cover funds for developing international scientific contacts or funds used for developing general infrastructure (central research facilities and library funding). The most striking aspect of this is with regard to the research vessel METEOR, which is run by the University of Hamburg. The amount of funding provided by the DFG between 2002 and 2004 for this project as part of the central research facilities programme totals €27.8 million.

Table 2-6:
DFG funding in each programme from 2002 to 2004

Programme group/Programme	Number		Funds	
	Programmes	Individual allocations	Mio. €	%
Individual grants		**14,560**	**1,310.9**	**35.6**
Individual proposals[1)]		13,656	1,305.0	35.4
Grants for printing and publication[2)]		904	5.9	0.2
Coordinated programmes	**1,105**	**22,893**	**2,132.4**	**57.9**
Collaborative Research Centres and programme variations	359	14,501	1,128.4	30.6
thereof Collaborative Research Centres	305	13,531	1,048.9	28.5
thereof Transfer Units	30	106	7.7	0.2
thereof Cultural Studies Research Centres	5	247	20.6	0.6
thereof Transregional Collaborative Research Centres	19	617	51.2	1.4
Research Centres	5	90	83.9	2.3
Research Training Groups	401	1,389	231.8	6.3
Priority Programmes	146	4,524	461.6	12.5
Research Units	170	2,123	205.6	5.6
Clinical Research Units	24	266	21.2	0.6
Direct promotion of young researchers		**2,019**	**189.1**	**5.1**
Research Grants		1,237	44.3	1.2
Heisenberg Programme		253	28.7	0.8
Emmy Noether Programme		529	116.1	3.2
thereof Fellowships abroad[3)]		130	6.9	0.2
thereof Independent Junior Research Groups[4)]		399	109.2	3.0
Prizes		**101**	**50.4**	**1.4**
Gottfried Wilhelm Leibniz Prize		34	46.5	1.3
Gerhard Hess Programme		31	3.4	0.1
Heinz Maier-Leibnitz Prize		18	0.3	0.0
Communicator Award		3	0.2	0.0
Bernd Rendel Prize		11	0.02	0.0
Albert Maucher Prize		2	0.02	0.0
Ursula M. Händel Animal Welfare Prize		2	0.03	0.0
Total	**1,105**	**39,573**	**3,682.7**	**100.0**

[1)] Including funding initiatives in bioinformatics, clinical studies and scientific networks
[2)] Including printing grants for journals
[3)] Phased out in 2005
[4)] Including individual proposals in the Emmy Noether Programme and the Action Plan in Computer Science

Just as with third-party funding income, per capita grants reveal large differences between the DFG-related third-party funding income of different subjects. Whereas, for example, a professor working in the humanities may receive a grant amount of almost €70,000 over three years (and therefore almost two-thirds more than an academic working in social or behavioural sciences), the corresponding amount for a professor working in biology is more than seven times as much, at €500,000. Academics working in mathematics or construction engineering and architecture also have similarly low amounts, as do the humanities. Professors working in mechanical engineering, physics, chemistry and the geosciences, however, receive high amounts.[18]

Both in terms of DFG awards and overall third-party funding, there are very clear differences in the third-party funding requirements of the different disciplines. As already demonstrated by the impact of HEIs' internal performance-related funding (PRF) (see section 2.3.2.1), sources of third-party funding also vary according to subject — both in their amount and also their significance

[18] Tables A-9 to A-13 in the appendix show the average grant amounts per professor and academic for each higher education institution for four scientific disciplines and in total.

Table 2-7:
DFG awards to higher education institutions 2002 to 2004 in relation to the total number of professors/scientists and academics (as of 2003) by DFG research area

DFG research area[1)]	DFG awards		Professors		Scientists/ academics total	
	Mio. €		N	K € per prof.	N	K € per scientist
Humanities		284.9	4,111	69.3	12,688	22.5
Social and behavioural sciences		201.2	4,793	42.0	16,934	11.9
Humanities and social sciences		**486.1**	**8,904**	**54.6**	**29,622**	**16.4**
Biology		498.5	998	499.5	5,221	95.5
Medicine		646.1	3,340	193.5	41,040	15.7
Veterinary medicine, agriculture and forestry		79.6	655	121.5	3,179	25.0
Life sciences		**1,224.2**	**4,993**	**245.2**	**49,440**	**24.8**
Chemistry		231.0	905	255.2	5,466	42.3
Physics		306.5	1,115	274.8	6,282	48.8
Mathematics		94.5	1,194	79.1	3,816	24.8
Geosciences		169.6	713	237.9	2,975	57.0
Natural sciences		**801.6**	**3,928**	**204.1**	**18,539**	**43.2**
Mechanical and industrial engineering	203.6	434.2	1,092	397.6	8,936	48.6
Thermal and process engineering	130.5					
Material science and engineering	100.1					
Computer science, electrical and system engineering		234.4	1,431	163.8	8,676	27.0
Construction engineering and architecture		51.6	835	61.8	4,254	12.1
Engineering sciences		**720.1**	**3,358**	**214.5**	**21,865**	**32.9**
No classification possible			**208**		**4,788**	
Total		**3,232.0**	**21,389**	**151.1**	**124,255**	**26.0**

Based on: 84 higher education institutions that received a total of more than half a million euros in DFG awards between 2002 and 2004.

[1)] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, „mechancial and process engineering and materials science".

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

for each research area. The direction of the research also plays a very important role: the DFG is a research funding organisation strongly committed to basic research. Other funding bodies, for example, for projects in which commercial business is involved (see the overview in section 2.4), focus more on industrial applicability.

Finally, some aspects regarding the calculation of grant volume for each institution should be noted:

> Calculations are generally based on individual grant projects and fellowships, for which the grant is awarded to the institution at which the applicant is working at the time of the funding decision.

> Grants awarded to Research Training Groups are generally attributed to the host institution. In exceptional cases, portions of a grant may also be awarded to other institutions participating in these training groups. These exceptions were taken into consideration.

> For Collaborative Research Centres, Priority Programmes and Research Units, individual "projects" are the focus of the analysis. Each project can be assigned to its own research institution (which is standard for Priority Programmes). Grants in these programmes are therefore not explicitly allocated in a lump sum to the host institution. Instead, they are included in the analysis according to the institutional affilia-

tion of the project head and the subject classification of the respective project.

> Information about the involvement of institutions and research areas in DFG Research Centres was calculated based on expenditure accounts providing ex-post information about the on-site distribution of funds (in this case, for the budget years 2002–2004).

2.3.2.4 Direct R&D Project Funding by the German Government

For the first time, it has been possible to integrate data on the research funding activities of the federal government into the 2006 Funding Ranking. According to the analyses by the Federal Statistical Office mentioned above, more than 24% of the third-party funding received by higher education institutions originated from this source (cf. Figure 2-1). The federal government is thus the second largest individual source of third-party funded research at German HEIs, after the DFG.

The report's data on funding from the federal ministries primarily refer to the instrument of direct project funding for R&D projects in the context of specialised funding programmes. The thematic priorities are defined by the direct project funding programmes, which are used as a means to focus the research activities of the respective funding recipients on particular research fields. Also, depending on the allocation of funding resources, different priorities can be set in the individual specialised programmes (cf. ZEW 2003: p. 22). Technology-wide and sector-wide indirect funding and infrastructural funding measures, which are not considered here, also play a significant role in federal research funding activities (cf. BMBF and BMWi 2003: p. 5).

The overall goal of the government's specialised funding programmes is to ensure that, in selected fields, research and development maintain an outstanding level of performance when measured by international standards. This is achieved through the support of R&D projects in which the federal government has a significant interest and with which a high technological or economic risk is associated. Applicants for potential funding must have the necessary expertise and sufficient resources to carry out their projects. A significant proportion of research projects are funded as cooperative projects, in which commercial businesses and/or research institutions work together for the purpose of knowledge or technology transfer (cf. BMBF and BMWi 2001: p. 5).

The 2006 Funding Ranking data are based on the PROFI funding database of the BMBF (cf. excerpts at www.foerderkatalog.de). This database covers most of the direct project funding by the federal government in the civil sector, but does not include direct project funding by some other ministries or certain aspects of their funding activities[19], or direct funding in the military area. The analyses in the Funding Ranking only include "R&D projects" or measures classified as "studies". Accordingly, the general funding of education and science (e.g. projects relating to the establishment of virtual learning networks, of professional patent exploitation systems at higher education institutions or to the financing of competitions for young researchers) is excluded. Furthermore, the financial support of funding bodies (such as the DFG or the AiF) and the administrative funds allocated to the managing research agencies[20] appointed to the various specialised funding programmes are also excluded.[21]

In the study period from 2002 to 2004, the total amount of funding allocated to the recipients described above was €4.4 billion. The percentage of funding provided by the Federal Ministry of Educa-

[19] For example, certain aspects of the funding activities of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) are thus included, although, in some cases, PROFI does not show classifications of the funding priorities and fields.

[20] Managing research agencies are usually large research organisations such as the Helmholtz Association Research Centres, which are contracted by the responsible ministry to supervise a national funding programme.

[21] In addition, two special R&D projects are not included: First, a project run by the Research Centre for Environment and Health (GSF) involving closure of the Asse Research Mine, which was used in research and development work for the safe disposal of radioactive and chemically toxic waste (cf. www.gsf.de/asse). Secondly, the TerraSAR-X project, which involves the construction, testing and launch of an X band SAR satellite for application in the fields of ecology, hydrology, geology, oceanography and interferometry (cf. www.dlr.de/rd/fachprog/eo/terrasar-x). Both projects receive very large investment amounts, directed at infrastructural measures, and are thus atypical for the analysis employed here.

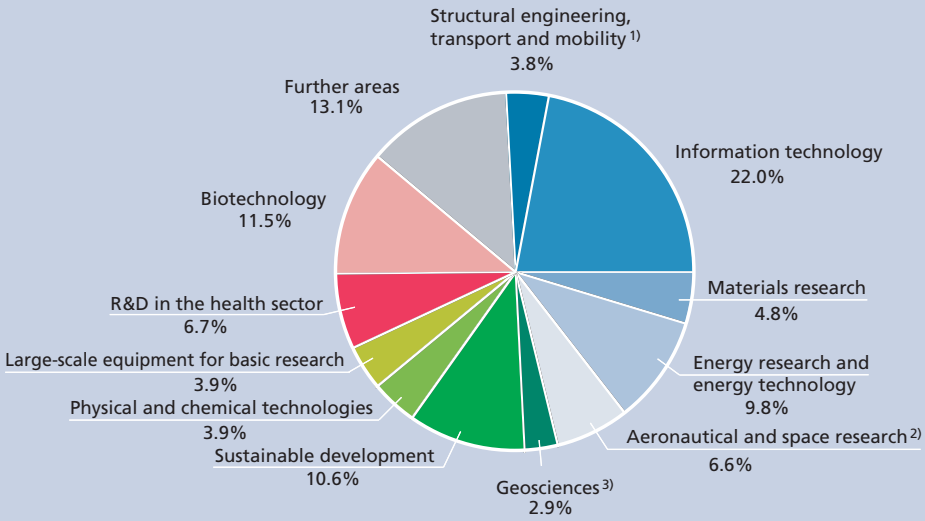
tion and Research (BMBF) was 76%, with 19% coming from the Federal Ministry of Economics and Technology (BMWi), 4% from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and 1% from the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV). The information is presented in condensed form, i. e. the individual funding amounts for one or more projects at a particular research location have been added by the year and assigned to an HEI or research institution where appropriate. The unit of analysis is formed by institutions that have been recorded as "implementing research locations".

Figure 2-2 shows the portion of funding received by the various thematic funding areas (for a schematic overview of the funding categories, please refer to Table A-2 in the appendix). The largest area is "information technology", with a share of 22%. It is followed by "biotechnology" and "sustainable development", with 11% each, and by "energy research and energy technology", with a 10% share. The two funding priorities "aeronautical research and hypersonic technology" and "space research and space technology" have been combined into a single field of research known as "aeronautical and space research", which has a share of 7%, as does the area "R&D in the health sector".

2.3.2.5 R&D Funding in the Sixth EU Framework Programme

More than any other funding initiatives in the European Research Area (ERA), the EU Framework Programmes are responsible for the internationalisation of research. Their most important research objectives include promoting cross-border cooperation and developing international networks of cooperation. In the current Framework Programme (FP6), EU funding targets three areas of activity in particular: focusing and integrating European research, structuring the ERA,

Figure 2-2:
Direct R&D project funding by the German government 2002 to 2004 by thematic funding area (in percent)



1) The "structural engineering, transport and mobility" funding area includes the following categories: "regional planning and urban development; building research" and "research and technology for mobility and transport (including traffic safety)".

2) The "aeronautical and space research" area includes the following categories: "aeronautical research and hypersonic technology" and "space research and space technology".

3) The funding area "geosciences" includes the following funding priorities: "marine and polar research", "geosciences" and "marine technology".

Source:
Federal Ministry of Education and Research (BMBF): Direct R&D project funding by funding priority (based on: PROFI project database; 2002 to 2004).

Calculated by the DFG.

Figure 2-3:
Structure and budget of the Sixth EU Framework Programme: Three main blocks of activities (in million euros)

Block 1: Integrating and strengthening the European Research Area (14,641)

7 thematic priorities

1. Life sciences, genomics and biotechnology for health (2,474)
2. Information society technologies (3,977)
3. Nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices (1,426)
4. Aeronautics and space (1,179)
5. Food quality and safety (753)
6. Sustainable development, global change and ecosystems (2,326)
7. Citizens and governance in a knowledge-based society (247)

Cross-cutting research activities (1,426)

- Research for policy support, new and emerging science and technology (NEST) (608)
- Specific SME activities (471)
- International co-operation activities (345)
- JRC activities (833)

Block 2: Structuring the European Research Area (2,858)

1. Research and Innovation (319)
2. Human resources and mobility (1,733)
3. Research infrastructures (718)
4. Science and Society (88)

Block 3: Strengthening the foundations of the European Research Area (351)

1. Co-ordination of research activities (296)
2. Development of research and innovation policies (55)

Source:
European Liaison Office of the German Research Organisations (KoWi) (2006), Struktur und Übersicht zum 6. EU-Forschungsrahmenprogramm, www.kowi.de/rp/struktur/default.htm (18 August 2006).

and strengthening the foundations of the ERA. Figure 2-3 offers an overview of the general structure of FP6.

The first area of activity will receive special attention in this report. Seven primary research fields are assigned to this group. As shown by the graph, differing amounts of funding were awarded to the individual areas during the course of FP6. Similar to federal project funding, the Framework Programme places an emphasis on "information society technologies", for which almost €4 billion is available. With a budget of €2.5 billion, the area "life sciences, genomics and biotechnology for health" takes second place. In contrast, the social scientific funding area "citizens and governance in a knowledge-based society" received €250 million. With FP6, the EU has made its priorities sufficiently clear. Unlike the DFG, whose goal, as explicitly stated in its statutes, is to fund "all branches of science and the humanities", the EU focuses distinctly on applied research fields.

The analysis of the participation of higher education institutions and non-university research institutions in the current Framework Programme was based on an FP6 project database and carried out in cooperation with the EU Office of the BMBF (DLR managing research agency). This database contains all projects and project participants. The ranking takes into account all data entered prior to 24 January 2006. The Framework Programme runs from 2002 to 2006 and has a budget of approximately €17.5 billion. The data cover allocated and released funds with a total volume of €9.7 billion, so that the data might be considered as a half-time balance.

A total of more than 5,000 contracts have been documented, with over 40,000 scientists and academics from HEIs, non-university research institutions and commercial businesses participating. The general participation pattern shows that German institutions account for 2,407 contracts and 5,940 participations, with a total funding amount of €1,827 million. This corresponds to 19% of the funding allocations included in the half-time balance, as documented in this source. Germany is thus the largest recipient of FP6 funding, followed by the United Kingdom (€1,451 million), France (€1,303 million), Italy (€838 million) and the Netherlands (€627 million).

With regard to the organisational affiliation of participating German institutions, higher education institutions account for almost 33% of all participations and 32% of the total funding volume. According to figures from the Federal Statistical Office, approximately 6% of the third-party funding received by researchers at German HEIs came from international organisations (cf. Figure 2-1). This is predominantly accounted for by research funding from the European Union. EU funds thus contribute a substantial portion of the research funding received by German HEIs. The four large German research organisations receive almost 28% of the funding and account for almost 20% of German participation in FP6. Other research institutions and commercial businesses account for a further 41% of the R&D funding and 47% of the participation (cf. Table 2-10).

2.3.2.6 AiF Funding for R&D

Another novelty of this report is the integration of the funding activities of the AiF (German Federation of Industrial Research Associations). Over 100 industrial research associations with around 50,000 mostly small- and medium-sized enterprises (SMEs) and approximately 700 associated research institutions form the industry-based innovations network of the AiF. Within this structure, the AiF promotes applied research and development for the benefit of SMEs.

The spectrum of funding programmes managed by the AiF ranges from research in the pre-competitive stages for the benefit of entire industrial sectors to the implementation of research findings into commercial practice. The total amount of public funding allocated by the AiF in 2005 was €226 million. The main programmes managed by the AiF are: IGF, which promotes industrial cooperative research by SMEs, and PRO INNO, a federal programme for innovation-competency in medium-sized enterprises, each of which is financed by the BMWi with €100 million; and NEMO, the federal programme for network-management in the new German states, which receives almost €6 million. The AiF is also responsible for allocating funding in FH3, a federal programme for applied research and development at universities of applied sciences, financed by the BMBF with over €10 million. Furthermore, the AiF supports the International Technology Cooperation Network (intec.net).

The ranking's analyses focus on the participation of higher education institutions in IGF programmes. In pre-competitive industrial cooperative research, enterprises from a particular sector or technology area are grouped together in AiF research associations. To be eligible for funding, scientific-technical R&D projects must: be organised in a cross-company manner; yield findings in the area of the development and application of modern technologies; and provide commercial advantages to SMEs. Applications for R&D projects must therefore include the appropriate transfer recommendations and statements on application possibilities and on commercial significance.

The ranking is based on a special report covering about 2,000 industrial cooperative research projects that were either ongoing or completed during the three-year period from 2002 to 2004, with a total volume of approximately €270 million. For aggregate statistics, data were available for 856 research institutions that received public funding to carry out IGF projects during at least one of the three years of the study period. In the three-year period, approximately €107 million in public funding was allocated to IGF projects, carried out at 78 HEIs. With a share of almost 40% of the public funding allocated, the higher education institutions represent a central pillar of the IGF (cf. Table 2-10).

2.3.3 Scientific Expertise and Top-level Researchers

The last ranking included information on DFG reviewers, such as their home institutions and research areas. Reviewers are selected by the DFG on the basis of their outstanding scientific expertise. In terms of the indicators, HEIs and non-university research institutions that employ many of these reviewers can be regarded as locations with high concentrations of expertise. The institutions profit from their good name and acquire a reputation as centres of scientific excellence in the respective research area.

By drawing on other DFG figures, this ranking also considers the significance of this expert knowledge and the outstanding performance of individual researchers. Three indicators have been grouped under the heading "Scientific expertise and top-level researchers":

> DFG review board members: the number of elected members of DFG review boards (2003 election)

> DFG reviewers: the number of researchers who were asked to review (in writing) DFG proposals (based on proposals processed from 2002 to 2004)

> Prizewinners in the Gottfried Wilhelm Leibniz Programme (1986 to 2005)

The following remarks describe the basic characteristics of the three groups and their suitability to achieving the objectives pursued here.

2.3.3.1 DFG Review Board Members

Like almost all research funding bodies worldwide, the DFG calls on experts to help assess funding proposals in a process of peer review. In the case of the DFG, these experts are drawn from two groups: "review board members", who are elected every four years by scientists and academics from HEIs and non-university research institutions, and "reviewers", who take part in the initial stages of peer review and who are selected ad hoc by DFG staff based on their particular expertise.

The DFG peer review system is the only one of its kind. Its main features were put in place by chemistry Nobel prizewinner Fritz Haber, who played an important role in the 1920 founding of the precursor to the DFG, the Notgemeinschaft der Deutschen Wissenschaft, known since 1929 as the Deutsche Forschungsgemeinschaft. When the DFG was re-established in 1951, the main features of this system were adopted and remained largely unchanged until 2002. The main goal of the far-reaching reform, which included process modifications and the restructuring of review committees to review boards, was to reinforce the central role of elected reviewers in the DFG system. This was achieved by extending their influence to all funding programmes (including their participation in peer review panels) and by concentrating their involvement where it has the most effect on the funding decision, i. e. the final evaluation of proposals.[22]

The review boards are anchored in the statutes of the DFG, which were modified in July 2002. The first review board elections took place in the autumn of 2003 for the election period of 2004 to 2007. Approximately 39,000 scientists and academics took part in the election. Out of 1,329 candidates, 577 review board members were elected. At the time of their election, the successful candidates were employed at 71 HEIs (plus two members from HEIs abroad) and 55 non-university research institutions. Tables A-17 and A-18 in the appendix give the number of review board members per HEI and non-university research institution, differentiated according to four scientific disciplines.

2.3.3.2 DFG Reviewers

The DFG's 2003 peer review reform resulted in a clear division of labour between reviewers, who carry out individual reviews, and review board members, who ensure the overall quality of the review process. Reviewers are selected by DFG staff for their expertise in the subject area in question. Both reviewers and review board members participate in peer review panels (especially in the DFG's coordinated programmes and in comparative reviews).

The number of DFG reviewers per institution and research area was already used as an indicator in the 2003 ranking. As a rule, reviewers selected by the DFG are scientists and academics who have made a name in their field. They are often consulted because they have distinguished themselves with one or more DFG projects, or they have been recognised as especially qualified in some other way (publications in renowned journals, prizes received, research stays at leading international institutions, etc.).

The basis of the analyses in chapter 4 is provided by data that have been recorded in the DFG database in the course of processing the proposals by employees

[22] Detailed information on the DFG's peer review reform can be found at www.dfg.de/en/dfg_profile/history/history_of_the_dfg/reform_review_system.html. An in-depth view is offered in Koch 2006.

of the specialist department — primarily to support the automatic generation of form letters (e. g. letters to the reviewers). Only written reviews are included in the base data and not, for example, participation in group reviews, which occur mostly with the coordinated programmes.[23] The statements here refer to proposals that were either approved or rejected in the period between 2002 and 2004.[24] A total of 65,556 reviews of 24,419 proposals, evaluated by 10,883 reviewers, are documented for this period. This corresponds to an average of 2.7 reviews for each proposal. A total of 88% of the reviews were of individual grant proposals (research grants, including publication and printing allowances), and a further 12% can be assigned to the programmes that promote young researchers (research fellowships, Heisenberg Programme and Emmy Noether Programme).

In this analysis, the subject of the reviewer is defined according to the subject area in which the proposal was evaluated. These subjects were aggregated into 14 different research areas in accordance with the DFG's new subject classification system. So-called research area equivalents were calculated[25] for reviewers who were active in several subjects from various research areas. Table 2-11 at the end of this chapter includes information on the number of reviewers per research area and discipline.

The following figures offer a picture of the composition of the reviewers consulted between 2002 and 2004:

> The proportion of scientists and academics working abroad who participated in the written review process during the study period was 13%. This is a significant increase in comparison to the previous report period, 1999 to 2001 (8%). Most of the 1,407 reviewers preparing written evaluations came from Switzerland and Austria; a total of 52% of all DFG reviewers working outside Germany came from these two countries. Scientists working in the USA (12%) come in third, followed by those in the United Kingdom (10%), the Netherlands (8%) and France (5%). A slightly above-average percentage of reviewers working abroad is documented for the life sciences and natural sciences (15% in each case). In the humanities and social sciences the figure is 11%, compared to 8% in the engineering sciences.

> Of the 9,476 reviewers working in Germany (constituting 87% of the total number of reviewers, including private persons), a large majority work at higher education institutions (84%). Those working outside an HEI are primarily active at the institutes of the Max Planck Society (MPG) (4%), the Helmholtz Association (HGF) (3%) and the Leibniz Association (WGL) (2%).[26]

Table A-19 and Table A-20 in the appendix depict the number of reviewers active at HEIs and non-university research institutions according to research area.

2.3.3.3 Prizewinners in the Gottfried Wilhelm Leibniz Programme

The Gottfried Wilhelm Leibniz Prize is Germany's most prestigious research award. It is named after the philosopher, mathematician, physician, historian, theologian, politician, diplomat and scientific organiser — in short, the polymath Gottfried Wilhelm Leibniz, born in Leipzig in the year 1646. The prize has been awarded to approximately 13 laureates annually since 1986. The prize sum amounts to €1.55 million (originally 3 million DM),

[23] Participation in group reviews has only been systematically recorded in the DFG's proposal database since 2005. For that year, the following figures were documented: 7,532 people prepared written reviews only; 1,484 reviewers were also involved in group reviews; and 716 people were exclusively involved in group reviews. Thus, of the 9,732 people involved in reviews, 7% of them were involved exclusively in group reviews. If one assumes a similar distribution for the period of this report (2002 to 2004), then the reviewers who prepared written reviews represent 93% of the total group of people involved in reviews.

[24] The report period primarily covers a time span in which the former system of review committees was still valid; most of the review boards were first constituted between March and May 2004. Many of the people who provided written reviews are elected peer reviewers, with a proportion of approximately 10%.

[25] For example: for a single reviewer who reviewed three proposals in research area A and one proposal in research area B, the result would be 0.75 research area equivalent in A and 0.25 research area equivalent in B.

[26] For technical reasons, statements regarding the host institution of DFG reviewers refer to the most recent address recorded in the DFG database for each reviewer (as of May 2006). No coding of the host institution took place for reviewers from abroad or reviewers with private addresses.

which up to now has been granted for a period of five years.[27] However, it is not only the amount that makes this prize so attractive, but the flexibility allowed in the use of these funds, which can, in principle, be put to any use that demonstrably serves the purpose of research.

In 2005, a "Leibniz Festival" was held to commemorate the 20th anniversary of the prize and honour the 250 previous prizewinners; a Festschrift was published for this occasion, listing the recipients' most important research ideas and including a statistical appendix of the demographic and subject profiles of the prizewinners (DFG 2005: p. 179). To summarise some of the most important results: Leibniz prizewinners come from all scientific disciplines, although in comparison with DFG funding recipients, they have mainly been active in the natural sciences (cf. Table 2-11 at the end of this chapter). Every tenth Leibniz Prize was awarded to a woman — a low proportion which, however, as pointed out in the Festschrift, *"corresponds roughly to the proportion of male and female candidates nominated for the award (out of 1,616 nominees, 154 were women, or 9.5 %)"* (cf. DFG 2005: p. 181). However, in comparison to DFG funding awards, the number of Leibniz prizewinners who, at the time of the award, were conducting research at non-university institutions (18%), particularly at Max Planck institutes (12%), is slightly higher (cf. Table 2-10 at the end of this chapter).

The 250 Leibniz Prizes awarded since 1986 form the basis of calculation in this report. This is a broad enough basis to examine whether, and to what extent, HEIs enjoy a certain prominence as a result of this mark of excellence. However, as with elected review board members, the low number of cases means that a reliable consideration of subject aspects can only be restricted to four scientific disciplines (cf. Table A-21 for HEIs and Table A-22 for non-university research institutions, in the appendix).

[27] In May 2006, the DFG's Joint Committee decided to increase the prize amount to €2.5 million and extend the funding period to seven years, beginning in 2007.

2.3.4 International Appeal

Internationality is an integral part of research, because research does not stop at national borders. Two funding organisations that have, from their inception, made international research networking their goal are the Alexander von Humboldt Foundation (AvH) and the German Academic Exchange Service (DAAD). From a ranking point of view, the figures on funding recipients provided by the two organisations give a good indication of the international prominence and appeal of German HEIs and, in the case of the AvH, of German non-university research institutions, among top-level international scientists and academics. As in the last Funding Ranking, the participation of these two large funding bodies has once more been enlisted, with the aim of obtaining quantitatively reliable information on international appeal, compared by HEI and research area.

The Alexander von Humboldt Foundation, re-established in 1953, funds international cooperation between scientists and academics from other countries and their colleagues in Germany. Within this context, it has developed an international network that now encompasses over 23,000 funding recipients in over 130 countries and is continually growing.

The central funding element is the Humboldt Research Fellowship Programme for postdoctoral researchers from abroad who are generally under the age of 40. The fellowships are awarded in an open international competition, without quotas for academic disciplines or countries of origin. The research fellows are free to choose their research topic and the host with whom they will generally spend between 12 and 24 months working at a German institution. The candidates, only about one-third of whom are granted a fellowship, are selected on the basis of their individual academic qualifications by a selection committee composed of high-calibre scientists. In addition to research fellowships, the AvH also grants research awards to internationally renowned researchers. Rather than a formal application, the prizes are awarded on the basis of nominations by German scientists and academics. The decision by one of these prizewinners to conduct research at a particular German institu-

tion is an indication of the high opinion which a leading international researcher has of the research opportunities at that institution.

During the study period, from 2000 to 2004, the AvH funded 4,338 visiting researchers (3,317 fellows and 1,021 prizewinners). Researchers with several stays at different institutions have a separate entry for each institution visited; numerous visits to the same institution are counted only once. Only research stays of at least three months are taken into account for fellows, with the minimum stay for prizewinners at one month. The research visits are divided between 68 higher education institutions. The 84 HEIs that form the central focus of this report cover more than 99% of the visiting researchers who chose an HEI as their host institution. The scope of the ranking therefore almost completely covers the research institutions favoured by AvH visiting researchers. Table A-23 in the appendix shows the visits for each HEI, differentiated according to 14 research areas.

Like the DFG, the DAAD, which was re-established in 1950, is a membership organisation. The members, upon application, are the HEIs represented in the German Rectors' Conference (HRK) and the student bodies of these institutions. Fellowship funding, with the dedicated goal of "funding young researchers from abroad", represents a main pillar of the DAAD funding portfolio.[28] The fellowships, which are mainly financed by the German Foreign Office and the Federal Ministry for Economic Cooperation and Development, are targeted at students, trainees, doctoral students and researchers. Funding decisions are made by independent selection committees.

During the study period for DAAD data, from 2002 to 2004, the DAAD invested over €230 million in programmes for the "support of individuals", the majority of which went to the students/graduates category (with a total of 35,090 funding recipients, 12,867 of whom were German and 22,223 of whom were fellows from abroad). The analyses in this report are limited to international researchers. This group included 3,601 people in the study period.

In the overall ranking, all funded HEIs are included in the analyses. For technical reasons, however, data provided by the DAAD in relation to research areas and countries of origin are restricted to HEIs that, according to the DAAD's funding report, have received at least €1 million per year. This applies to 51 HEIs with a total of 3,081 funding recipients, which covers approximately 86% of all DAAD visiting researchers (cf. Table A-24 in the appendix).

Table 2-8 shows the most common countries of origin for both the AvH and the DAAD; in the case of the AvH, the figures are differentiated according to fellowship recipients and prizewinners. In the AvH's fellowship programmes, researchers from China, India, the Russian Federation, the USA and Japan are numerically the strongest. With regard to research awards for internationally renowned researchers, nominees from the USA are by far the most successful. They are followed by prizewinners from the countries of the Russian Federation, Israel, Canada, France and Australia. Both findings are quite consistent with the previous ranking. DAAD-related data are also consistent compared to the 2003 ranking: in this case, the Russian Federation and China are the top two countries of origin, followed by Turkey, India, Brazil, Egypt, the Ukraine, the USA and Poland.

2.3.5 Research-related Cooperation Activities and Networks

"Cooperation in networks" is a central metaphor of modern science. The ideal is no longer the individual scientist working in isolation, but rather the research team integrated in multiple national and international, disciplinary and interdisciplinary contexts. The promotion of cooperation in research has been a formative idea for the DFG from the start. It has therefore been evident from very early on, in programmes offered specifically for this purpose. The range of funding opportunities in the DFG's coordinated programmes has been extended and enhanced continually. This process began with the introduction of Priority Programmes in 1953; Research Units

[28] An overview of DAAD funding activities is available at www.daad.de/portrait/en/1.1.html.

in 1962; Collaborative Research Centres in 1968; Research Training Groups in 1991; and the Innovation Research Centres (Innovationskollegs), which ran from 1994 to 2001 and were specifically designed to meet the needs of the former East German states. The process continued with the Humanities Research Centres introduced in 1995 and, most recently, with the DFG Research Centres in 2001. This issue finds renewed significance in the context of the Excellence Initiative. The particular aim of its second line of funding (Clusters of Excellence) is to *"enable German university locations to establish internationally visible and competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions. Clusters of excellence should form an important part of a university's strategic and thematic planning, significantly raise its profile and reflect its considered long-term priorities"* (cf. DFG/WR form ExIn 1e).

The analyses dealing with this topic focus on how, and to what extent, DFG-funded programmes are used for the purpose of inter-institutional cooperation. In terms of ranking, these questions are particularly important: in addition to the intra-institutional research activities that

Table 2-8:
Most frequent countries of origin of AvH and DAAD visiting researchers

Research stays by AvH visiting researchers (2000 to 2004)						DAAD-funded foreign researchers[1] (2002 to 2004)		
Award recipients			Fellows					
Country of origin	N	cum. %	Country of origin	N	cum. %	Country of origin	N	cum. %
USA	456	44.7	China	416	12.5	Russian Federation	290	9.4
Russian Federation	110	55.4	India	341	22.8	China	243	17.3
Israel	65	61.8	Russian Federation	263	30.8	India	103	20.6
Canada	47	66.4	USA	251	38.3	Turkey	103	24.0
France	44	70.7	Japan	169	43.4	Brazil	99	27.2
Australia	42	74.8	Poland	136	47.5	Egypt	97	30.3
Great Britain	38	78.6	France	102	50.6	Ukraine	83	33.0
Japan	34	81.9	Italy	94	53.4	USA	75	35.5
Italy	30	84.8	Spain	86	56.0	Poland	73	37.8
India	15	86.3	Great Britain	76	58.3	Indonesia	70	40.1
Poland	14	87.7	Bulgaria	74	60.5	Argentina	56	41.9
Denmark	10	88.6	Australia	72	62.7	Mongolia	53	43.7
Netherlands	10	89.6	Nigeria	64	64.6	Korea, Republic (South Korea)	52	45.3
Sweden	10	90.6	Hungary	63	66.5	Rumania	50	47.0
Spain	9	91.5	Rumania	61	68.4	Vietnam	50	48.6
Ukraine	9	92.4	Turkey	58	70.1	Mexico	48	50.1
Switzerland	8	93.1	Ukraine	55	71.8	Belarus	47	51.7
China	6	93.7	Canada	50	73.3	Bulgaria	47	53.2
Hungary	6	94.3	Egypt	48	74.7	Cuba	44	54.6
Bulgaria	5	94.8	Serbia and Montenegro	45	76.1	Syria	44	56.1
Czech Republic	5	95.3	Brazil	41	77.3	Uzbekistan	42	57.4
Total	**973**	**95.3**	**Total**	**2,565**	**77.3**	**Total**	**1,769**	**57.4**
Other countries	**48**	**4.7**	**Other countries**	**752**	**22.7**	**Other countries**	**1,312**	**42.6**
Overall total	**1,021**	**100.0**	**Overall total**	**3,317**	**100.0**	**Overall total**	**3,081**	**100.0**
Based on: N countries	**48**		**Based on: N countries**	**111**		**Based on: N countries**	**125**	

[1] Data concerning the countries of origin of DAAD-funded foreign researchers are available for higher education institutions whose total expenditures according to the DAAD funding balance were at least one million euros per annum.

Sources:

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by country of origin (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by country of origin (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

can be determined from various indicators, they offer insight on the success of HEI scientists in integrating partners from neighbouring institutions in joint research projects.

These analyses are based on information about the joint participation of HEIs and non-university research institutions in these programmes. Due to the focus on regional clusters, statements about DFG-funded network formation mostly refer to those programmes that concentrate on cooperation within smaller regions. This applies to Research Centres, Collaborative Research Centres (including Cultural Studies Research Centres and Transfer Units), Research Units and Research Training Groups. Research Centres and Collaborative Research Centres generally apply the "location principle"; in other words, they mainly promote the integration of HEIs and non-university research institutions located nearby or from the same region (apart from intra-university cooperation). Research Units in particular offer a good opportunity for cooperation between different locations, in a network of what is usually a small number of research institutions.

The Priority Programme is excluded from the analysis, although the networking idea is also an integral factor.[29] Here too a large number of institutions are usually involved in a joint programme, but in contrast to the above-mentioned programmes, cooperation normally takes the form of joint workshops, topic-related working groups and colloquia, and not necessarily (or only in small sub-groups) that of jointly undertaken projects.[30]

The institutions and people that are considered to be active in a programme include those institutions that are recorded in the DFG proposal database as applicants, joint applicants or participants (in Collaborative Research Centres and Research Training Groups), individual applicants and co-applicants (mainly in Research Units), participating scientists and academics (lecturers and faculty supervisors at Research Training Groups) and project heads (in Collaborative Research Centres). Also taken into account are cooperation partners, i. e. scientists and academics who are listed as important project participants in the context of the DFG grant (as opposed to personal and institutional applicants), but who do not receive direct funding. Institutions from abroad (for example in International Research Training Groups) and companies (for example in Transfer Units) are not included in the analysis.[31]

The analyses are differentiated according to research area. The area that was assigned during classification of the thematic focus of a coordinated programme (the "framework") was taken as a reference (cf. section 2.2). With the DFG's essentially interdisciplinary coordinated programmes, it is not always easy to classify according to a sole area. The analyses therefore examine cooperative projects that centre around a specific research area, but also include participants from various neighbouring areas.

Table 2-9 shows the extent to which the different DFG funding programmes are included in the analysis. Between 2002 and 2004, the DFG approved 939 coordinated programmes of the types considered here. The largest group is composed of 400 Research Training Groups, followed by over 300 Collaborative Research Centres and almost 200 Research Units (including Clinical Research Units).

Table A-25 in the appendix shows the number of participations in collaborative programmes in which HEIs were involved, differentiated by research area.

Determining the significance of programme involvement is most revealing in the areas of biology, medicine and, to a

[29] The guidelines describe the programme's objective as giving "added value through cooperation between different locations (networking)", whereas "programmes will only be established for topics that receive a significant boost as a result of nationwide networking" (DFG form 1.06e, version 6/05).

[30] Information on the specific goals of the DFG's coordinated programmes and an overview of the projects currently being funded are available at www.dfg.de/en/research_funding/coordinated_programmes. Transregional SFB projects are not included in the analysis.

[31] The method implies that relationships between HEIs and non-university research institutions are also supposed where, for example, a project leader of a Research Unit or a Collaborative Research Centre changes institutional affiliation while a project is still in progress and informs the DFG of this move, thus taking the project with him/her. This mobility-driven form of inter-institutional cooperation is considered equivalent to non-local cooperation from the project's inception.

lesser extent, physics. Whereas in medicine the Collaborative Research Centre is the most popular type of programme, in biology, Research Training Groups and Collaborative Research Centres both play an important role. Research Units are also common in the areas just mentioned, but are just as prevalent in the humanities and the social and behavioural sciences. In the humanities, however, the Research Training Group is the most common type of programme.

The impact of the different programmes on each of the individual research areas offers an initial indication of which form of DFG-funded cooperation is favoured in each case. Collaborative Research Centres and DFG Research Centres focus on intra-institutional cooperation, as well as on cooperation with local non-university research institutions. In contrast, Research Units are in greater demand where joint work on research projects allows or requires partnerships with scientists and academics at non-local institutions. Research Training Groups mostly follow the location principle, but in some cases they also allow the integration of experts working at HEIs or non-university institutions that are further away. As shown by the cooperation networks in chapter 4, this results in very different forms of intra- and inter-institutional, regional and cross-regional cooperation for the different research areas.

2.4 Summary

Twelve indicators are available for this report, seven of which could be differentiated by research area. In addition, the data provided by the BMBF relating to the funding activities of the federal government and data relating to the Sixth EU Framework Programme enable differentiation by eleven and seven funding areas, respectively. The report thus has a solid basis. **The spectrum ranges from third-party funding indicators, to indi-**

Table 2-9:
Number of DFG coordinated programmes from 2002 to 2004 by DFG research area

DFG research area	Total	DFG Research Centres	Research Units[1)]	Research Training Groups	Collaborative Research Centres[2)]
Humanities	115		18	65	32
Social and behavioural sciences	73		17	45	11
Humanities and social sciences	**188**		**35**	**110**	**43**
Biology	155		21	83	51
Medicine	139	2	42	21	74
Veterinary medicine, agriculture and forestry	26		10	11	5
Life sciences	**320**	**2**	**73**	**115**	**130**
Chemistry	69		9	38	22
Physics	104	1	23	41	39
Mathematics	44	1	7	30	6
Geosciences	33	1	8	15	9
Natural Sciences	**250**	**3**	**47**	**124**	**76**
Mechanical and industrial engineering	79		9	20	50
Thermal and process engineering	23		8	2	13
Material science and engineering	18		6	1	11
Computer science, electrical and system engineering	47		9	26	12
Construction engineering and architecture	14		7	2	5
Engineering sciences	**181**		**39**	**51**	**91**
Total	**939**	**5**	**194**	**400**	**340**

[1)] including Clinical Research Units
[2)] including Research Centres and Transfer Units

cators for scientific expertise and excellence, to figures that give information about international appeal and cooperation in research networks. The comparative analysis of these data enables the similarities and differences between the different measurement categories to be worked out: do measurement categories, which can provide a picture of something like "universal" research performance, crystallize out of the multitude of possible indicators? Is it possible to identify subject-specific rules, which should to be taken into account in a discussion of the correct (or even most efficient) form of an indicator-based report on research?

A comparison of the various indicators as a whole results in specific characteristics that should be kept in mind when interpreting the findings presented below. These can be clearly identified with the help of the institutional and thematic orientation of the underlying funding activities. Tables 2-10 and 2-11 show in compact form the extent to which particular research areas or types of institutions participate in, or profit from, the different funding programmes. What conclusions can be drawn in relation to the various indicators?

> When comparing the different third-party funding indicators, DFG awards stand out, as they focus distinctly on HEI research. A total of 89% of DFG grants are awarded to HEIs, most of which are universities. In contrast, according to the data covered by this report, the proportion of funding by the German government, the EU and the AiF awarded to HEIs is between 30% and 40%.

> There is also varying emphasis in relation to non-university research institutions. While the Helmholtz research centres (HGF) participate on a large scale in the Sixth EU Framework Programme — 12% of the funds allocated to German institutions go to HGF research centres — they also receive funding from the federal government (6%), but hardly benefit from DFG awards or AiF funds. Fraunhofer institutes too only participate in DFG programmes to a limited extent, although they have a relatively equal share, from 6% to 7%, in the total funding of all other funding bodies.

> The category "Other institutions (incl. commercial business)" also has a wide range. Due to the objectives outlined in its statutes, the DFG contribution of 3% goes almost exclusively to scientists and academics working at public institutions and non-profit organisations (libraries, museums, hospitals, etc.). However, for the EU and the federal government, this category mainly involves commercial businesses.

The different shares of HEIs and Max Planck institutes, on the one hand, and of business and industry, on the other, give a clear indication of the scientific orientation of the different funding programmes. As a consequence of a strong emphasis on basic research, the DFG focuses mainly on research at higher education institutions. However, the federal government, the EU and above all the AiF are much more oriented towards questions of application and commercial utilisation; hence, the clientele is made up chiefly of industry-related research institutions (cf. Table 2-10).

Considered in this way, even the origin of the funding becomes an indicator: HEIs (and subjects) that focus on the complete spectrum between basic and applied research benefit from both DFG funding opportunities and those offered by other funding bodies. Emphasis on basic research can be deduced from a stronger focus on the DFG, and an orientation towards the immediate commercial utilisation of research can be deduced from a stronger focus on the EU, AiF or federal government.

Various indicators have been used in chapter 4 to compare the DFG's 14 research areas, but in terms of figures on the third-party funding received by higher education institutions, it is only possible to compare DFG awards with the figures for the total income from third-party funding, which have been collected by the Federal Statistical Office and made available for this ranking. The DFG share of this total income is 31%, and most of the rest is divided between commercial business, federal funding and international organisations (cf. Figure 2-1). Where the analysis of general income through third-party funding produces findings that are inconsistent with DFG

funding allocations, this points to the different priorities of the institutional forms just mentioned. In particular, a large part of the income through third-party funding reported to the Federal Statistical Office comes from business, and it can be assumed that these funds are used to promote directly practice-oriented research.

It is quite clear from the information given in this chapter that the significance of third-party funding varies widely from subject to subject. The comparison in Table 2-11 of the two indicators just mentioned, DFG awards and total income from third-party funding according to the Federal Statistical Office, demonstrates this once more in a compact form. The table also illustrates the different weighting given to the research areas by the two sources: for example, in a direct comparison, the humanities are emphasised more by the DFG, but in the total statistics, the social and behavioural sciences have more weight. The differences within the life sciences, between biology and medicine, are even clearer. For the DFG, the shares of biology and medicine are roughly equal, but in the total statistics, the amount of funding allocated to medicine is far greater than that of biology.

At first glance, the question of basic orientation is also relevant here: like medical scientists, social and behavioural scientists (cf. 4.1.2) face a differentiated funding market, because here too, third-party funded studies encounter an application-oriented demand.

On closer examination, however, a methodical problem becomes apparent. From 2002 to 2004, the DFG allocated €590 million for research in biology. However, according to the Federal Statistical Office, the total income from third-party funding in this area from 2001 to 2003 amounted to €511 million. Even if one takes into account the different reporting periods (both of which, however, cover three years), a discrepancy of this size cannot be directly explained. But an explanation offers itself if one considers the different context of origin of these indicators. For the DFG, a project is classified by subject on the basis of its thematic orientation. In the figures reported by the Federal Statistical Office, projects are classified according to the institutional affiliation of the funding recipient. Basic research in biomedicine is therefore frequently classified as biology by the DFG and as medical science by the Federal Statistical Office. The example of Hannover Medical School elucidates this problem: for the Federal Statistical Office, medical science accounts

Table 2-10:
Indicators overview I: Funding shares per institution type

Institution type	Third-party funding income[1]							
	DFG awards		Direct R&D project funding by the German government		R&D funding in FP6		IGF funding from the AiF	
	Mio. €	%	Mio. €	%	Mio. €	%	Mio. €	%
Higher education institutions	3,241.1	88.6	1,359.1	30.8	574.9	31.5	106.8	39.5
Helmholtz Association (HGF)	76.2	2.1	280.4	6.4	219.5	12.0	1.1	0.4
Fraunhofer Society (FhG)	15.9	0.4	316.6	7.2	118.3	6.5	16.4	6.1
Max Planck Society (MPG)	115.0	3.1	134.1	3.0	101.3	5.5	0.2	0.1
Leibniz Association (WGL)	98.0	2.7	139.2	3.2	65.6	3.6	4.0	1.5
Other institutions (including commercial business)	112.4	3.1	2,177.4	49.4	747.2	40.9	141.7	52.5
Total	**3,658.6**	**100.0**	**4,406.8**	**100.0**	**1,826.7**	**100.0**	**270.1**	**100.0**

[1] Excluding funding for institutions and people in other countries

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards by institution type (2002 to 2004).

Federal Ministry for Education and Research (BMBF): Direct R&D project funding by institution type (based on: PROFI project database; 2002 to 2004).

EU Office of the BMBF: German participation in FP6 by institution type (as of 24 January 2006).

German Federation of Industrial Research Associations (AiF): Industrial cooperative research funding by institution type (2002 to 2004).

Calculated by the DFG.

for all of the third-party funding received by this institution, but for the DFG, every fourth allocation goes to a different subject, mostly to one in the life sciences (cf. section 4.2.2). Against this background, income from third-party funding according to the Federal Statistical Office and DFG awards might be used as indicators for specific third-party funding activities. However, they need not be directly related to each other.

Finally, if one considers the programmatic focus of the funding activities of the German government and the EU, it is clear that they give high priority to funding areas in medicine and technology. For sub-sections of biology, to continue the previous example, these organisations offer funding for projects in biotechnology. These priorities have to be taken into consideration when interpreting overall institutional rankings. Indicators based on federal and EU funding are especially significant for HEIs whose profile is characterised by the appropriate subject orientation. They play a minor role, however, where other subjects dominate the research portfolio.

A particular advantage of this ranking is that it is not only concerned with third-party funding, but also integrates other aspects of research funding. Of central importance here are three indicators that are classified together as "scientific expertise and top-level researchers". A glance at their institutional profile shows that their distribution is very similar.

> DFG reviewers, review board members and Leibniz prizewinners can be allocated predominantly to HEIs (with 82% to 88%). The second-largest group are from Max Planck institutes, which are especially well represented among prizewinners at 12% (reviewers and review board members, 4% each).

> The reason that more reviewers from the humanities are consulted than might be expected from the amount of funding allocated to this research area is mainly explained by the fact that a greater number of proposals must be decided on (frequently involving small and sometimes very small amounts of funding, e.g. publication allowances). This applies to a slightly lesser extent to the social and behavioural sciences. In biology and in mechanical and industrial engineering, by contrast, the expertise of a smaller number of reviewers is required for proposals that cost more than the average.

Table 2-10 (continued):
Indicators overview I: Funding shares per institution type

Institution type	Scientific expertise and top-level researchers						International appeal		DFG cooperative research programmes	
	DFG Leibniz prizewinners		DFG review board members[1)]		DFG reviewers[1)]		AvH visiting researchers		Collaborations	
	N	%	N	%	N	%	N	%	N	%
Higher education institutions	206	82.4	503	87.5	7,916	85.8	3,633	83.7	1,672	73.3
Helmholtz Association (HGF)	9	3.6	17	3.0	278	3.0	182	4.2	120	5.3
Fraunhofer Society (FhG)	1	0.4	3	0.5	38	0.4	1	0.0	35	1.5
Max Planck Society (MPG)	29	11.6	24	4.2	344	3.7	413	9.5	193	8.5
Leibniz Association (WGL)	3	1.2	16	2.8	220	2.4	39	0.9	117	5.1
Other institutions (including commercial business)	2	0.8	12	2.1	434	4.7	70	1.6	144	6.3
Total	**250**	**100.0**	**575**	**100.0**	**9,230**	**100.0**	**4,338**	**100.0**	**2,281**	**100.0**

[1)] Excluding private persons and persons working abroad

Sources:

Deutsche Forschungsgemeinschaft (DFG): Participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) (2002 to 2004), Leibniz prizewinners (1986 to 2005) and DFG review board members (2004 to 2007) by institution type.

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by institution type (2000 to 2004).

Calculated by the DFG.

> The number of review board members to be elected is determined roughly by the number and volume of the proposals that are submitted and by their differentiation by research area. It makes more sense to compare the research area distribution of elected review board members with that of reviewers, than to compare it with the subject area distribution of allocated funding amounts. Indeed there is broad agreement between these figures. There are slightly more review board members than reviewers active in the life sciences, and slightly fewer review board members in the natural sciences.

> Only the Leibniz Prize is said to disadvantage social scientists, humanities scholars and engineers. However, the figures presented here dismiss this notion. Whether one compares them with the proportion of the other indicators for "scientific expertise and top-level researchers", or with the proportion of funding allocated, the share for these areas is in keeping with that of other fields. One area that has seldom produced prizewinners is medicine. However, this can be accounted for by the fact that biologists who are active in the area of biomedical basic research have been awarded the prize.

Which research areas are particularly attractive to scientists and academics from abroad? Where has German research made such a contribution that the considerable effort associated with a longer research stay abroad is gladly undertaken?

> As the comparison between the AvH and the DAAD shows, there are various answers to this question. In both cases, the humanities and social sciences are areas that are particularly popular — not only in absolute terms, but also in comparison with the other indicators. The DAAD evidently places special emphasis on them: more than 26% of the DAAD visiting researchers are active in the humanities; at the AvH the figure is 18%.

> On the other hand, German medical research is of below average popularity among visiting researchers funded by the AvH. Only 6% of all researchers visiting from abroad can be allocated to this category in the report period from 2000 to 2004. In the eyes of leading researchers from abroad, however, two areas with a very long and successful research history are at the top of the rank: chemistry and physics. Taken together with the two other natural sciences research areas, almost every second AvH visiting researcher can be allocated to a natural science subject area. This quota is above average, regardless of what other indicators it is compared to. The only nearest comparable situation is found with the Leibniz Prize: it is above all here that scientists and academics visiting from abroad as well as German selection members recognise the outstanding potential of German research.

> The DAAD also funds research visits by prominent scientists, and does so with a clear emphasis on development policy. This is shown primarily by the relatively high proportion of DAAD visiting researchers who are interested in the small research area of veterinary medicine, agriculture and forestry.[32] DAAD funding recipients are represented to a "normal" extent (i. e. in comparison to other indicators) in the areas of chemistry and physics, which are so popular among AvH visiting researchers, and also in biology. Here too, as already seen with AvH visiting researchers, there is less interest in research stays in the engineering sciences.

In contrast to their share of DFG awards, the extent to which non-university research institutions participate in the DFG's coordinated programmes is quite revealing.

> In relation to total figures for participation in coordinated programmes between 2002 and 2004 (2,281 cases of institutional involvement in 939 programmes), non-university research institutions represent a share of 27%. Relative to their share of DFG funding, these institutions have above-average participation in these programmes, which may be attributed in

[32] For more information on the DAAD's strong involvement in the area of development cooperation, please refer to www.daad.de/entwicklung/en.

Table 2-11:
Indicators overview II: Funding shares by DFG research area

DFG research area	Third-party funding income				Scientific expertise and top-level researchers						International appeal				DFG cooperative research programmes					
	DFG awards		Third-party funding income as per Federal Statistical Office[1]		DFG Leibniz prizewinners		DFG review board members		DFG reviewers		AvH visiting researchers		DAAD researchers[2]		Programmes		Institutions[3]		Collaboration	
	Mio. €	%	Mio. €	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Humanities	320.8	8.7	476.0	4.8	32	12.8	78	13.5	1,520	14.0	785	18.1	818	26.5	115	12.2	72	24.3	230	10.1
Social and behavioural sciences	224.3	6.1	811.6	8.3	19	7.6	54	9.4	975	9.0	251	5.8	366	11.9	73	7.8	75	25.3	177	7.8
Humanities and social sciences	**545.0**	**14.8**	**1,287.6**	**13.1**	**51**	**20.4**	**132**	**22.9**	**2,495**	**22.9**	**1,036**	**23.9**	**1,184**	**38.4**	**188**	**20.0**	**106**	**35.8**	**407**	**17.8**
Biology	590.7	16.0	511.1	5.2	57	22.8	72	12.5	1,116	10.3	325	7.5	287	9.3	155	16.5	112	37.8	459	20.1
Medicine	726.7	19.7	2,630.1	26.8	10	4.0	121	21.0	2,332	21.4	260	6.0	172	5.6	139	14.8	99	33.4	373	16.4
Veterinary medicine, agriculture and forestry	91.1	2.5	285.4	2.9	1	0.4	30	5.2	458	4.2	90	2.1	275	8.9	26	2.8	38	12.8	68	3.0
Life sciences	**1,408.6**	**38.2**	**3,426.6**	**34.9**	**68**	**27.2**	**223**	**38.6**	**3,906**	**35.9**	**675**	**15.6**	**734**	**23.8**	**320**	**34.1**	**149**	**50.3**	**900**	**39.5**
Chemistry	261.1	7.1	435.7	4.4	27	10.8	41	7.1	623	5.7	804	18.5	236	7.7	69	7.3	75	25.3	160	7.0
Physics	351.3	9.5	653.3	6.7	33	13.2	29	5.0	823	7.6	881	20.3	198	6.4	104	11.1	97	32.8	257	11.3
Mathematics	102.9	2.8	208.0	2.1	16	6.4	8	1.4	366	3.4	248	5.7	140	4.5	44	4.7	48	16.2	90	3.9
Geosciences	218.9	5.9	298.7	3.0	15	6.0	35	6.1	733	6.7	189	4.4	157	5.1	33	3.5	52	17.6	83	3.6
Natural Sciences	**934.2**	**25.4**	**1,595.7**	**16.3**	**91**	**36.4**	**113**	**19.6**	**2,546**	**23.4**	**2,122**	**48.9**	**731**	**23.7**	**250**	**26.6**	**150**	**50.7**	**590**	**25.9**
Mechanical and industrial engineering	222.9	6.1			20	8.0	23	4.0	275	2.5	87	2.0	155	5.0	79	8.4	65	22.0	153	6.7
Thermal and process engineering	142.6	3.9	1,309.5	13.3	2	0.8	18	3.1	307	2.8	106	2.4	40	1.3	23	2.4	32	10.8	59	2.6
Material science and engineering	120.8	3.3			2	0.8	20	3.5	357	3.3	139	3.2	22	0.7	18	1.9	29	9.8	48	2.1
Computer science, electrical and system engineering	254.6	6.9	720.3	7.3	16	6.4	34	5.9	681	6.3	135	3.1	118	3.8	47	5.0	47	15.9	85	3.7
Construction engineering and architecture	54.1	1.5	346.9	3.5	0	0.0	14	2.4	316	2.9	38	0.9	78	2.5	14	1.5	25	8.4	39	1.7
Engineering sciences	**795.0**	**21.6**	**2,376.8**	**24.2**	**40**	**16.0**	**109**	**18.9**	**1,936**	**17.8**	**505**	**11.6**	**413**	**13.4**	**181**	**19.3**	**106**	**35.8**	**384**	**16.8**
No classification possible			**1,132.0**	**11.5**									**19**	**0.6**						
Total	**3,682.7**	**100.0**	**9,818.6**	**100.0**	**250**	**100.0**	**577**	**100.0**	**10,883**	**100.0**	**4,338**	**100.0**	**3,081**	**100.0**	**939**	**100.0**	**296**	**100.0**	**2,281**	**100.0**

[1] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, "mechancial and process engineering and materials science".

[2] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

[3] As a result of multiple allocations, the percentages do not add up to one hundred.

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) (2002 to 2004), Leibniz prizewinners (1986 to 2005) and DFG review board members (2004 to 2007) by DFG research area.

Federal Statistical Office: Third-party funding income of higher education institutions in total by teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

part to the DFG's guidelines, which explicitly encourage the participation of scientists and academics working at non-university research institutions in coordinated programmes. The non-university research institutions with the highest level of participation are Max Planck institutes (9%). But Helmholtz and Leibniz institutes (5% each) are also well represented, as are institutions with no connection to the four largest research organisations (6%).

> In comparison with the other indicators presented here, the participation rates for biology, medicine and the humanities are noticeably high; the last of these is accounted for by strong participation in Research Training Groups (65 out of 115 programmes).

> The values shown in the "Institutions" column of Table 2-11 feature a specific calculation logic. The number of institutions that participated during the study period (2002 to 2004) in coordinated programmes is specified here for each research area. (Due to multiple allocations, the percentage values do not add up to one hundred.) This number is a measure of the extent of the institutional basis of the research areas in the DFG-funded coordinated programmes. The total number of institutions participating in coordinated programmes amounts to 296, 90 of which are HEIs and 206 non-university research institutions. The quota per research area shows the proportion of this total, which is accounted for by the institutions active in the subject area. Those areas that benefit most from the setup of cross-institutional networks are biology, medicine and physics, each of which represents from 33% to 38% of all institutions taking part in the coordinated research programmes of the DFG. The humanities and social sciences have similarly wide access, as do programmes in the area of industrial engineering.

As both tables show, each of the various indicators points to a different institutional or thematic emphasis. With regard to the report's main focus on HEIs, all of the indicators are informative and the research area quotas generally provide a solid basis for subject-specific observations. Due to the limited number of cases, subject-specific observations of this type are not included for two indicators: neither DFG review board members (577) nor Leibniz prizewinners (250) are present in sufficient numbers to allow a reliable interpretation of their institution or subject origin. These indicators are thus only included in the examination of HEIs as a whole (cf. section 5.2).

3. Research Profiles of Higher Education Institutions and Regions

3.1 Introduction

The indicators presented in the previous chapter, which were developed on the basis of information on the research funding activities of public funding bodies, are used in the following to describe the research profiles of selected higher education institutions. The data are based on figures provided by the DFG, the German government and the European Union (Sixth EU Framework Programme). Together these represent over 80% of all public allocations for research funding at German HEIs (cf. Figure 2-1 in chapter 2). The analysis is in three stages:

- The report first shows the findings drawn from the main indicator, DFG awards, whereby the summarised overview presents the HEI ranking differentiated by the four scientific disciplines, and showing changes over the course of time (i. e. in comparison with earlier rankings).
- This is followed by a graph that visualises, in compact form, the research profiles of the 40 HEIs that received the most funding. It also shows, in relation to DFG awards, to what extent the various research areas are represented at these institutions. The research area profiles arising from the participation of these 40 institutions in the programmes of the EU and the federal government are then presented to provide a comparison.
- This is then followed by an account of the regional distribution of DFG awards, showing in particular which areas of research are most prominent in the different research regions. This is compared to the regional distribution of funds from direct R&D funding by the German government, also according to thematically differentiated funding areas. It can thus be seen how DFG research funding, which is especially focused on HEIs, is related to individual regions and in what overall research contexts, funded by the federal government and consisting to a large extent of commercial institutions, these institutions are active.

With these analyses, the ranking offers a contribution to the discussion on "HEI profiling", which has been predominantly led by the German Rectors' Conference (HRK).[1] Which institutions have similar subject profiles and, in terms of performance profiles, are therefore more comparable than institutions with distinctly different thematic priorities? Beyond the differentiation between technical and non-technical universities, or of institutions with and without a focus on medical research, do further institutional groups emerge that can be said to pursue specific research areas? As the profile analyses enable questions of this type to be answered, new opportunities for strategic institutional alliances arise and unique selling points can be developed. It is then possible to highlight not only the strengths within particular subject

[1] At the conference "Profilbildung an Hochschulen — Grundlage für Qualität und Exzellenz", 30 June 2004, Berlin (see www.hrk.de/de/projekte_und_initiativen/121_2067.php).

and research areas, but also the potential which results from their combination. Institutions that have above-average research activity, for example, in the engineering and natural sciences, or institutions that are strong in biology and in medical research, have different general conditions and requirements than those that concentrate on individual subject areas; for example, when it comes to addressing fields of research on the borders of precisely these subjects.

The analyses presented in chapter 4 of the HEIs that are especially active in the individual subject and research areas of the DFG, the German government, the EU and the German Federation of Industrial Research Associations (AiF), are based on these profile analyses and indicate the inter-relationships between the various areas.

3.2 The 40 HEIs with the Highest DFG Funding

The 40 HEIs with the highest DFG funding are the object of the analyses presented in this chapter. First of all Table 3-1 shows the ranking groups to which these institutions belong in terms of the total data and according to four scientific disciplines. The colour coding shows how, in each case, ten institutions that follow each other sequentially in the ranking are combined into ranking groups. The funding amounts underlying the groups are also shown. They illustrate why it is the ranking group rather than the individual ranking position that should be evaluated when interpreting the order of rank: between one ranking place and the next, the difference in funding is sometimes less than €100,000 in three years. If one takes into account the fact that this amount corresponds roughly to the funding of a single DFG project in the individual grants programme, it can easily be seen that a comparison at the level of individual ranking places is not very useful.

As a result, in the overall view presented in this ranking at the level of HEIs as a whole, the threshold value for a ranking group allocation has been set to exactly €100,000 for all amount-based third-party funding indicators. In the case of DFG funding this means that the second ranking group has a total of eleven institutions (both Frankfurt and Dresden received €66.5 million and take position 20 in the ranking). The third ranking group accordingly contains only nine institutions.

The order of rank is topped by the universities of Munich (U) and Aachen (TH). They received funding amounts (€131 and €126 million) significantly higher than the rest of the leading ranking group — Heidelberg, Würzburg, Berlin (HU), Karlsruhe, Erlangen-Nuremberg, Tübingen, Munich (TU) and Berlin (FU), with amounts between €97 and €105 million. The second ranking group, lead by the universities in Freiburg, Göttingen and Bonn, received funding amounts ranging from €67 to €91 million; the third group, topped by Berlin (TU), Bremen and Hannover (U), includes institutions with funding volumes of from €47 to €64 million; the fourth group, lead by Brunswick, Dortmund and Ulm includes institutions that received amounts from €38 to €46 million.

The HEIs in the first ranking group, as shown by the "cum. %" column (cumulative percent), account for almost one-third of the total funding received by HEIs, and when the top twenty institutions have been added up, the 58% margin has already been reached. The top thirty HEIs received 73% of all DFG awards and, finally, the 40 institutions with the highest funding account for 86%. This shows clearly that the HEIs listed here cover the majority of the research funded by the DFG. Research projects at a total of 154 HEIs were funded by the DFG during the report period.

A first impression of the thematic composition of the funding of these institutions is given in the table by a breakdown of the ranking group allocation into four scientific disciplines (cf. Figure 3-1 for a differentiation by research area and Table A-8 in the appendix for all of the 84 HEIs covered in this report).

It can be seen that the group with the ten most highly funded HEIs owes its special position in most cases to a life sciences-oriented research profile.[2] Sev-

[2] The life sciences also received the largest total share of DFG funding (38%) (based on total HEI funding), the other three areas received between 15% and 25%.

Table 3-1:
Ranking group comparison of higher education institutions with the highest DFG funding volume 2002 to 2004 by scientific discipline

Higher education institution	DFG awards									
	Total		Humanities and social sciences		Life sciences		Natural sciences		Engineering sciences	
	Mio. €	cum. %	Mio. €	cum. %	Mio. €	cum. %	Mio. €	cum. %	Mio. €	cum. %
Munich U	130.8	4.0	26.5	5.4	77.7	6.3	23.4	2.9	3.2	0.4
Aachen TH	126.2	7.9	3.5	6.1	15.0	7.6	19.4	5.3	88.3	12.7
Heidelberg U	105.1	11.2	14.2	9.0	59.8	12.5	27.8	8.8	3.2	13.1
Würzburg U	104.7	14.4	8.2	10.7	81.6	19.1	13.4	10.5	1.5	13.3
Berlin HU	101.5	17.5	20.2	14.8	54.1	23.5	22.5	13.3	4.7	14.0
Karlsruhe TH	100.5	20.6	1.7	15.2	5.2	24.0	40.8	18.3	52.8	21.3
Erlangen-Nuremberg U	100.3	23.7	6.7	16.5	39.7	27.2	22.9	21.2	31.1	25.6
Tübingen U	99.7	26.8	24.9	21.6	52.4	31.5	17.9	23.4	4.5	26.2
Munich TU	99.3	29.9	1.7	21.9	38.7	34.6	25.2	26.6	33.7	30.8
Berlin FU	96.6	32.8	25.6	27.2	39.9	37.9	27.8	30.0	3.3	31.3
Freiburg U	91.1	35.7	12.5	29.7	55.9	42.5	17.6	32.2	5.0	32.0
Göttingen U	85.1	38.3	8.8	31.5	53.6	46.8	20.7	34.8	2.0	32.3
Bonn U	81.9	40.8	13.4	34.2	40.2	50.1	25.2	37.9	3.2	32.7
Stuttgart U	79.1	43.3	4.4	35.1	5.4	50.6	16.5	40.0	52.8	40.0
Münster U	73.5	45.5	16.8	38.6	30.8	53.1	24.7	43.1	1.2	40.1
Bochum U	73.3	47.8	10.0	40.6	21.0	54.8	20.9	45.7	21.4	43.1
Hamburg U	72.1	50.0	15.7	43.8	28.4	57.1	26.6	49.0	1.4	43.3
Cologne U	70.7	52.2	16.9	47.3	31.8	59.7	19.5	51.4	2.5	43.6
Mainz U	69.2	54.3	8.9	49.1	38.1	62.8	21.6	54.1	0.5	43.7
Frankfurt/Main U	66.5	56.4	20.2	53.2	31.9	65.4	13.3	55.7	1.0	43.8
Dresden TU	66.5	58.4	7.6	54.8	6.8	66.0	17.4	57.9	34.7	48.6
Berlin TU	63.6	60.4	4.8	55.8	5.6	66.4	23.9	60.9	29.3	52.7
Bremen U	62.2	62.3	6.6	57.1	2.0	66.6	32.1	64.9	21.5	55.7
Hannover U	60.2	64.2	1.4	57.4	5.8	67.1	17.4	67.0	35.7	60.6
Darmstadt TU	53.8	65.8	2.4	57.9	4.9	67.5	11.0	68.4	35.5	65.5
Giessen U	50.4	67.4	11.5	60.2	33.4	70.2	5.4	69.1	0.0	65.5
Marburg U	50.3	68.9	7.8	61.8	32.1	72.8	9.2	70.2	1.2	65.7
Duisburg-Essen U	49.7	70.5	4.8	62.8	14.8	74.0	20.6	72.8	9.5	67.0
Düsseldorf U	49.0	72.0	6.1	64.0	34.4	76.8	7.4	73.7	1.2	67.1
Jena U	46.8	73.4	13.9	66.9	16.0	78.2	13.5	75.4	3.4	67.6
Brunswick TU	45.9	74.8	1.5	67.2	7.2	78.7	4.9	76.0	32.3	72.1
Dortmund U	45.8	76.2	3.9	68.0	0.8	78.8	9.0	77.1	32.0	76.5
Ulm U	44.5	77.6	0.5	68.1	29.8	81.2	9.2	78.3	5.0	77.2
Constance U	43.7	79.0	18.2	71.8	10.8	82.1	13.6	80.0	1.1	77.3
Halle-Wittenberg U	41.3	80.2	8.5	73.5	20.3	83.8	10.2	81.3	2.2	77.6
Kiel U	41.0	81.5	5.5	74.6	17.8	85.2	14.5	83.1	3.3	78.1
Regensburg U	40.0	82.7	5.0	75.6	22.3	87.1	12.5	84.6	0.2	78.1
Bielefeld U	40.0	84.0	16.3	79.0	9.7	87.9	9.9	85.8	4.1	78.7
Saarbrücken U	39.3	85.2	8.1	80.6	15.4	89.1	7.0	86.7	8.8	79.9
Leipzig U	38.4	86.4	9.5	82.6	13.2	90.2	12.5	88.3	3.3	80.4
Top 40 in total	**2,799.3**	**86.4**	**404.5**	**82.6**	**1,104.8**	**90.2**	**708.7**	**88.3**	**581.4**	**80.4**
Other HEIs	**441.8**	**13.6**	**85.5**	**17.4**	**120.2**	**9.8**	**94.2**	**11.7**	**141.9**	**19.6**
HEIs in total	**3,241.1**	**100.0**	**490.0**	**100.0**	**1,225.0**	**100.0**	**802.9**	**100.0**	**723.3**	**100.0**
Based on: N HEIs	**154**		**116**		**74**		**81**		**106**	

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 to 40	41 and other

Abbreviations:
FU = Free University; HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

en of the ten highest-placed HEIs are also among the ten most DFG active institutions in this area. The University of Munich acquires 60% of its awards through projects in this area, and, as shown by Figure 3-1, these funds are divided in roughly equal parts between biology and medicine. In Würzburg, over 80% of the funding is accounted for by these two research areas; the main emphasis, however, is on medicine.

Among the ten leading institutions, there are also four universities with a technical focus — especially pronounced at the Technical University of Aachen, which received 70% of its awards for research projects in the engineering sciences, thus leading the field in this scientific discipline. In Erlangen-Nuremberg, the life sciences and engineering sciences have more or less equal weight. Karlsruhe supplements its main focus on the engineering sciences with a large amount of funding for research in the natural sciences. Four additional institutions in the first ranking group also owe their special position to a large extent to funding allocated in the natural sciences (Munich (U), Heidelberg, Munich (TU) and Berlin (FU)).

As for the humanities and social sciences, it may also be seen that four of the ten most funded institutions — Munich (U), Berlin (HU), Tübingen (U) and Berlin (FU) — also owe their special position to the DFG-funded research activities of their scientists and academics working in this area. At the University of Munich, which is at the top of the ranking list, and at Tübingen, the amount of DFG funding in the humanities and social sciences exceeds even the amount received in the natural sciences; at the two universities in Berlin, it is only just under that amount.

A wider view shows that the twenty highest-funded HEIs not only include the ten leading institutions in the life sciences, but also eight of the ten leading institutions in the natural sciences and in the humanities and social sciences and, finally, six of the ten leading institutions in engineering sciences research. In the humanities and social sciences, the two smaller universities in Bielefeld and Constance, which focus heavily on this area, are missing from this group; in the natural sciences, it is the TU Berlin and the University of Bremen that are missing, although they lead the third ranking group in positions 22 and 23. In the engineering sciences, finally, the technical universities in Hannover, Darmstadt and Brunswick, and the University of Dortmund, although outside the top 20, are among the leaders of the field.

The HEIs shown in the table therefore include not only the most highly funded institutions, but also those which are the most active in terms of funding in the four scientific disciplines.

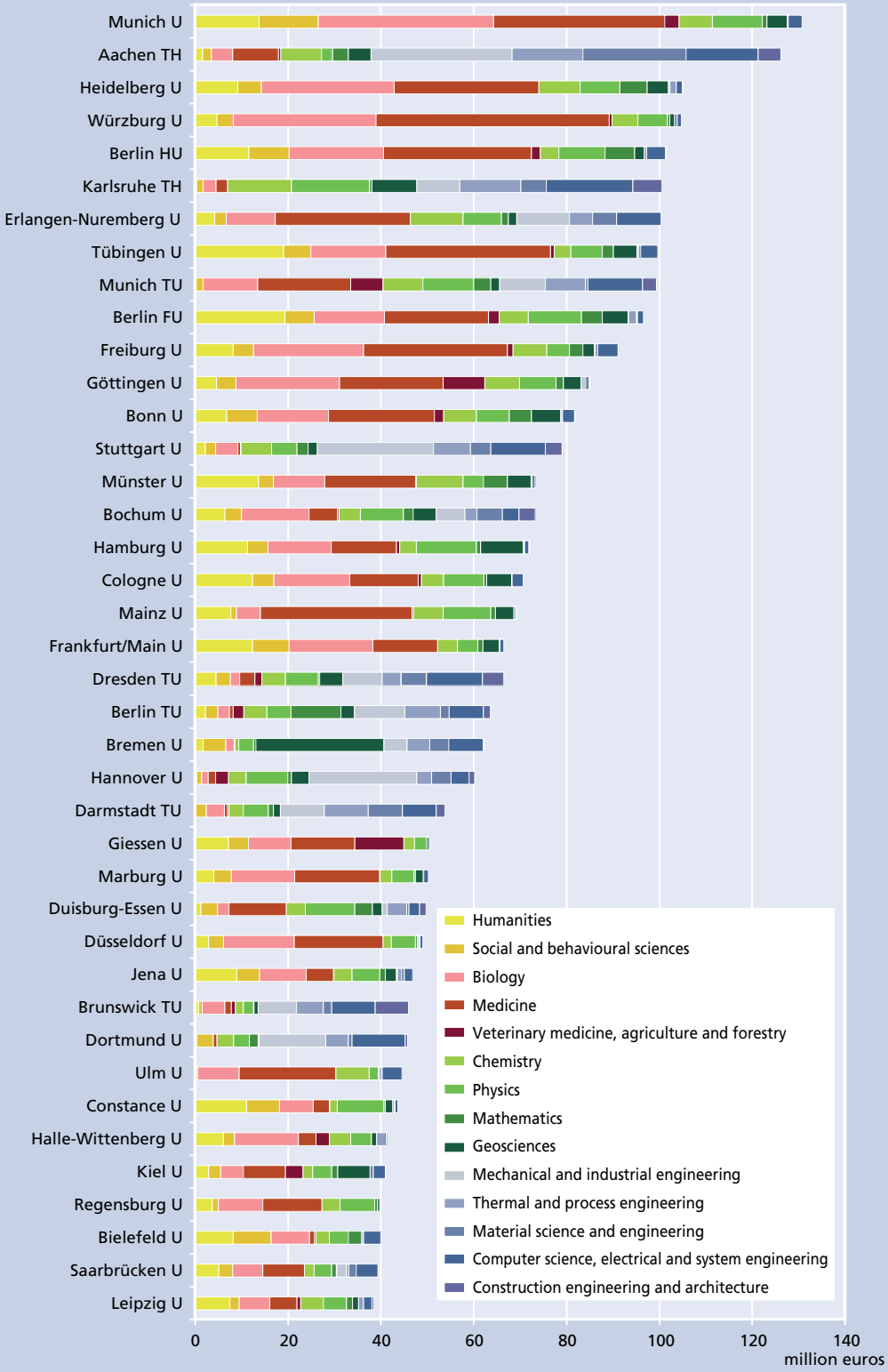
Figure 3-1 shows once more, in the form of a graph, the DFG funding allocated to the 40 HEIs that comprise the main focus of the study, differentiated in this case by 14 research areas. Along with the various emphases on different research areas, which are examined in more detail in the next chapter, this graph once more clearly illustrates on what small differences, in terms of amounts of DFG funding received, the ranking positions are based.

3.3 The Development of Ranking Group Allocations Over Time

With regard to the ranking group allocation of the institutions considered here, what changes have taken place over time? The first DFG Funding Ranking appeared in 1997, and referred to the report period 1991 to 1995. The 2006 Funding Ranking covers the period up to 2004. The four reports published so far thus account for a period of 14 years (cf. Table 3-2).

With a view to this time period, it must first be noted that the ranking groups have remained very stable, although changes for individual institutions do exist. Of particular interest are the leading institutions in ranks 1 to 10: six HEIs in this category have changed ranking groups during the 14-year period. Würzburg, the highest-placed of these universities, and also HU Berlin have managed to climb gradually out of the second and third ranking groups into the top 5. Erlangen-Nuremberg has moved from thirteenth to seventh place, and TH Karlsruhe has improved from fourteenth to sixth place. Tübingen has been one of the ten HEIs with the highest DFG funding since the second ranking, as has HU Berlin, which, like all HEIs in the former East German states, was consider-

Figure 3-1:
DFG awards 2002 to 2004 by higher education institution and research area



Abbreviations: FU = Free University; HU = Humboldt University; TU/TH = University of Technology; U = University

ably affected by restructuring measures at the time of the first ranking. Finally, the FU Berlin, among the leaders in the first ranking, is once more in the top group in the current report.

A continuous "climber" in the second ranking group is the University of Münster, and the TU Dresden has also improved noticeably over time to reach the top 20 in the current ranking. Stuttgart, which up to the last ranking had always been one of the ten HEIs with the highest funding, has fallen somewhat behind — as a result, among other things, of the phasing-out of some large Collaborative Research Centres.

In the third ranking group, the University of Bremen has steadily improved its position; it is currently ranked 23rd and therefore just steps away from the twenty institutions with the largest funding amounts. The University of Jena has shown a similar development, moving from 42nd to 30th place. However, the TU Berlin, currently at the top of the third ranking group, has gradually moved down the field since the first ranking.

After the HU Berlin, the TU Dresden and the University of Jena, mentioned above, another eastern German university has also continually increased its funding allocations since the early 1990s: the University of Halle-Wittenberg, currently ranked in the fourth group. The positions of Bielefeld and Saarbrücken, in contrast, show a downward tendency.

As already stressed above, in some cases, it is only a few thousand euros which separate the different ranking positions. The phase-out of a single Collaborative Research Centre, which generally last for 12 years, is often sufficient to cause a much larger temporary fall in third-party funding. Analysis shows that corresponding leaps in the order of rank occur again and again. Trends that describe long-term developments are therefore far more revealing. Changes from one ranking to the next present transitory views at best.

Reference is also made here to findings resulting from the comparison of the various indicators (section 4.5 and section 5.2). They show that institutions that have relatively low DFG funding allocations and/or those that exhibit downward trends over the short- or long-term in relation to DFG funding, elsewhere have higher-than-average success, for example, with the EU or the federal government.

3.4 The Funding and Research Profiles of HEIs

The analyses above have already given an initial impression of the thematic profiles of the 40 institutions with the highest funding allocations. The illustrations that follow allow a more substantial consideration. The following data are utilised for this purpose:

- DFG awards, differentiated by 14 research areas (2002 to 2004)
- Direct R&D project funding by the German government, differentiated by 11 funding areas (2002 to 2004)
- R&D funding in the Sixth EU Framework Programme, differentiated by 7 funding areas (report status: January 2006)

In anticipation of the research area- and funding area-related individual accounts that follow in chapter 4, these analyses offer an impression of the priorities and relative weighting applied by these institutions to different research areas. They thereby help in identifying the similarities and differences in the funding profiles of these research institutions.

This analysis is supported by graphs and the basic method was developed at the Max Planck Institute for the Study of Societies.[3] The graphs, which were developed on the basis of algorithmic calculations, enable the research area- or funding area-specific profile of each institution to be described and compared. The research or funding areas are presented in different colours that indicate which of the four scientific disciplines of the DFG they belong to (humanities and social sciences, life sciences, natural sciences and engineering sciences). **The size of the individual research area symbol indicates the funding volume associated with that particular subject, and the size of the institutional symbol represents the total funding volume associ-**

[3] A comprehensive description of this method is given in Krempel 2005.

Table 3-2:
Comparison of the rankings of the 40 higher education institutions with the highest DFG funding volume 2002 to 2004 by reporting period

Higher education institution	Report period			
	1991–1995	1996–1998	1999–2001	2002–2004
Munich U	2	1	2	1
Aachen TH	1	2	1	2
Heidelberg U	4	4	6	3
Würzburg U	14	10	8	4
Berlin HU	29	9	9	5
Karlsruhe TH	6	14	10	6
Erlangen-Nuremberg U	13	8	5	7
Tübingen U	12	6	4	8
Munich TU	3	3	3	9
Berlin FU	5	13	13	10
Freiburg U	10	15	11	11
Göttingen U	8	11	15	12
Bonn U	15	12	12	13
Stuttgart U	7	5	7	14
Münster U	25	23	19	15
Bochum U	11	20	17	16
Hamburg U[1)]	17	7	14	17
Cologne U	21	19	16	18
Mainz U	18	17	22	19
Frankfurt/Main U[2)]	19	25	18	20
Dresden TU[2)]	35	24	24	20
Berlin TU	9	16	20	22
Bremen U	32	31	28	23
Hannover U	16	21	21	24
Darmstadt TU	26	22	25	25
Giessen U	30	32	26	26
Marburg U	20	18	23	27
Duisburg-Essen U[3)]	–	–	–	28
Düsseldorf U	27	26	27	29
Jena U	42	35	32	30
Brunswick TU	23	28	33	31
Dortmund U	38	37	30	32
Ulm U	36	34	37	33
Constance U	28	30	29	34
Halle-Wittenberg U	44	39	38	35
Kiel U	22	27	36	36
Regensburg U	41	40	39	37
Bielefeld U	24	29	31	38
Saarbrücken U	31	33	35	39
Leipzig U	40	38	34	40

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 to 40	41 and other

Abbreviations:

FU = Free University; HU = Humboldt University; TU/TH = University of Technology;
U = University

[1)] The 1996-1998 reporting period included central research facilities, such as the research vessel METEOR, whose control centre is located at the University of Hamburg.

[2)] The University of Frankfurt/Main and TU Dresden ranked equally in the current report. Therefore, the second ranking group includes 11 higher education institutions and the third group includes 9.

[3)] The universities of Essen and Duisburg merged in early 2003 and were thus reported on separately during the previous reporting periods.

ated with the particular institution. The specialisations of an individual HEI are indicated in the diagram by a proximity to the symbol of the research or funding area that accounts for a large proportion of the funding received from a particular funding body.

In spite of the complex multidimensional procedure, the simultaneous algorithmic treatment of the funding allocations for research areas and the corresponding funding profiles of the HEIs produce two-dimensional arrangements, with which both the funding allocated to the research areas (differentiated by recipients) and the relative specialisations of the institutions can be evaluated. The distance at which the symbols for research and funding areas are placed is determined by the overlap that exists between the funding recipients in these areas; institutions are placed next to each other if they have similar profiles. The subjects that determine these profiles can be read from the pie charts of the respective institutions.

3.4.1 Thematic Profiles of HEIs, Based on DFG Awards

On the basis of the method described above, Figure 3-2 shows how the research profiles of the 40 main DFG funding recipients turn out when the funding allocations are broken down into 14 research areas.

The range of subjects extends from the technical subjects at the left-hand side of the diagram, to the humanities and social and behavioural sciences (top-right), to the life science subjects at the bottom-right. The natural science subjects, especially physics and mathematics, are placed in the centre. From this arrangement, it is possible to draw the conclusion that DFG funding in these two areas is an important element not only for technically inclined HEIs, but also for life sciences and humanities and social science-oriented HEIs. As classic basic research subjects, physics and mathematics characterise the research of institutions with very different general orientations.

Furthermore, it is evident from the diagram that on the whole there is great variety in the profiles of these institutions: each HEI sets its own priorities, even if there are large similarities between certain individual institutions.

From the diameter of the research area symbols, it is possible to read the proportion of DFG-funded research allocated to the 40 most funded HEIs. The research area that receives the most funding from the DFG is medicine, immediately followed by biology, which is shown in the diagram with many institutions in close proximity. The main funding recipients, in keeping with the tables presented above (cf. Table 3-1 and Figure 3-1), are the universities in Munich (U), Aachen, Heidelberg, Würzburg, and Berlin (HU).

A glance at the individual institutions sheds light on the question of specific profiles; the breakdown of DFG third-party funding allocations into different research areas reveals certain "elective affinities". The universities of Karlsruhe and Hannover, to single out one example, resemble each other in more than the fact that they are both technical universities with a corresponding emphasis on mechanical engineering-related subjects. In both cases, the natural sciences, especially physics and geography, are also strongly represented. In Darmstadt and Dortmund, on the other hand, the natural sciences have a merely average importance when compared to the 40 institutions, and the emphasis here is placed instead on the areas of "computer science, electrical and system engineering" and "thermal and process engineering". This also applies to Stuttgart, where a large share of DFG funding is used, as in Darmstadt, Aachen, Hannover and Dortmund, for industrial engineering projects. Aachen, Darmstadt and Dresden are arranged in the diagram around "material science and engineering", because this research area is also an important element in the profile of these three technical universities.

The TU Munich has a profile that is clearly differentiated from these technical universities. Mechanical and process engineering, electrical engineering, computer science and system engineering also play an important role here. As in Erlangen-Nuremberg these special areas are supplemented by research in biology and medicine, which are largely absent from the above-mentioned universities, and research in chemistry is also more prominent here than at many other institutions. If one wanders, so to speak, further through this "profile landscape", the

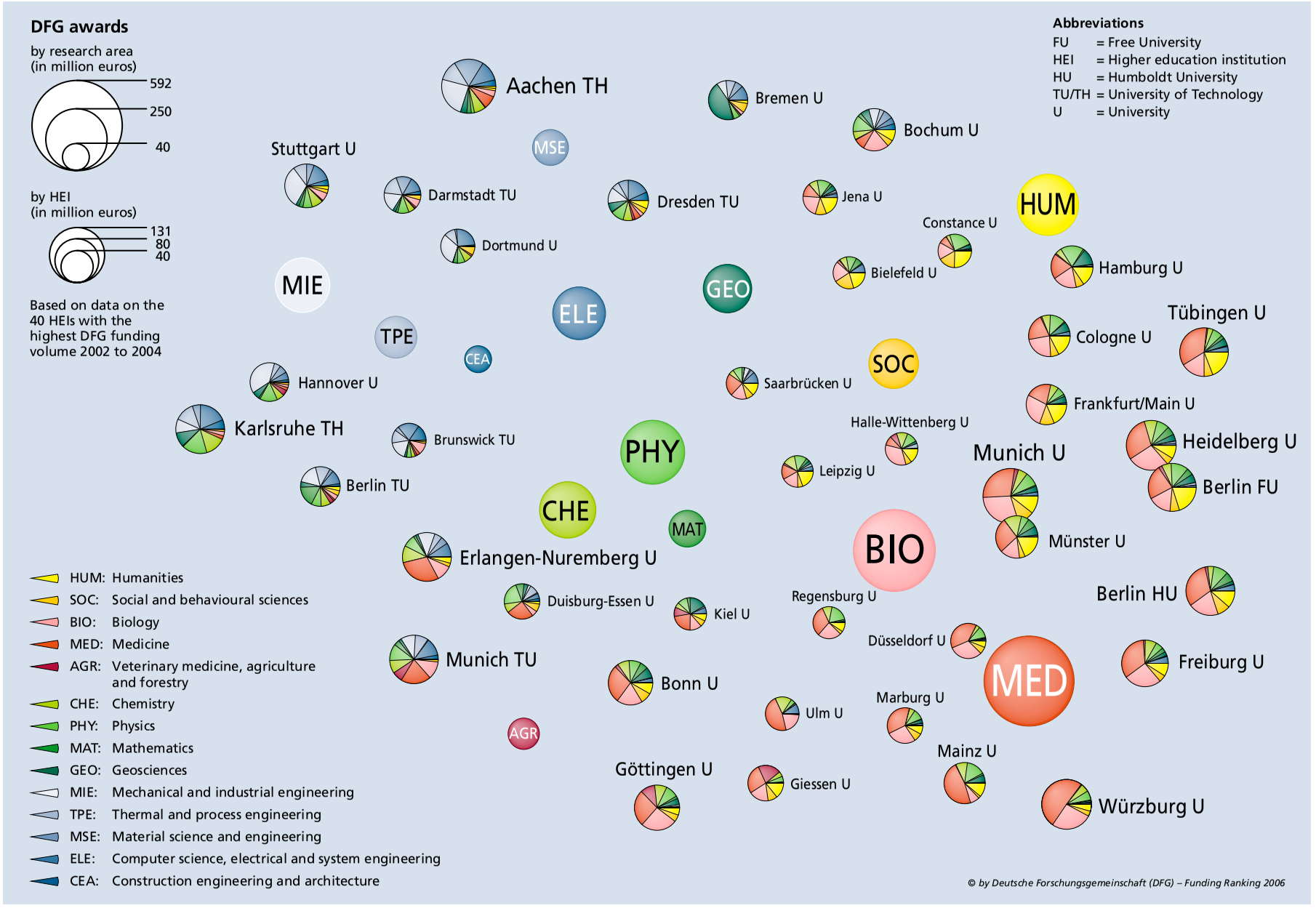


Figure 3-2:
Funding profile of higher education institutions based on DFG awards in 14 research areas

universities of Göttingen and Giessen are found at the bottom of the image. Like many other institutions, they are characterised by a high proportion of biological research, but they also feature a strong emphasis on the area of "veterinary medicine, agriculture and forestry".

Munich (U) and Münster are also alike insofar as they carry out DFG research in both medicine and biology, and at the same time offer plenty of space to the natural sciences and the humanities and social sciences, whereas, in contrast to the HEIs located on the left-hand side of the graph, they have hardly any involvement in the engineering sciences.

The universities of Constance and Bielefeld, located higher up on the graph, concentrate noticeably on the humanities and the social and behavioural sciences, although the life sciences and natural sciences also have a high proportion in both their profiles.

The profile of Bremen is quite unique. The focus of DFG funding here is on the geosciences — combined with an orientation towards subjects belonging to the engineering sciences and an emphasis on research in the social and behavioural sciences. The complete profile of Bremen is therefore different from that of the second most important geosciences university, Kiel, which is found near the bottom of the image, as a result of its additional life sciences orientation.

As shown by these few examples, the result on the whole is a highly differentiated picture of the subject profiles of the institutions presented here. Although many of these institutions follow the "all-rounder university" model, each one sets different priorities. On the other hand, despite all the differences, large similarities can be discerned among the institutions clustered around particular research areas. The range of these profiles is broad, as is demonstrated graphically by the image. But just as impressive is the common ground between the HEIs located in each region of this "profile map".

3.4.2 Thematic Profile of HEIs, Based on Direct R&D Funding by the German Government

Federal government funding is divided into numerous funding priorities, which have been grouped into 11 funding areas (plus the "Further" category) for the purpose of this report (cf. section 2.2.2). Figure 3-3 illustrates the extent to which these funding areas feature in the research profiles of the 40 largest DFG funding recipients.

As shown in chapter 2, 30% of the direct R&D project funding by the German government during the study period is allocated to higher education institutions. A total of 78% of this sum went to the 40 HEIs that received the most DFG funding. The amount of federal government funding received by these institutions in the three years from 2002 to 2004 is over €1 billion. That means that a solid base data is available for the following profile comparison.

The highest total amount from the federal government for R&D projects was received by the TU Munich, followed by the universities of Aachen, Stuttgart, Dresden and Munich (U). For the 40 HEIs covered in this study, funding amounts range from €61 million (TU Munich) to €3.5 million (University of Constance) (cf. Table A-15 in the appendix).[4]

Institutions have varying levels of participation in the different federal funding programmes. They participate strongly in the funding provided for "large-scale equipment" and in the area "R&D in the health sector", and to an average extent in the areas of "biotechnology", "geosciences", "physical and chemical technologies" and "sustainable development". They profit to a lesser extent from engineering sciences-oriented third-party funding, which is allocated by the federal government in the areas of "energy research and energy technology", "information technology", "structural engineering, transport and mobility", "aeronautical and space research" and "materials research". Although the budget for R&D projects in the area of information technology accounts for more than 20% of the entire federal funding volume considered here, it covers only about 10% of the funds that HEIs received from the federal government.

[4] It should be noted that these values can be compared to the above DFG funding allocations only in a limited sense, because these figures refer specifically to annual incomes, whereas the DFG figures refer to funding allocations that were granted in the same year though intended to last for several years.

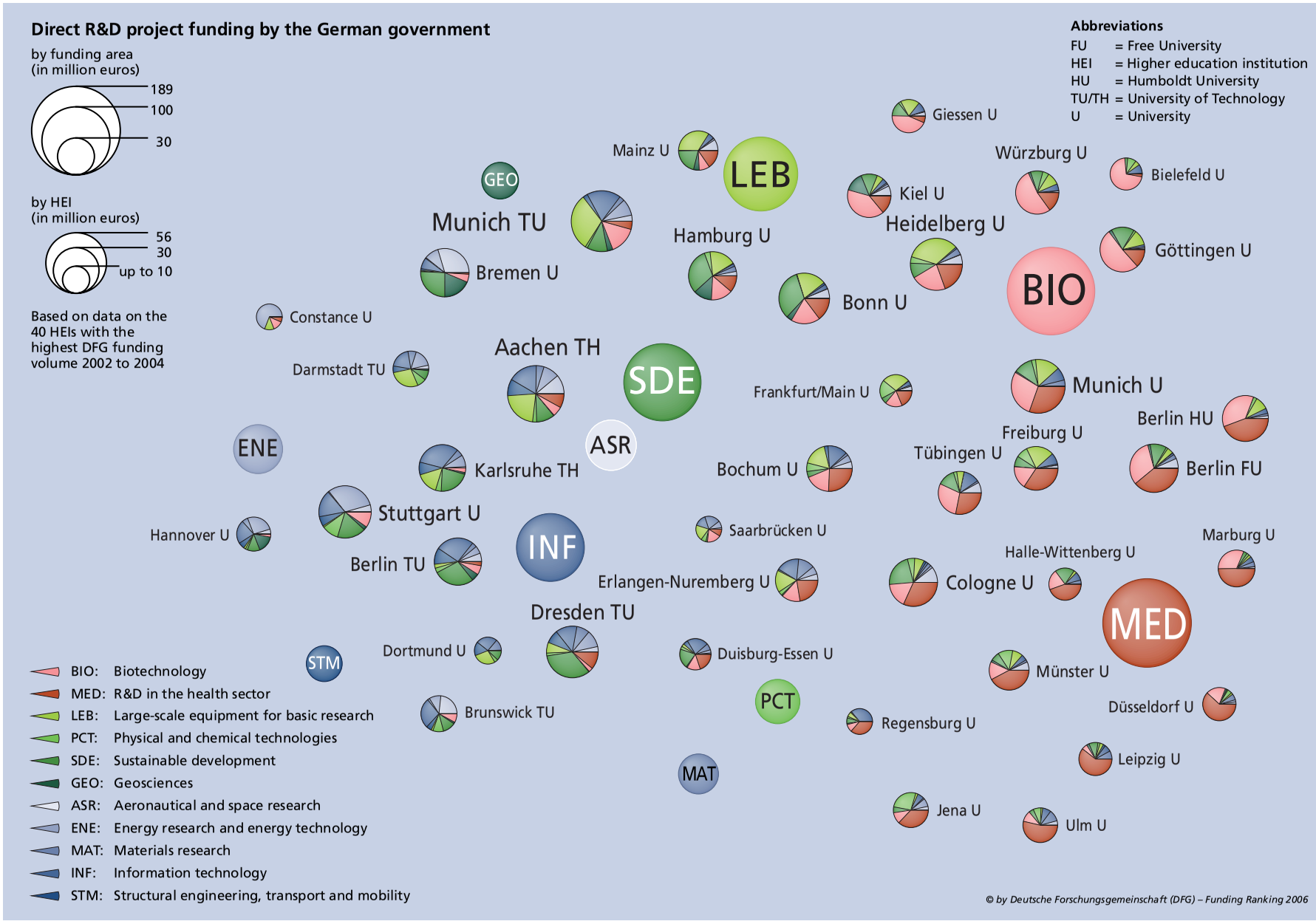


Figure 3-3:
Funding profile of higher education institutions based on direct R&D project funding by the German government in 11 thematic funding areas

As in the illustration shown above, but here in relation to federal funding, a whole spectrum of funding profiles extends from the technically oriented funding priorities at the left of the graph, to areas with a strong focus on natural science, to research in the life sciences (cf. Figure 3-3). The latter are divided into a group of HEIs at the top right, whose federally funded activities are focused on biotechnology research and a group at the bottom right who have received high funding amounts in the area of "R&D in the health sector".[5]

Institutions with a stronger emphasis on biotechnology research include the universities in Göttingen, Würzburg, Munich (U) and Kiel, as well as the FU and HU Berlin. As with the first two of these universities, about half of the federal R&D funding received by Giessen and Bielefeld was for biotechnology research. As regards federal funding, the universities mentioned thus form the core of a "biotechnology cluster".

The universities in Düsseldorf, Ulm, Marburg and Leipzig are more focused on medicine; they received around half (Düsseldorf: 62%) of their federal funding for research in the category "R&D in the health sector". As might be expected, there is some overlapping with the cluster described above, for example in the FU and HU Berlin, which carry out federally funded projects in both funding lines at the jointly run Charité University Mecical Centre. The universities in Freiburg, Tübingen, Cologne, Bochum, Erlangen-Nuremberg, Frankfurt, Heidelberg, Regensburg and Bonn also received a substantial proportion of their federal funding in this area.

With a total volume of €127 million, the 40 institutions considered here account for about 73% of the federal funding provided for relevant research in the area of "large-scale equipment for basic research". This funding area includes, among other things, the following funding priorities: research into condensed matter, the structure and interaction of elementary particles and research in mathematics, astrophysics, hadron physics, and nuclear physics. "Large-scale equipment for basic research" is thus a funding area that can be assigned primarily to the natural sciences and above all to physics.

During the study period, the University of Heidelberg received a large share (34%) of the federal funding in this category. With shares of over 20%, research in this funding area is also an important element in the profiles of Munich (TU), Mainz, Darmstadt, Dortmund, Frankfurt and Aachen — universities which also have a natural science-oriented profile in terms of DFG funding.

The research area "sustainable development" is composed of heterogeneous subjects. This thematic funding area consists of the research fields "global change" (especially climate, atmospheric and biosphere research), "socio-ecological research and regional sustainability" (e.g. R&D projects for environment-related infrastructural development or for the sustainable use of natural resources) and "sustainable production and cleaner environmental technology" (e.g. R&D in the area of raw material-related production systems or integrated environmental protection). Funding in this area is an important element in the profiles of the universities in Bonn, Hamburg, Bremen, Dresden, Stuttgart and Berlin (TU). A closer examination of the funding received by the participating institutions reveals that they each concentrate on their own priorities in this funding area, on research oriented, for example, towards the natural sciences, the geosciences or the engineering sciences. As this funding area is served by HEIs with widely varying subject orientations, the algorithm underlying this presentation places it in the centre of the graph.

The institutions that cover the technical areas can be found on the left-hand side of the graph. Information technology is the largest funding area supported by the federal government. From 2002 to 2004, almost €970 million was provided for this type of research in the context of the direct R&D project funding under consideration here. However, only 11% of this amount, a total of €105 million, went to the institutions taken into account here (with 15% going to HEIs in general). With relative shares of between 25% and 30% of the total federal funding received in each case, the universities in Karlsruhe,

[5] The 20 HEIs with the highest funding in the various federal funding areas, are shown in section 4.5.

Berlin (TU) and Brunswick distinguished themselves as the HEIs with the strongest focus on information technology. In absolute terms, the highest amount in this category was received by the TU Munich.

Federal funding for "aeronautical and space research" is likewise concentrated mostly at non-university research institutions. The universities' share of this funding was about 20%; the 40 HEIs with the most DFG funding received a total of €54 million in this category during the three-year report period. The universities in Bremen, Aachen, Brunswick and Cologne were awarded the largest funding amounts for aeronautical and space research, both in absolute terms and relative to the total income from federal funding in each case. With a share of 29%, this area is one of three key activities at the University of Bremen (together with "sustainable development" with 25%, and "geosciences" with 18%). In Brunswick too, every fifth euro from the federal government is allocated to aeronautical and space research (information technology is, with 25%, the second priority activity here).

The thematic funding area of "energy research and energy technology" is especially important for the universities of Stuttgart and Hannover, although, measured in terms of the total amount of federal funding received by HEIs, Stuttgart takes on a more important role. Furthermore, the universities in Munich (TU), Aachen, and Dresden have relatively high shares in this funding area. However, as described above, these institutions also give extensive coverage to other funding areas.

Further consideration is given to the individual federal funding areas in section 4.5.

3.4.3 Thematic Profiles of HEIs, Based on R&D Funding in the Sixth EU Framework Programme

The information provided by the EU Office of the BMBF on funding allocations in the Sixth EU Framework Programme (FP6) is from January 2006. The data base covers the HEIs and non-university institutions participating in the current Framework Programme. The projects documented have a total volume of €9.7 billion. This corresponds to approximately one-half of the total budget of FP6. The data therefore provide a "half-time balance" that is, perhaps, preliminary, but which, in view of the sums under consideration, is nevertheless a reliable intermediate result. Approximately €1.8 billion was allocated to German institutions, 32% of which went to HEIs. The proportion of this which went to the 40 HEIs in this profile comparison amounts to 85%.

The EU differentiates between three main blocks of activity and seven "thematic priorities" (cf. section 2.3). The following profile comparison is restricted to activities in these seven fields, which are referred to here as "funding areas".[6]

The form of the graph in Figure 3-4 is similar to that of the version shown above: the more technical funding areas are located in the top-left part of the graph. In the middle both natural science- and social science-related funding areas are found. And finally, the life sciences and the relatively small area of "food quality and safety" are grouped at the right-hand side and at the lower-centre of the graph.

The arrangement makes a cluster formation of institutions visible: On the one hand, those HEIs which concentrate on information technology, nanotechnology, materials science and aerospace research, and on the other, those which also participate in projects related to "sustainable development, global change and ecosystems". The largest thematic area in terms of funding volumes, "life sciences, genomics and biotechnology for health", forms the core of another cluster.

As shown by the diameter of their symbols, the technically oriented universities in Munich (TU), Aachen, Stuttgart and Karlsruhe and those life sciences-oriented universities in Munich, Heidelberg and Tübingen prove to be especially active as regards EU funding. As might be expected from its focus on the federal funding area "information technology", the TH Karlsruhe concentrates in this case above all on the "information society technologies" programme. Roughly two-thirds of all EU funding allocated to

[6] The 20 institutions with the highest EU incomes in some of these areas are shown in section 4.5. Table A-16 in the appendix gives an overview of the 40 higher education institutions with the highest DFG funding.

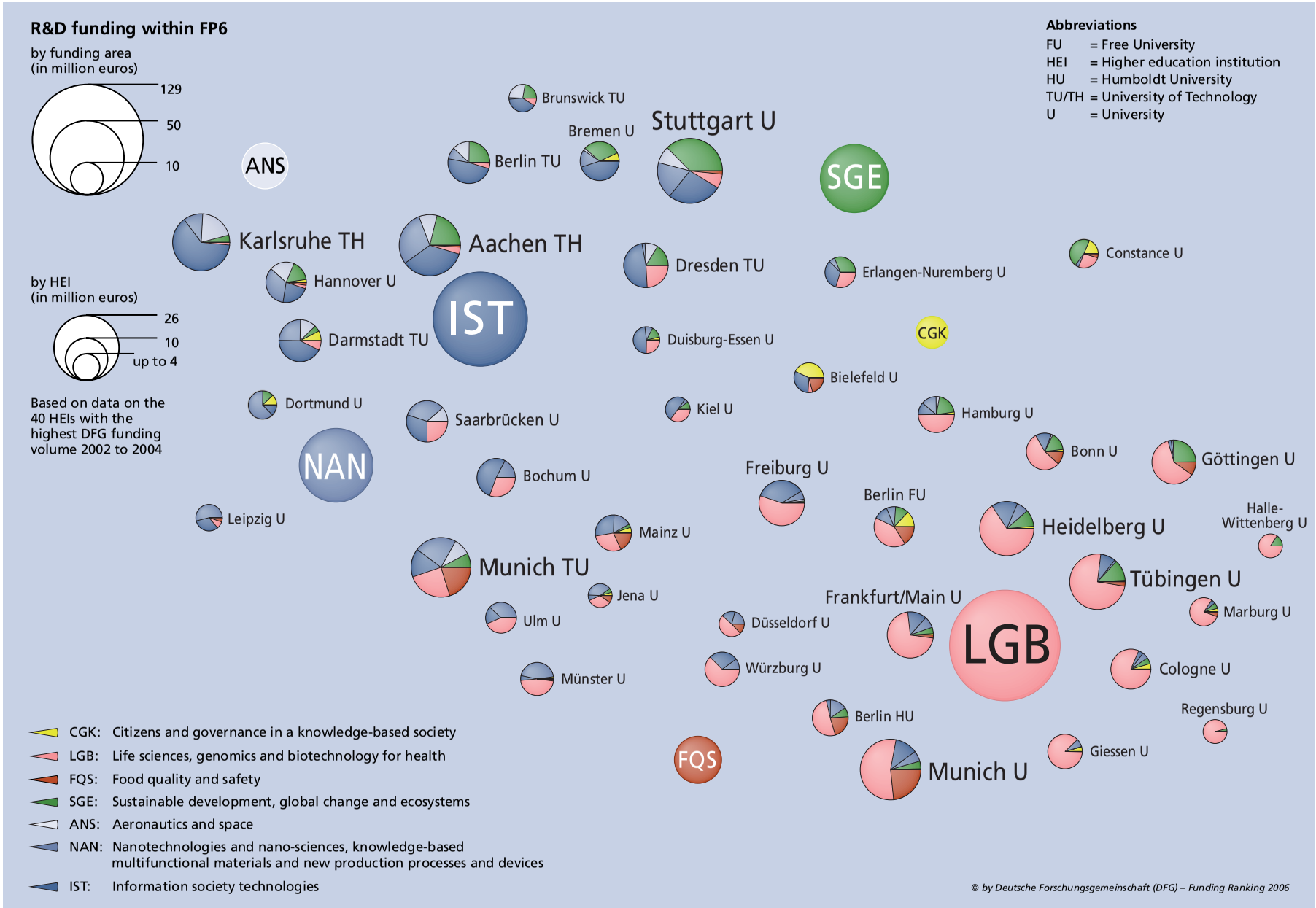


Figure 3-4:
Funding profile of higher education institutions based on R&D funding within the EU's Sixth Framework Programme in 7 thematic funding areas

this Baden-Württemberg university can be attributed to this programme. Another key activity here is "aeronautics and space", which is also an important element in the profiles of the universities of Hannover and Brunswick.

The profile of TH Aachen is differentiated from that of Karlsruhe through its relatively balanced set of projects, divided almost equally between nanotechnology, information technology and research into sustainable development. The latter accounts for the largest portion of the profile of Stuttgart, the university with the overall highest level of EU funding, but also for large portions of the profiles of the universities in Bremen, Erlangen-Nuremberg, Göttingen and Constance.

A substantial share of the, in comparison with the above-mentioned universities relatively low, total income of the University of Constance from FP6 is accounted for by funding from the social science related programme "citizens and governance in a modern knowledge-based society". Furthermore, two other universities with strong positions in the social sciences — the FU Berlin and the University of Bielefeld — received large amounts in this programme, and the participation of Bremen, Darmstadt and Dortmund, among others, is also documented.

The TU Munich, the second strongest EU funding recipient, features a profile that targets practically the whole range of EU programmes. As with the Munich (U), the HU Berlin and the University of Mainz, large shares of the EU budget were acquired with projects belonging to the food quality and safety programme. Nanotechnology and life sciences represent two further priorities for the TU Munich. Other HEIs with a strong emphasis on the life sciences include Tübingen, Heidelberg, Göttingen and Freiburg, as well as the other EU-active institutions grouped around the relevant symbol.

In section 4.5, further consideration is given to the 20 HEIs that are most active, in terms of EU funding, in each of the funding areas.

3.5 Regional Research Profiles

The following cartographic representations show how DFG awards and direct federal R&D project funding are distributed when considering both higher education institutions and non-university research institutions.[7] On the one hand, it should become apparent which regions are particularly active in relation to research funded by these two bodies. On the other hand, differentiation according to research areas (DFG) and funding areas (German government) enables recognition of the thematic priorities that are set in these regions. The unit of analysis is formed by urban districts, rural districts and federal states. The latter includes the general funding volume for research institutions located in a particular state.

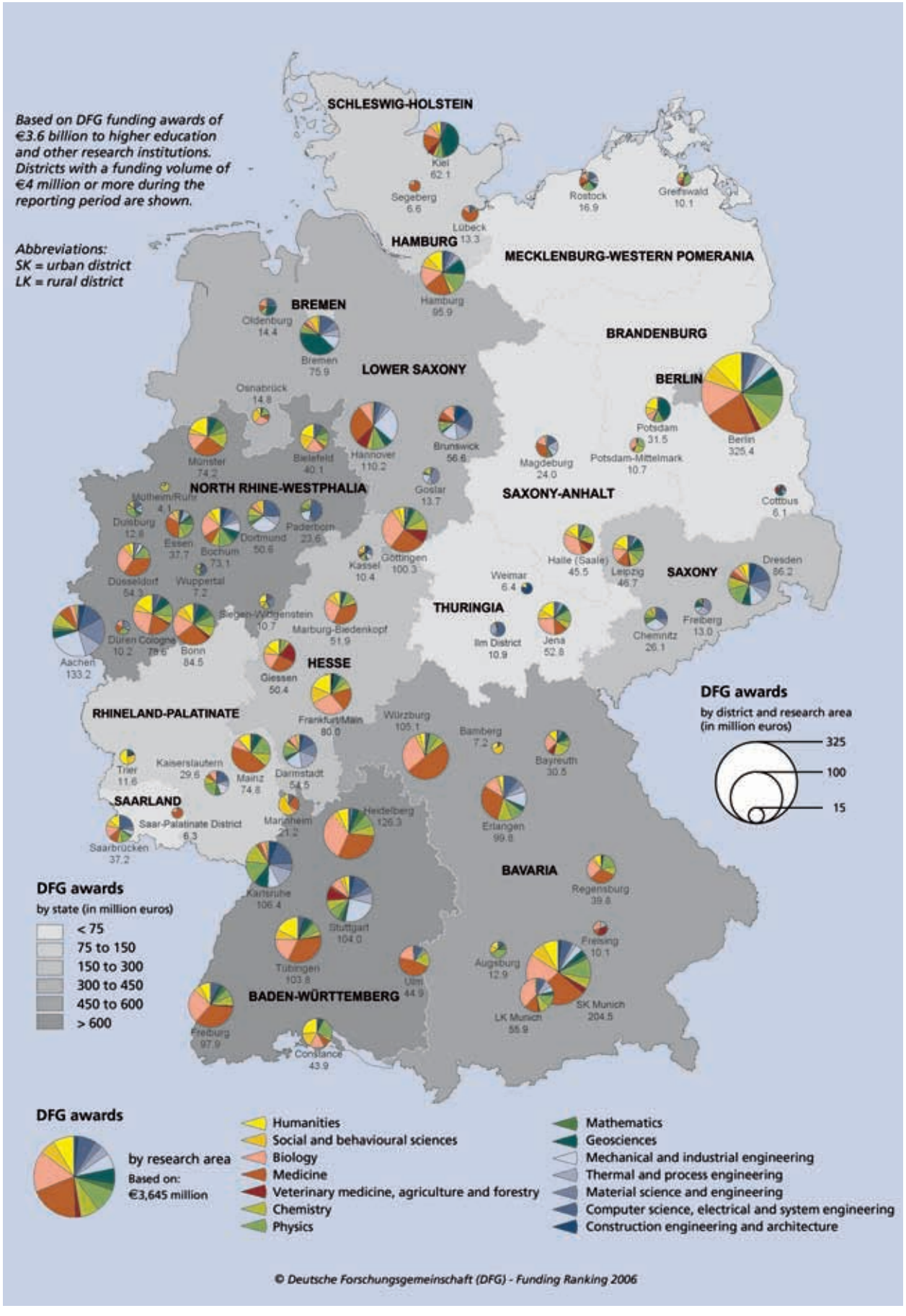
Figure 3-5 depicts the regional distribution of DFG funding awards, showing districts with a funding volume of at least €4 million. The districts shown represent about 98% of the total DFG funding allocated to German research institutions.

First of all, Berlin and Munich are seen to be the regions with the highest DFG funding. Berlin HEIs and non-university research institutions received funding volumes of over €325 million, and the urban and rural districts of Munich together received €261 million. When compared to the previous ranking, the distance between these two regions has thereby increased — in the study period 1999 to 2001, the funding volumes of these regions amounted to €307 and €270 million. In relation to the funding received from the DFG, Berlin thus shows a slight increase and Munich a slight decrease.

As in the last ranking, the "Aachen – Bonn – Cologne" region proves to be strongly funded. The DFG allocated a total of €296 million to research institutions in this region, and if Düren is included, along with the Research Centre Jülich located there, the figure amounts to €306 million. Hannover and Brunswick together received €167 million, the south German regions "Mannheim – Heidelberg – Karlsruhe" and "Stuttgart – Tübingen – Ulm" each received more than €250 million, the "Dresden – Freiburg – Chemnitz" region reached a total of €125 million and the amount of funding allocated to "Leipzig – Halle" was €92.

[7] For technical reasons, a corresponding analysis was not possible on the basis of the data available for FP6. An analysis will follow at a later time on the basis of consolidated and appropriately prepared data.

Figure 3-5:
Regional distribution of DFG awards (2002 to 2004)



Only considering the larger "DFG regions", a comparison with the last ranking from 2003 reveals, with the exception of Berlin mentioned above, significant increases in funding volumes for Kiel, Dresden, Karlsruhe, Bremen, Göttingen and Würzburg. The DFG Research Centres established in the last four of these regions, and in Berlin, are responsible for a relevant share of this increase.

The differentiation by research area represents an important supplement to the funding totals per region that can be read from Figure 3-5. Similar to the profile analysis for selected HEIs presented above, it allows conclusions to be drawn regarding the DFG funding priorities set by the relevant regions. As shown by a comparison with the figures given in Table 3-1 for DFG awards per higher education institution, the HEIs located in some districts are virtually the only DFG funding recipients found there. The regions in which the total amount of DFG funding received is only slightly more than the funding amounts received by the universities located there include Würzburg, Erlangen-Nuremberg, Regensburg and Giessen. In these regions, the universities are almost the only DFG funding recipients and their profiles therefore correspond to the institutional profiles already presented in Figure 3-1.

The "Berlin – Potsdam" region offers itself as an exemplary research profile. The life sciences are an important element here, although it also gives noticeable coverage to research in the humanities and social sciences. Regions with a distinct focus on the geosciences include Kiel and Bremen. The three technical universities in Saxony, together with the non-university institutions located close by, shape the profile of the region above all in the areas of mechanical engineering, computer science, electrical and system engineering.

On the whole, the profile analysis clearly indicates a highly differentiated spectrum of regional profiles.

Taking into account only the total funding volumes that result for the individual German states, it is especially Baden-Württemberg, North Rhine-Westphalia and Bavaria, as well as the city states Bremen, Berlin and Hamburg that come out as the most highly funded. In the eastern German states, it is above all Saxony which has a comparable funding volume.

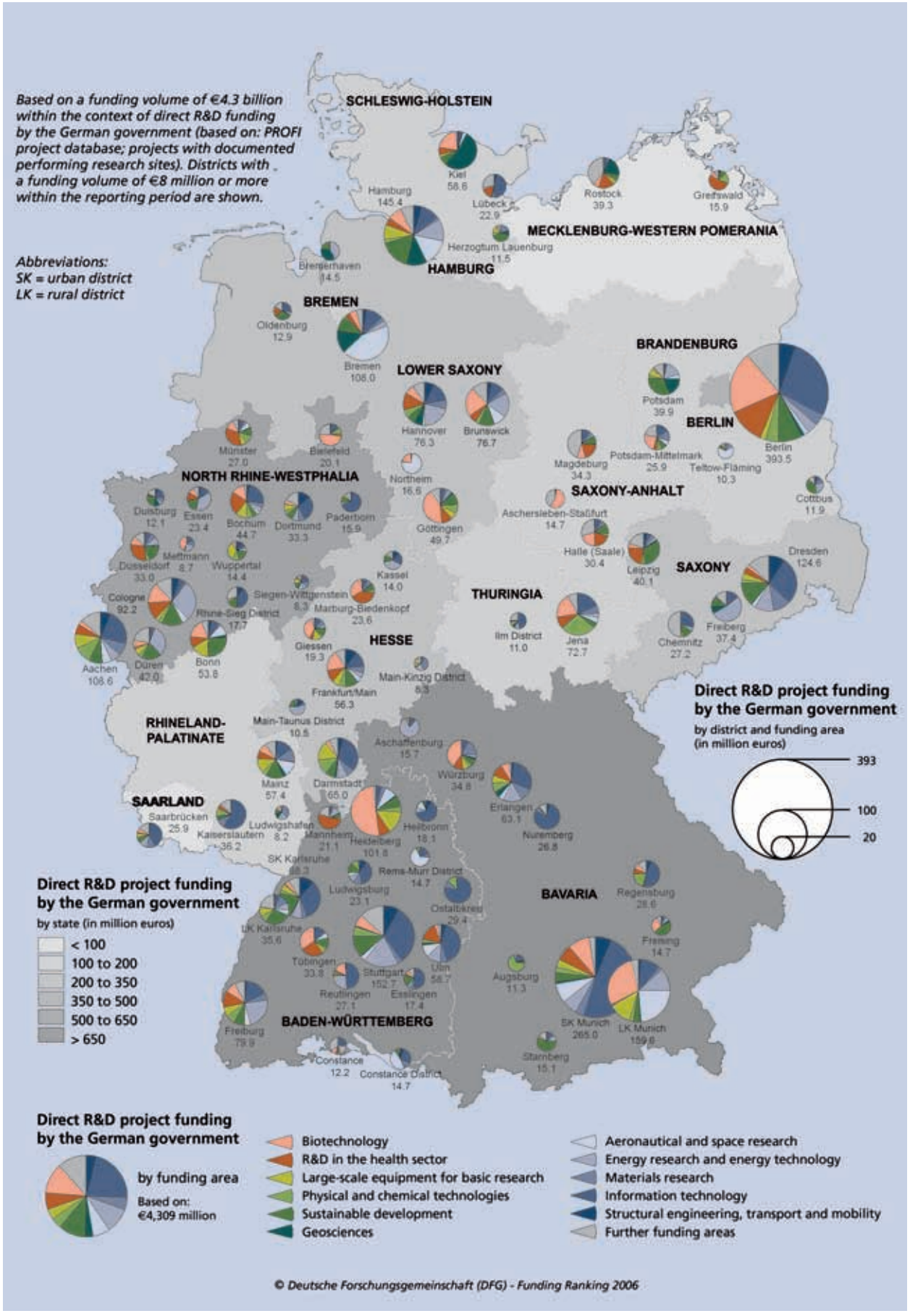
Whereas the graph based on DFG funding distinctly shows the way in which HEIs influence the research profile of a region, the regional distribution map for federal funding considered in this report shows, to a large extent, amounts received by industry-related research institutions and by commercial business in the context of direct funding for R&D projects. As shown in Table 2-10 in chapter 2, almost half of the R&D project funding that forms the basis of this analysis goes to commercial business. A comparison with the DFG analysis above also presents the opportunity of highlighting the specific potential in these regions for cross-university, cooperative research in selected research areas.

As in the institutional profile analysis, the current analysis is also based on the "funding area" system described in section 2.2 above (here including the "further funding areas" category). The graph shows districts with a funding volume of at least €8 million.

Consistent with the DFG analysis is the fact that the two research locations Berlin and Munich play a leading role. Between 2002 and 2004, the federal government provided over €390 million for research projects in the capital city, as part of the direct funding of R&D projects taken into account by this study; the urban and rural districts of Munich together received about €425 million. Other regions with large volumes of funding include Stuttgart, Heidelberg, Hamburg, Dresden, Bremen, and the urban and rural districts of Karlsruhe. With a more comprehensive definition of "region", it can be seen that "Aachen – Bonn – Cologne (plus Düren/Jülich)" is very active in terms of federally funded research, as is the Swabian network concentrated in Stuttgart, Reutlingen, Esslingen, Ulm and Ostalbkreis. The "Hannover – Göttingen – Brunswick" region is another focal point.

A glance at the subject profiles shows that the two leading research locations, Berlin and Munich, benefit on a large scale from one of the main federal funding programmes, which focuses on information technology. The information technology funding area is shaped to a great

Figure 3-6:
Regional distribution of direct R&D project funding by the German government (2002 to 2004)



extent by funding recipients other than universities.

This area is also a main priority of the above-mentioned Swabian cluster (Stuttgart, Reutlingen, Esslingen, Ulm and Ostalbkreis). In Bavaria, information technology represents a large share of the federally financed research at Erlangen, Nuremberg and Regensburg, and in the Rhineland-Palatinate, Saarland and Hesse, research institutions in the districts of Saarbrücken, Kaiserslautern and Darmstadt are specialised in this field. In Dresden, in addition to the HEIs located there, it is primarily Fraunhofer institutes that are involved in research in this category. Furthermore, there is a whole array of smaller locations whose subject profiles show a distinct information technology orientation.

In the profile comparison presented above, Bremen was described as a university with a strong emphasis on aeronautical and space research. As indicated by the graph, this university research is carried out in a field which is a key research area for Bremen as a whole. As part of the direct federal R&D project funding, the university received almost €10 million for projects in aerospace research, while other institutions in the state of Bremen received almost €35 million during the three-year study period.

The last example to be mentioned here is biotechnology. A strong emphasis on this area has been documented for Munich, Berlin, Kiel, Göttingen, Würzburg, Bielefeld and, above all, Heidelberg. According to current statistics from "biotechnologie.de", Munich and Berlin-Brandenburg have a high concentration of companies that specialise in biotechnology research.[8]

If one considers, finally, the state-specific shares, a clear concentration on Bavaria and Baden-Württemberg becomes apparent, and, to a lesser extent, North Rhine-Westphalia. A comparison of the eastern German states shows that, as in the case of DFG funding, Saxony has the highest funding volume in absolute terms. Finally, the city states of Berlin, Hamburg and Bremen, which have high shares of both federal and DFG funding.

3.6 Conclusions

The analyses have shown for a selection of higher education institutions — the 40 main DFG funding recipients for the period 2002 to 2004 — and in a regional comparison, the variety of ways in which their third-party funded research activities can be used in the presentation of compact and, at the same time, differentiated subject profiles. The unique potential of the form of presentation chosen for the institutional comparison lies in the opportunity of expanding the individual findings for the three funding bodies, which have only been described in outline here. For example, the following pointers can be given for further interpretation.

The HU and FU Berlin are among the universities that collaborate frequently in DFG-funded cooperative programmes. The most evident case of this cooperation is the Charité University Medical Centre in Berlin, which they have jointly run since 2004. A simple explanation of this type of cooperation is the spatial proximity of the two universities. However, the analyses show that another factor plays a decisive role: their similar research profiles. The FU and HU Berlin appear to be "close" in several ways — whether in terms of the thematic focus of project and individual funding received from the DFG, or of the portfolio of programmes funded by the German government, or of the funding going to these universities from the various FP6 funding lines. Multiple opportunities for cooperation are therefore open to the scientists and academics of the two universities.

This also applies, in a very similar way, to the universities of Tübingen and Heidelberg. A large part of their third-party funding awards from the DFG are in the life sciences (as well as a substantial amount in the humanities and social sciences), and they also cover the natu-

[8] Further information on the federally funded "clusters and networks" in the field of biotechnology can be found on the BMBF website at www.biotechnologie.de (status: 04 September 2006). It also contains the reference to the company survey, which found that, in Germany, "a total of 480 companies are significantly or exclusively involved with biotechnological processes in accordance with the OECD definition of dedicated biotechnology companies". A cartographic representation shows the distribution of these companies. There are large clusters in Bavaria (94 companies, mainly in Munich), followed by Baden-Württemberg (77) and North Rhine-Westphalia (55). Berlin and Brandenburg together have 84 companies.

ral sciences group. The two universities also have similar subject profiles in relation to federal and EU funding — spatial and thematic proximity therefore occurs here too.

Taking a single university as an example, Bremen has a research profile located primarily on the interface between geosciences and engineering sciences. This profile is of particular relevance to research projects that are funded — by the German government for example — in "aeronautical and space research" and "geosciences", on the one hand, and in "sustainable development", on the other. In keeping with this, the University of Bremen appears, in terms of EU funding, to have a strong emphasis on environmental topics (grouped here as "sustainable development, global change and ecosystems") and on computer science-related issues ("information society technologies"). On the whole, therefore, this is a very specific profile.

As a final example, the TH Karlsruhe, which has a position, in terms of DFG funding, on the interface between engineering sciences-related and natural sciences-related research, has an exactly corresponding profile in terms of research funded by the federal government. Here, as with the EU, the TH Karlsruhe is an institution that uses most of its research budget from this source on projects in the area of information technology, but which also uses its natural sciences profile to carry out projects in the federal funding area "sustainable development".

In addition to these specific emphases, the analysis as a whole shows just how differentiated the research market is for the 40 higher education institutions included in the study. As part of a ranking, and keeping in mind the special issues pointed out in chapter 2 that are associated with particular subjects (for example, the fact that third-party funding requirements vary widely from subject to subject), the profile analyses offer a good basis for a differentiated examination of the institutions' ranking positions, focussing on individual research areas and funding areas.

Not merely the higher education institutions, but also the regions in which they are located develop specific thematic profiles. Even a consideration of just the two largest funding bodies for publicly financed research has shown how differentiated these regional priorities are. Apart from a mere comparison of funding volumes that distinguishes the regions with a high level of third-party funding from those with lower levels of funding, a consideration by district of the funding received by HEIs and non-university research institutions in particular subject and funding areas allows, above all, important conclusions to be drawn regarding the specific priorities of the research regions distinguished in this way. The material presented here for the first time in this form invites more detailed examinations at the level of institution, region and state.

The analyses presented here of the priorities set by institutions and regions are mostly restricted to the level of research and funding area. A more detailed account would be beyond the scope of this Funding Ranking. Further information on individual research activities and projects and on the participating institutions can be found in the project databases, which can be accessed via internet, of the DFG (www.dfg.de/gepris) and the BMBF (www.foerderkatalog.de).

4. Indicator Comparison at the Level of Research and Funding Area

This chapter analyses the funding profiles of higher education institutions and the research activities derived from these, differentiated by research area and funding area. On its two highest levels, the DFG subject classification system differentiates between four scientific disciplines divided into 14 research areas. The results of an indicator comparison for these research areas will be presented first, followed by individual analyses of selected funding areas of the EU and the German government and on research funding by the German Federation of Industrial Research Associations (AiF).

As already stated in the remarks on method, the borders between research areas and funding areas are often difficult to define. This can be seen in the life sciences, for example, in the area of basic biomedical research, but also in subjects such as physics and chemistry, which, as classic basic research subjects, play a role in many other disciplines. Accordingly, the analyses presented below cover only the "core" of what is actually researched by HEIs in the different fields. Around this core are grouped neighbouring research fields, which influence the research in particular subjects in various ways and with different emphases from one HEI to the next. These "neighbouring fields" play an important role in the interpretation of the findings presented for each research and funding area, as described in the profile analyses in chapter 3. There will therefore be continual reference to these analyses.

The following indicators were taken into account for the focus on research areas: DFG awards decided on between 2002 and 2004 (DFG's own data) and the total third-party funding income from 2001 to 2003 (according to a survey by the Federal Statistical Office) form the basis for examining the third-party funding received by HEIs. The number of DFG reviewers consulted in the written review process for proposals decided on between 2002 and 2004 is used as an indicator of the scientific expertise of a research institution. Research stays by Alexander von Humboldt Foundation (AvH) visiting researchers (2000 to 2004) and by the international researchers funded by the German Academic Exchange Service (DAAD) are taken as indications of international appeal and prominence. The level of participation in DFG coordinated programmes (2002 to 2004) and the number of institutions cooperated with in these, are used in the analysis of the cooperative activities and networking of research institutions.

Comprehensive details on the methodology and the base data of these indicators are given in chapter 2.

The indicators are presented in the form of compact comparison tables, limited in each case to the 20 HEIs[1] that received the highest amount of DFG funding in the relevant research area. For each indicator, absolute values are given (e. g. totals are given in the case of third-party funding indicators) and percentage values are given in cumulative form, i. e. added up from one ranking position to the next. In this way, the tables give immediate information about the relative weighting of the HEIs in terms of individual indictors, as well in comparison with other indicators. The colour coding shows the ranking group for each HEI (rank 1 to 10, rank 11 to 20, etc.).

The tables that follow for selected funding areas of the federal government and the Sixth EU Framework Programme show the 20 leading HEIs in each case. Furthermore, section 4.5 describes the HEIs that received larger amounts in the Industrial Cooperative Research (IGF) programme of the AiF.

A methodological feature of DFG rankings, already included in the previous report, is the network analysis procedure, which enables a visualisation of the cooperation between HEIs and non-university research institutions.[2] As a supplement to the rankings that consider the activities of individual institutions in quantified form, these visualisations permit statements on the structural networking of institutions.

Models of network analyses for four research areas are included in the printed version of this report. The internet version covers the entire spectrum of research areas (cf. www.dfg.de/ranking/ranking2006/netzwerke). The analyses are restricted to DFG programmes that focus on the funding of local cooperation or — in the case of geographically distributed Research Units — that support the transregional cooperation of what is usually a small number of participants. The structure of the visualisations is based on the geographical location of the institutions. In this way, regional priorities become clear; i. e., the graph shows which institutions in a region have participated in DFG coordinated programmes for particular research areas and have thus positioned themselves in a specific way. Links between institutions show in what contexts joint participation in DFG programmes has been established. In this way, "cooperation clusters" formed by especially frequent cooperation in DFG-funded programmes become immediately apparent (cf. section 2.3.5 for further methodological considerations).

4.1 Indicator Comparison for the Humanities and Social Sciences

Since the last ranking, the subject classification system for the scientific discipline known as the "humanities and social sciences" has been significantly revised. Up to then, four research areas had been differentiated ("social sciences", "history and fine arts studies", "linguistics and literary studies" and "psychology, education, philosophy and theology"), but there are now only two, "humanities" and "social and behavioural sciences". The DFG review boards assigned to the two areas are shown in Table 2-1 in chapter 2.

4.1.1 The Humanities

Between 2002 and 2004, the DFG granted over €320 million for the subjects grouped in this category. The funding went to researchers working at 96 HEIs (€287 million) and exactly the same number of non-university research institutions (€25 million).[3] After medicine, the humanities thus has the highest number of non-university DFG funding recipients (cf. Table A-14 in the appendix). The institutions with substantial DFG funding volumes include the Prussian Cultural Heritage Foundation, the Berlin-Brandenburg Academy of Sciences (BBAW) and the German Archaeological Institute (DAI) facilities — all three of which are based in Berlin. Mention must also be made of Germany's oldest literature and art history research institute, the Freies Deutsches Hochstift at the Goethe Museum in Frankfurt, the German Muse-

[1] Comprehensive tables, differentiated by indicator, are given in the appendix.

[2] The network analyses were carried out with the software program UCINET V (cf. Borgatti, Everett and Freeman 2002) and the visualisation program NETDRAW (cf. Borgatti 2005).

[3] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-1:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in the humanities

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG-reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Berlin FU	19.4	6.8	27.1	5.7	62.6	5.5	83	11.0	81	9.9	8	3.8	14
Tübingen U	19.0	13.4	27.4	11.5	72.1	11.7	43	16.8	33	13.9	15	10.9	16
Munich U	13.8	18.2	26.4	17.0	63.1	17.3	64	25.3	46	19.6	11	16.1	11
Münster U	13.7	23.0	18.4	20.9	48.4	21.5	21	28.1	16	21.5	3	17.5	0
Frankfurt/Main U	12.4	27.3	18.9	24.8	32.0	24.3	19	30.6	25	24.6	10	22.3	10
Cologne U	12.3	31.6	22.6	29.6	45.2	28.2	49	37.1	26	27.8	4	24.2	10
Berlin HU	11.6	35.6	17.9	33.3	49.7	32.5	68	46.1	79	37.4	14	30.8	18
Hamburg U	11.2	39.5	10.5	35.5	43.0	36.3	18	48.5	26	40.6	6	33.6	6
Constance U	11.1	43.4	5.5	36.7	18.4	37.9	17	50.8	13	42.2	7	37.0	17
Heidelberg U	9.2	46.6	14.2	39.7	40.3	41.4	51	57.6	45	47.7	7	40.3	13
Jena U	8.9	49.7	7.8	41.3	24.0	43.5	5	58.2	9	48.8	5	42.7	14
Freiburg U	8.2	52.6	11.6	43.8	45.1	47.4	24	61.4	35	53.1	1	43.1	0
Bielefeld U	8.2	55.4	11.9	46.3	15.8	48.8	8	62.5	10	54.3	6	46.0	3
Mainz U	7.7	58.1	14.4	49.3	29.2	51.4	11	64.0	14	56.0	7	49.3	15
Leipzig U	7.5	60.7	10.5	51.5	17.5	52.9	14	65.8	36	60.4	5	51.7	7
Giessen U	7.2	63.2	7.5	53.1	11.2	53.9	4	66.4	6	61.1	7	55.0	10
Bonn U	6.8	65.6	18.0	56.8	39.1	57.3	29	70.2	21	63.7	4	56.9	8
Potsdam U	6.5	67.8	8.7	58.7	14.5	58.5	9	71.4	13	65.3	8	60.7	10
Bochum U	6.4	70.1	12.5	61.3	32.6	61.4	15	73.4	38	69.9	6	63.5	6
Halle-Wittenberg U	6.1	72.2	5.2	62.4	22.8	63.4	7	74.3	18	72.1	5	65.9	8
Top 20 in total	**207.1**	**72.2**	**297.0**	**62.4**	**726.6**	**63.4**	**559**	**74.3**	**590**	**72.1**	**139**	**65.9**	**–**
Other HEIs	**79.8**	**27.8**	**179.0**	**37.6**	**420.0**	**36.6**	**193**	**25.7**	**228**	**27.9**	**72**	**34.1**	**–**
HEIs in total	**286.9**	**100.0**	**476.0**	**100.0**	**1,146.6**	**100.0**	**752**	**100.0**	**818**	**100.0**	**211**	**100.0**	**–**
Based on: N HEIs	**96**		**159**		**90**		**52**		**47**		**57**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the „third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Hamburg, Constance and Halle-Wittenberg did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

um in Munich, the Mecklenburg-Western Pomerania Regional Authority for Culture and the Preservation of Monuments and Historic Buildings, and the Foundation of Weimar Classics.[4]

The humanities provide 19% of all the professors working at the HEIs considered here, but receive less than 9% of all DFG third-party funding — evidence of the fact that, compared with other subjects, third-party funded research plays a subordinate role in the humanities. This is also shown by the figures on total third-party funding presented in section 2.3. Based on these data from the Federal Statistical Office, it can be established that over €107,000 in third-party funding was awarded per professorial position during the three-year period, far below the overall average of €435,000. In this subject area, therefore, HEIs with relatively low volumes may nevertheless count as having a high level of third-party funding.

While the DFG has a statutory obligation to promote "all branches of science and the humanities", the Sixth EU Framework Programme and the federal government both concentrate on the "hard sciences" and applied research. Humanities scholars can seldom benefit from these funding opportunities. As a result, DFG awards represent the main source of income from third-party funding in the humanities.[5] For this reason, among the indicators of third-party funding used in this report, only DFG awards and the data on total third-party funding income provided by the Federal Statistical Office are conclusive.

Table 4-1 shows a summarised comparison of indicators for the 20 HEIs with the highest DFG funding volumes in the humanities (2002 to 2004). Corresponding tables have been prepared for each of the 14 research areas considered in this ranking. These 20 HEIs account for 72% of all of the DFG funding received for the humanities by scientists and academics working at HEIs; the first 10 HEIs account for 47%.

The table is led by universities that, in consideration of their DFG funding volumes, could be termed "humanities strongholds". The Free University of Berlin (FU) and the University of Tübingen, with more than €19 million each in three years, are ranked first and second; the Ludwig Maximilian University in Munich and the Westphalian Wilhelm University in Münster follow in third and fourth place, with almost €14 million each. Among the top-twenty leading institutions in the humanities, there are noticeably more eastern German universities than compared to the other research areas: apart from the Humboldt University (HU) in Berlin, these universities are found in Jena, Leipzig, Potsdam and Halle-Wittenberg.

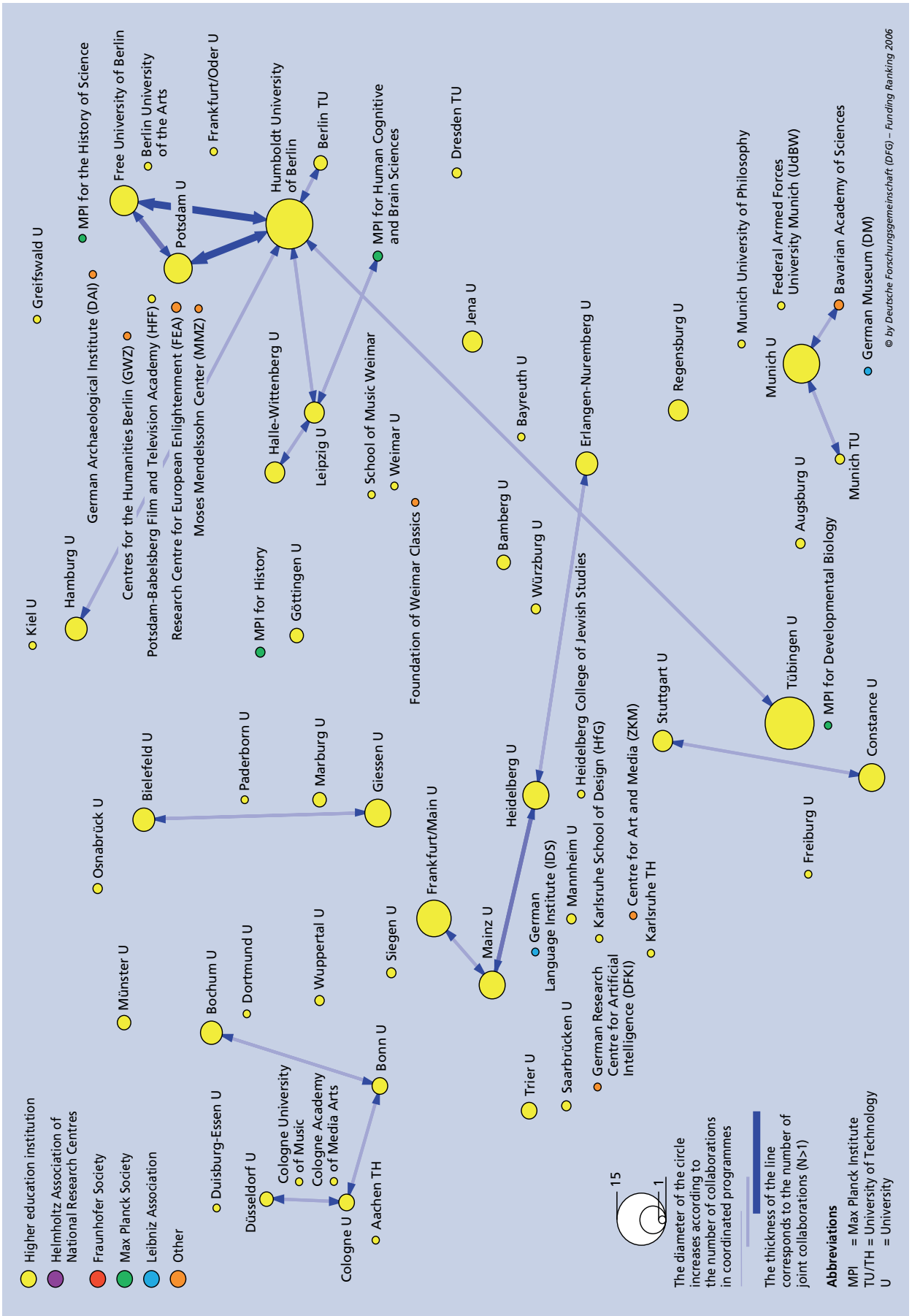
In keeping with the significance of DFG awards in the total third-party funding income of the humanities, a comparison with the figures from the Federal Statistical office for the years from 2001 to 2003 (DFG awards 2002 to 2004) shows a high correlation. The universities of Tübingen, Berlin (FU) and Munich (U) are leading the table, and the other HEIs that figure largely in DFG-funded research in the humanities are also to be found among the leading positions in the Federal Statistical Office data.

What level of prominence among international visiting researchers is enjoyed by the humanities? First of all, it must be stressed that the humanities have an especially strong attraction for visiting researchers from abroad. More than 18% of the AvH-funded stays of visiting researchers are humanities-related, and the DAAD-funded proportion is almost 27%. The humanities is thus the research area that receives the most attention from international researchers funded by the AvH and the DAAD (cf. Table 2-11 in chapter 2). The 20 HEIs with the highest amount of DFG awards in this area are the destination of 74% of all AvH-funded visiting researchers and 72% of all DAAD-funded guests. Clear preferences are apparent for fellows and prize-winners funded by the AvH: it is prima-

[4] This ranking does not cover the Humanities Research Centres (GWZ), which were re-established in 1992 after the dissolution of the humanities research institutes of the Academy of Sciences in the German Democratic Republic. The centres are run by the states of Berlin, Brandenburg and Saxony, and the DFG provides supplementary funding. For a total of five centres, the DFG awarded €18.9 million between 2002 and 2004 (Berlin: €10.8 million, Potsdam: €3.4 million, Leipzig: €4.8 million). Additional funding, in smaller amounts, went to scientists and academics at these centres for individual projects (cf. Table A-14 in the appendix).

[5] Funding is also available from foundations and state budgets.

Figure 4-1:
Research institutions participating in DFG coordinated programmes and resulting collaborative relations in the humanities



rily the universities in the capital city, the FU and the TU, which are of particular interest to this group — even the Technical University of Berlin (TU), which otherwise occupies a middle position for the humanities, is among the top-ten favourites of AvH visiting researchers. The other prominent AvH institutions are also found among the leading institutions in terms of DFG awards. There is therefore a large correlation between the institutions with the highest DFG funding and those which are most frequented by visiting researchers funded by the AvH.

This finding is confirmed, in a very similar way, if the number of international researchers funded by the DAAD is taken as the benchmark.

The figures just discussed have shown that in the humanities it is above all the universities in Berlin that are well positioned. Figure 4-1 reinforces this result and at the same time points to a particular strength of Berlin. Designed to reflect geographical distribution, the graph includes all HEIs and non-university research institutions involved in DFG-funded Research Units, Research Training Groups and Collaborative Research Centres. The diameter of the symbols indicates the number of participations in these programmes and the links between institutions indicate two or more joint participations. Data on a total of 115 essentially humanities-oriented programmes form the basis of the graph, with the highest share taken by Research Training Groups (65), followed by Collaborative Research Centres (32) and then Research Units (18) (cf. Table 2-9 in chapter 2).

The particular strength of Berlin in the humanities is shown by the density of the research landscape there, i. e. by the number of institutions that are active in DFG programmes involving local and transregional networks. Humanities scholars at the four Berlin universities — FU, HU and TU Berlin as well as the University of the Arts (UdK) — are just as active here as researchers at the nearby University of Potsdam. Also integrated are researchers from the Film and Television Academy in Potsdam – Babelsberg, the DFG-funded Humanities Research Centres and various other institutions. The FU Berlin, HU Berlin and the University of Potsdam form a distinct cluster that is linked by numerous joint participations in humanities programmes. Two examples of such include Research Unit 391 "Picture-Scripture-Number", which apart from the affiliated humanities subjects, also incorporates researchers from computer science institutes at the FU, HU and TU Berlin, and Research Training Group 707 "Makom: Place and Places in Jewish Past and Present", run by the University of Potsdam, which also integrates researchers from the universities in Berlin as faculty supervisors for the young researchers trained there.

In Table 4-1, the last column providing the number of cooperating institutions expresses the visualised information in quantified form. Whereas the illustration only takes into account the more intensive cooperation structures (at least two joint participations in DFG-funded programmes), the values in this column show that researchers from the two Berlin universities (FU and HU), but also from the universities in Constance and Tübingen, which are very active in the humanities, have established the largest number of external cooperation links (the "Partner institutions" column). It is precisely here that DFG-funded cooperation programmes contribute to the networking of research in the humanities.

4.1.2 Social and Behavioural Sciences

The subjects classified under social and behavioural sciences, in particular economics and jurisprudence, belong to those that are most in demand among students. However, graduates from these subjects seldom pursue careers in science and academia. The training involved here normally leads to careers in industry and business. In the last few years and decades, not a few universities have emerged as both highly popular in quantitative terms and, in qualitative terms, as highly rated "centres of education" (cf. university ranking of the Centre for University Development (CHE) at www.che.de). In the area of social and behavioural sciences, many higher education institutions have managed to establish a good and stable reputation.

The analyses presented here, as already in the humanities, cover a relatively broad range of fields. The spectrum extends from psychology, pedagogy and the various branches of social science (sociology, political science, media

research, etc.) to economics and jurisprudence. Each of these subjects follows its own research standards and each of these scientific communities concentrates on its own fields of research.

In the context of this ranking, a quantitative consideration of research activities in the "social and behavioural sciences" is perhaps a rather high level of aggregation, but it provides some important indications. At which HEIs have the subjects in this category made an impression on the research profiles of their institutions? Is it possible to identify HEIs that have acquired an international (for example, among visiting researchers funded by the AvH or the DAAD) reputation as interesting partners for social and behavioural science oriented research?

In the period from 2002 to 2004, the DFG provided more than €224 million (6% of the total volume) for subjects in this category. The amount was divided between 94 HEIs (€203 million) and 50 non-university research institutions (€19 million).[6] Institutions that received substantial amounts of funding for the social and behavioural sciences include the German Institute for Economic Research (DIW)[7] and the Max Planck Institute for Human Development, both located in Berlin, the Leibniz Research Centre for Working Environment and Human Factors (IfADo) in Dortmund, the Peace Research Institute (HSFK) in Frankfurt, the Max Planck Institute for Comparative and International Private Law in Hamburg, the Leibniz Institute for Science Education (IPN) in Kiel, the Max Planck Institute for Human Cognitive and Brain Sciences based in Leipzig, the Centre for European Economic Research (ZEW) in Mannheim, and the Knowledge Media Research Centre (IWM) in Tübingen — institutions, therefore, that together cover the whole range of this subject area (cf. Table A-14 in the appendix).

Table 4-2 shows the twenty HEIs with the highest DFG funding volume in this subject area between 2002 and 2004 (cf. Table A-8 in the appendix for all HEIs covered in this study). The ranking is led by the Ludwig Maximilian University in Munich, whose researchers in the social and behavioural sciences were awarded almost €13 million in DFG funding during the three-year period. In second place, and also topping the €10 million mark, is the relatively small University of Mannheim, which specialises in this research area. Following close behind are the HU Berlin, the University of Bielefeld and the universities of Frankfurt and Constance, with amounts of between €7 and €9 million.

Whereas the Ludwig Maximilian University Munich was awarded large amounts of funding in all of the research fields in the social and behavioural sciences, it is above all in economics and the social sciences that the University of Mannheim stands out. The universities in Berlin (HU), Bonn and Frankfurt/Main must also be mentioned as central economics research institutions. The social sciences are represented primarily by the universities in Bielefeld, Bremen, Constance, Bamberg and Berlin (FU and HU). In the area of psychology, apart from the University of Munich, the universities in Constance, Tübingen, Giessen, Düsseldorf, Marburg, Jena, Heidelberg and Würzburg were awarded significant shares of DFG funding. The University of Bielefeld stands out particularly in education science.[8]

Unlike in the humanities, in the social and behavioural sciences, only a few eastern German universities have made it into the top group. The exceptions include the HU Berlin and the University of Jena. The coordinated programmes funded at these universities make a substantial contribution to this success. An example of this in Jena includes Collaborative Research Centre 580 "Social Developments after Structural Change — Discontinuity, Tradition, Structural Formation", which also integrates many researchers from the University of Halle-Wittenberg, Research Unit 481 "Discrimination

[6] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[7] During the study period, the DIW received particular funding from the DFG (just over €2.5 million) for the "German Socio-Economic Panel Study" (SOEP). Since 2003, SOEP has been receiving institutional funding from the federal and state governments (by decision of the Bund-Länder Commission for Educational Planning and Research Promotion; for more information see www.diw.de/deutsch/sop/uebersicht/index.html).

[8] The amount of funding that went to jurisprudence was too small for it to be evaluated from a ranking point of view.

Table 4-2:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in social and behavioural sciences

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Munich U	12.7	6.2	28.1	3.5	45.2	5.7	23	10.7	19	5.2	6	4.2	11
Mannheim U	10.0	11.2	13.2	5.1	22.3	8.6	6	13.5	6	6.8	6	8.5	5
Berlin HU	8.6	15.4	28.9	8.6	32.7	12.7	17	21.4	29	14.8	10	15.5	15
Bielefeld U	8.1	19.4	26.6	11.9	20.0	15.3	2	22.3	11	17.8	5	19.0	8
Frankfurt/Main U	7.8	23.3	17.1	14.0	26.1	18.6	13	28.4	16	22.1	4	21.8	4
Constance U	7.1	26.8	6.4	14.8	21.1	21.3	4	30.2	8	24.3	4	24.6	11
Bonn U	6.6	30.1	6.2	15.6	21.6	24.0	19	39.1	9	26.8	4	27.5	7
Berlin FU	6.2	33.1	18.6	17.9	25.4	27.3	13	45.1	38	37.2	7	32.4	12
Tübingen U	5.9	36.0	8.4	18.9	21.0	29.9	3	46.5	16	41.5	3	34.5	5
Heidelberg U	5.0	38.5	10.0	20.1	22.0	32.7	11	51.6	9	44.0	8	40.1	20
Jena U	4.9	40.9	10.5	21.4	16.9	34.9	0	51.6	6	45.6	3	42.3	4
Bremen U	4.9	43.3	16.7	23.5	9.6	36.1	3	53.0	6	47.3	2	43.7	5
Cologne U	4.6	45.6	18.2	25.7	30.4	40.0	15	60.0	11	50.3	2	45.1	2
Hamburg U	4.4	47.8	7.8	26.7	28.9	43.7	4	61.9	10	53.0	4	47.9	8
Bamberg U	4.4	49.9	6.3	27.5	10.8	45.0	1	62.3	n/a		2	49.3	1
Giessen U	4.3	52.0	6.0	28.2	10.5	46.4	7	65.6	4	54.1	6	53.5	16
Freiburg U	4.3	54.2	7.9	29.2	21.6	49.1	14	72.1	9	56.6	4	56.3	6
Osnabrück U	4.3	56.3	8.7	30.3	6.4	49.9	1	72.6	n/a		3	58.5	1
Göttingen U	4.3	58.4	7.6	31.2	19.7	52.4	6	75.3	6	58.2	1	59.2	1
Marburg U	3.8	60.2	9.4	32.3	10.5	53.8	2	76.3	7	60.1	4	62.0	4
Top 20 in total	**122.3**	**60.2**	**262.4**	**32.3**	**422.5**	**53.8**	**164**	**76.3**	**220**	**60.1**	**88**	**62.0**	–
Other HEIs	**80.7**	**39.8**	**549.2**	**67.7**	**363.1**	**46.2**	**51**	**23.7**	**146**	**39.9**	**54**	**38.0**	–
HEIs in total	**203.1**	**100.0**	**811.6**	**100.0**	**785.5**	**100.0**	**215**	**100.0**	**366**	**100.0**	**142**	**100.0**	–
Based on: N HEIs	**94**		**202**		**87**		**44**		**48**		**50**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Mannheim, Constance, Hamburg and Göttingen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

and Tolerance in Intergroup Relations" and Research Training Group 622 "Conflict and Cooperation between Groups". The Collaborative Research Centre integrates a broad array of humanities and social science-related disciplines, while the Research Unit and Research Training Group focus on social-psychological research questions.[9]

In relation to the number of reviewers consulted by the DFG between 2002 and 2004 for the written review process, Table 4-2 also shows a high correlation between ranking positions and the level of DFG funding awarded to the relevant HEIs (cf. Table A-19 and Table A-20 (non-university research institutions) in the appendix).

Fewer AvH- and DAAD-funded international researchers are drawn to Germany by the social and behavioural sciences than, as described above, by the humanities. The correspondingly lower number of visiting researchers is evidenced by the leading universities in this category. Nevertheless, there is also broad agreement here, at least for AvH funding recipients, with the DFG award ranking: 76% of social and behavioural scientists funded by the Humboldt Foundation completed their research stays at one of the 20 HEIs with the highest DFG funding. The field is spread a little wider for the DAAD, although here too there is a high level of concurrence in the leading group. Whereas the FU and HU Berlin are the institutions favoured by DAAD researchers, for AvH fellows and prizewinners the University of Munich is the "first address" for research in the social and behavioural sciences (ranked fourth at the DAAD), and the universities in Bonn and Cologne and the HU Berlin are also popular here.

With respect to the leading group, the data on total income from third-party funding, supplied by the HEIs for the official statistics and compiled by the Federal Statistical Office, show clear correlations with the statistics for DFG awards: Munich (U), Berlin (HU) and Bielefeld are also in leading positions here, while Mannheim and Frankfurt, which are both in the top DFG ranking group, follow with high values in ranking group 2 (11 to 20). However, differences are also apparent: the Federal Statistical Office, for example, places the universities of Tübingen and Bonn, which have leading positions in the DFG ranking, in very low ranking groups — this applies to most of the second ranking group (with the exception of Bremen and Cologne). In the case of the general third-party funding statistics, it is necessary to refer to a general data problem for Constance, Hamburg and Göttingen (cf. footnote 2 in Table 4-2). HEIs with a high ranking in the third-party funding statistics of the Federal Statistical Office include three universities, Stuttgart (third place), Bochum (fifth place) and Münster (sixth place), with subject profiles which are shaped primarily by the field of economics.[10]

The discrepancy between the indicators for DFG awards and international appeal, on the one hand, and figures for general third-party funding income, on the other, can be easily explained for the social and behavioural sciences. In this area, research is especially application-oriented and policy informing, and the market of funding bodies is correspondingly diverse. State ministries, local authorities, associations, unions, churches, business and industry contract studies in fields such as work and employment research, school research, market research and accompanying research in the areas of health and social services. These studies are frequently concerned with very practical questions, and the results seldom appear in specialist journals with international renown (cf. Hornbostel 2004, for the economics example) — which partially explains why it is rather those (DFG-funded) HEIs involved in basic research that are sought out by visiting researchers from abroad.

It is not only the market of funding bodies, but also the market of researchers that is large. This is also demonstrated by the number of HEIs, given in Table 4-2, that, according to the Federal Statistical Office, were awarded third-party funding during the study period. Between 2001 and 2003, more than 200 HEIs, including many universities of applied sciences, were awarded third-party funding for

[9] Further examples of coordinated programmes are available on the DFG website at www.dfg.de/en/research_funding/coordinated_programmes.

[10] The University of Stuttgart concentrates mainly on the business engineering sciences.

research in the social and behavioural sciences. This figure is much higher than for any other research area. With a total volume of almost €812 million in three years, this research area can easily hold its own against other subjects such as electrical engineering, computer science, systems engineering or physics.

To what extent do HEIs and non-university research institutions participate in the social and behavioural science-oriented coordinated programmes offered by the DFG? Altogether, these programmes are in less demand in the social and behavioural sciences than in the humanities. During the study period, 73 programmes focussing on this research area were funded, compared to 115 programmes in the humanities. Here too, the emphasis is on Research Training Groups (45), with participation as well in 17 Research Units, 10 Collaborative Research Centres (SFB) and one SFB Cultural Studies Research Centre.

The most intensive use of these programmes was by the HU Berlin, followed by Heidelberg and the FU Berlin (seven to ten participations). Munich, Giessen, Mannheim and Saarbrücken follow with six participations each. Going by the number of institutions with which HEI researchers cooperate in the context of DFG-funded coordinated programmes for the social and behavioural sciences, the universities of Heidelberg and Giessen and the HU Berlin have a particularly central position. Giessen mainly owes this position to its participation in programmes with a psychological focus.

Similar to the above-mentioned findings in the humanities, the visualisation of cooperative structures in the social and behavioural sciences shows well-established cross-institutional cooperation within the context of DFG-funded programmes above all for Berlin and the surrounding area (cf. www.dfg.de/ranking/ranking2006/netzwerke). The FU and HU Berlin participate jointly in many programmes, and social and behavioural scientists are also integrated from the Social Science Research Centre Berlin (WZB), the Max Planck Institute for Human Development and, with participation in two Research Training Groups, the Max Delbrück Centre for Molecular Medicine (MDC).

4.2 Comparison of Indicators in the Life Sciences

The scientific discipline "life sciences" is divided into three research areas:

- Biology
- Medicine
- Veterinary medicine, agriculture and forestry

The life sciences exemplify what has become increasingly significant with regard to DFG-funded research: interdisciplinary cooperation. Medical research, a prime example, is no longer restricted to clinics and medical faculties, but is now frequently found in biology- or natural sciences-oriented institutes and faculties. The fact that biological research has a particularly close relation to medicine accounts for the grouping of these areas (together with the third area mentioned above) in the DFG scientific discipline known as "life sciences".

With the implementation of the new review board system, the DFG has done justice to this multidisciplinary cooperation by establishing, among other things, Review Board 201 "foundations of biology and medicine". Proposals dealt with here are evaluated by review board members from different research areas: biochemists, cellular and molecular biologists, geneticists, biophysicians and biochemists, food scientists, anatomists and physiologists. For the analyses presented here and pursuant to consultations with the scientific officers, the review board was classified under the research area "biology".

The particular proximity of the research areas of biology and medicine, which was already indicated by the introductory profile analyses (cf. section 3.4), makes it necessary to include the neighbouring field in any interpretation of the results described below.

4.2.1 Biology

During the study period, 2002 and 2004, the DFG provided almost €591 million for projects with a primarily biological orientation. With 16% of the total budget, biology is thus the second largest DFG research area after medicine (20%). The funding is divided between 59 HEIs (almost €500 million) and 89 non-uni-

versity institutions (€87 million).[11] Non-university institutions thereby have an above-average level of activity in this area. The first such institution to be mentioned is the Max Planck Institute (MPI) of Biochemistry in Martinsried, which received more than 80% of its DFG funding for biological research. Scientists at the Max Delbrück Centre for Molecular Medicine (MDC), Berlin, were active to a similar extent, with two-thirds of their DFG funding being used for projects in biology. Substantial sums were also allocated to scientists at the MPI of Molecular Physiology in Dortmund, at the MPI of Biophysics in Frankfurt, at the MPI for Biophysical Chemistry in Göttingen, at the German Cancer Research Centre (DKFZ) and at the European Molecular Biology Laboratory (EMBL), both of which are in Heidelberg (cf. Table A-14 in the appendix).

HEI rankings in biology present a familiar picture when compared to the 2003 report: Munich (U), Würzburg and Heidelberg lead the field with amounts of between €28 and €38 million, followed by Freiburg, Göttingen and the HU Berlin with amounts of between €20 and €24 million (cf. Table A-8 for all HEIs covered in this study).

Würzburg's special position (in second place, as in the last ranking in biology) is not least due to the DFG Research Centre "Rudolf Virchow Center", established during the study period. In the DFG statistics, 45% of the funding allocated to this centre has been assigned to biology and 55% to medicine — the close relation between the two areas, as previously mentioned, is clearly visible here.

The great difficulty of drawing a clear boundary between biological and medical research is also to be seen in a consideration of the figures for third-party funding income supplied by the Federal Statistical Office: DFG awards and federal statistics on totals of third-party funding income both refer to a three-year period (although a different three years). It can generally be assumed that the amounts reported by the Federal Statistical Office should normally be higher than the figures relating solely to DFG awards. This is indeed the case in most of the other comparisons presented in this report. However, a different paradigm is evident in Table 4-3. For most of the HEIs listed there, the total incomes in biology are lower than the amounts reported for the DFG.

This cannot be fully explained by differences in the study period (DFG: 2002 to 2004; federal statistics: 2001 to 2003). This has much more to do with a methodological problem: at HEIs, the classification of income from third-party funding generally reflects the institution to which the scientists who were awarded this funding belong. At the DFG, the thematic focus of the project determines how it is classified. For example, decisions on biomedical projects are often made by review boards on the biology end of the spectrum, whereas the federal statistics frequently assign the same funds to medicine.

There are nevertheless many concurrences, in relation to the ranking group assignment of the HEIs under consideration, between the third-party funding statistics of the Federal Statistical Office and the DFG funding allocations. This can be explained by the fact, as illustrated by the profile analyses in chapter 3, that most of the HEIs active in the life sciences carry out research in "biology" and "medicine" and that the rankings of the two research areas differ only in individual (though characteristic) cases (cf. Table 4-4 for medicine).

These remarks show that the examination of a research area on its own, or the isolated study of third-party funding data from a single source, reveals only partial aspects of the relevant research behaviour. It is precisely here that the profile analyses presented above can come in use and that the variety of underlying data sources can be of advantage. They allow, among other things, the comparison of the results for biology presented here and for medicine, which follows in the next section, with figures relating to the biomedical programmes of the EU (FP6) and the German government (cf. section 4.5).

What picture is formed by the figures shown in Table 4-3?

Biologists from the international scientific community, whose research stays in Germany are funded by the AvH or the DAAD, are in agreement about five HEIs: Munich (U), Bonn, Tübingen, Ber-

[11] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-3:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in biology

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG-reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Munich U	37.8	7.6	16.7	3.3	40.1	6.0	18	7.4	13	4.5	13	4.2	28
Würzburg U	30.3	13.7	25.6	8.3	29.2	10.4	10	11.5	7	7.0	14	8.8	17
Heidelberg U	28.7	19.4	31.5	14.4	27.0	14.5	11	16.0	5	8.7	14	13.4	25
Freiburg U	23.8	24.2	22.9	18.9	24.4	18.2	14	21.7	7	11.1	8	16.0	16
Göttingen U	22.3	28.7	16.4	22.1	23.7	21.7	5	23.8	18	17.4	15	20.9	34
Berlin HU	20.3	32.7	12.1	24.5	18.9	24.6	11	28.3	16	23.0	22	28.1	44
Frankfurt/Main U	18.1	36.4	8.9	26.3	25.9	28.5	5	30.3	9	26.1	8	30.7	14
Cologne U	16.4	39.6	16.0	29.4	21.5	31.7	9	34.0	2	26.8	7	33.0	11
Tübingen U	16.1	42.9	19.4	33.2	24.1	35.3	12	38.9	10	30.3	9	35.9	23
Bonn U	15.3	46.0	12.6	35.7	21.3	38.5	12	43.9	11	34.1	11	39.5	14
Düsseldorf U	15.3	49.0	18.9	39.4	17.3	41.1	3	45.1	6	36.2	7	41.8	23
Berlin FU	15.2	52.1	10.2	41.4	22.1	44.5	5	47.1	13	40.8	20	48.4	44
Bochum U	14.5	55.0	19.1	45.1	16.2	46.9	5	49.2	2	41.5	10	51.6	9
Halle-Wittenberg U	13.7	57.7	10.5	47.2	14.1	49.0	2	50.0	6	43.6	6	53.6	17
Marburg U	13.7	60.5	11.2	49.4	17.5	51.7	6	52.5	3	44.6	8	56.2	30
Hamburg U	13.6	63.2	12.9	51.9	16.8	54.2	10	56.6	11	48.4	9	59.2	14
Munich TU	11.7	65.5	8.5	53.6	17.1	56.8	15	62.7	3	49.5	12	63.1	33
Münster U	11.1	67.8	9.6	55.4	19.4	59.7	7	65.6	11	53.3	3	64.1	6
Erlangen-Nuremberg U	10.6	69.9	9.8	57.4	13.7	61.7	4	67.2	2	54.0	5	65.7	19
Jena U	10.1	71.9	10.7	59.4	13.7	63.8	2	68.0	5	55.7	7	68.0	18
Top 20 in total	**358.5**	**71.9**	**303.8**	**59.4**	**424.1**	**63.8**	**166**	**68.0**	**160**	**55.7**	**208**	**68.0**	**–**
Other HEIs	**140.1**	**28.1**	**207.3**	**40.6**	**240.6**	**36.2**	**78**	**32.0**	**127**	**44.3**	**98**	**32.0**	**–**
HEIs in total	**498.6**	**100.0**	**511.1**	**100.0**	**664.7**	**100.0**	**244**	**100.0**	**287**	**100.0**	**306**	**100.0**	**–**
Based on: N HEIs	**59**		**75**		**64**		**45**		**46**		**54**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the „third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Göttingen, Halle-Wittenberg and Hamburg did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

lin (HU) and Hamburg count as the most popular host institutions for biologists from abroad in the statistics of both institutions. Whereas the AvH ranking list is headed by the Ludwig Maximilian University, which is a leading institution in some other respects too, DAAD-funded visiting researchers have a preference for Göttingen. Both institutions are positioned well in terms of DFG awards. The AvH figures are quite consistent with the ranking group assignments based on DFG funding: eight of the ten HEIs with the highest DFG funding are also leading the field of AvH institutions, while the remaining two follow in ranking group two (i. e. 11 to 20).

Biology is the research area with the largest number of DFG coordinated programmes; in no other area are Collaborative Research Centres, Research Training Groups and Research Units used to the same extent.

Between 2002 and 2004, 155 DFG programmes (not including Priority Programmes) with a biological thematic focus were being funded, including 83 Research Training Groups, 51 Collaborative Research Centres and 21 Research Units. A total of 112 institutions participated in these programmes, including 54 HEIs, 23 Max Plank institutes and working groups, 16 Leibniz institutes, 8 Helmholtz research centres and 2 Fraunhofer institutes.

The highest rates of participation are exhibited by the HU and FU Berlin, followed by Göttingen, Heidelberg, Würzburg and the two universities in Munich. The non-university research institutions with the highest level of participation in coordinated programmes in biology are the Max Delbrück Centre (MDC) in Berlin, the German Cancer Research Centre in Heidelberg, the MPI for Biophysical Chemistry in Göttingen and the Leibniz Institute for Molecular Pharmacology (FMP) in Berlin (not shown in the table).

With regard to the number of institutions with which the scientists of an HEI have cooperated in the context of biology-oriented DFG programmes, the two Berlin universities, FU and HU, are far ahead of the field, followed by Göttingen, the TU Munich, Marburg, Darmstadt, Munich (U) and Giessen.

Figure 4-2 shows the networks resulting from these joint participations in DFG-funded programmes. Due to the density of interaction and the technical difficulty of its presentation, the graph is limited to institutions with two or more programme participations. The diameter of the symbols indicates the number of participations and the links between institutions refer to the frequency of inter-institutional cooperation. Relationships based on at least two joint participations are shown. The positioning of the institutions is designed to reflect their actual geographical distribution.

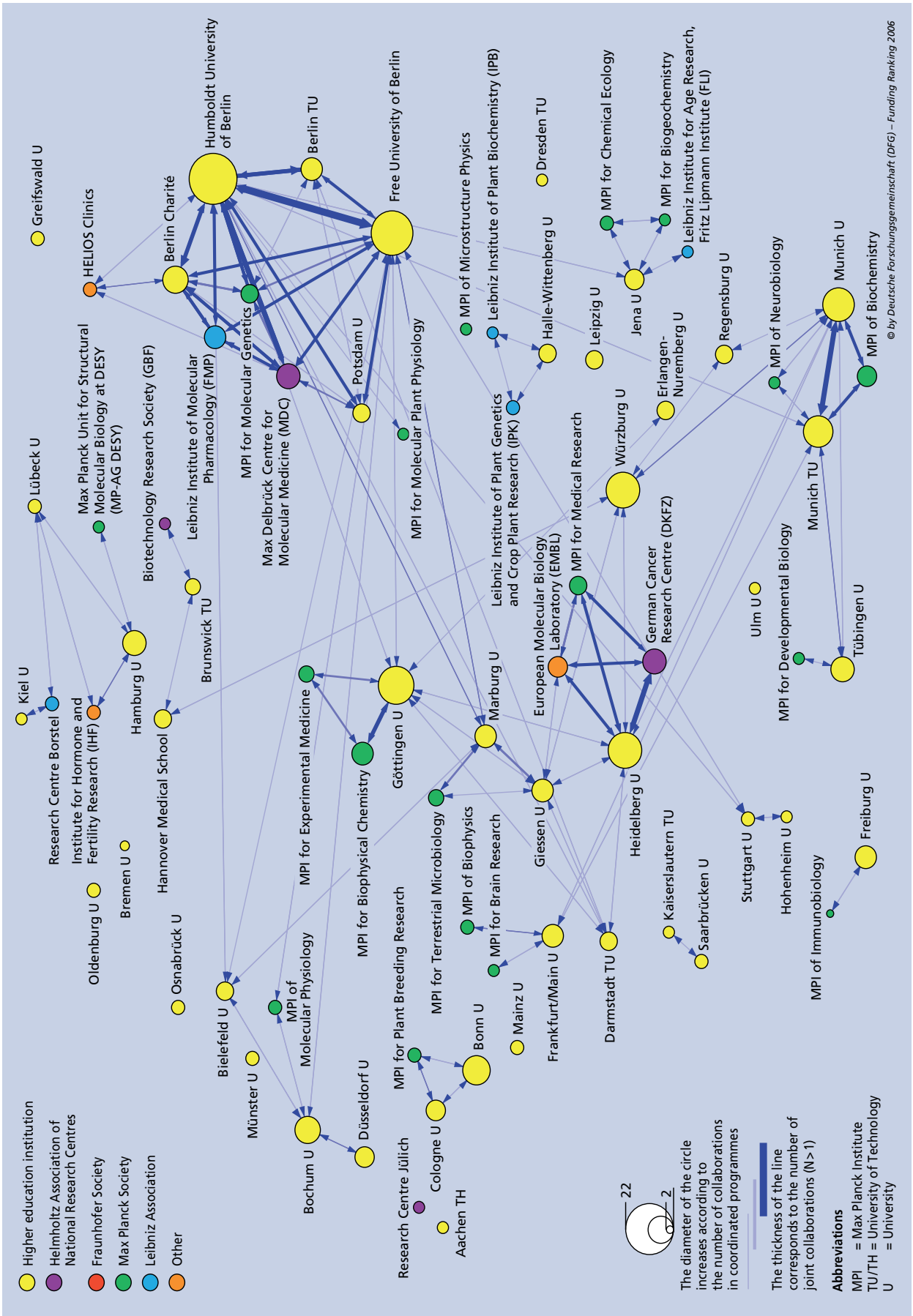
On the whole, the graph shows many large clusters, and there are densely organised cooperative networks in Berlin. The HU and FU Berlin and the Charité University Medical Centre Berlin (shown separately here), which is jointly run by these two universities, form the core of this research cluster. Furthermore, scientists from the TU Berlin, the University of Potsdam and the above-mentioned research institutions MDC, FMP and the MPI for Molecular Genetics are also integrated in the cluster.

There is a weak connection between this cluster and the other densely linked cluster around Munich. Here too, it has been possible, by means of DFG-funded coordinated programmes, to utilise the local resources for jointly undertaken research projects. The core is formed by the TU Munich, the U Munich and the MPI for Biochemistry in Martinsried, and the cluster also integrates the MPI for Neurobiology located near by. Furthermore, scientists in Frankfurt, Tübingen, Würzburg and Heidelberg were also involved in many cooperative relationships through DFG programmes in this research area.

The University of Heidelberg benefits primarily from the proximity of two internationally renowned research institutions, the European Molecular Biology Laboratory and the German Cancer Research Centre. Their focus on biomedical questions and the further close relationship to the MPI for Medical Research underlines the remarks above concerning the multidisciplinary character of the research grouped under the heading "biology" in this ranking. The strong emphasis on medicine-related questions is evident here too.

In addition to the cluster around Göttingen in southern Lower Saxony, another tightly woven network of cooperation has been established in Hesse between the universities in Marburg,

Figure 4-2:
Research institutions participating in DFG coordinated programmes and resulting collaborative relations in biology



Giessen and Darmstadt, with links to the "Heidelberg cluster" described above. In this case, as in other locations, it is primarily the Max Planck institutes that form the main block of non-university cooperation partners.

Würzburg (ranked second in DFG awards in this research area) cooperates, through a range of relationships, with scientists in the entire country: in the north with the Hannover Medical School, in the west with Giessen and Heidelberg, and in the south with Regensburg and Munich.

Finally, reference should be made to a cluster in the northern Germany between Hamburg, Lübeck, and Kiel, and to two eastern German clusters in Halle and Jena, who set their own priorities together with institutes of the Max Planck Society and the Leibniz Association.

4.2.2 Medicine

Between 2002 and 2004, the DFG granted approximately €727 million for research assigned to the research area of medicine. This corresponds to nearly 20% of the total budget. Medicine is therefore the largest of the research areas differentiated by the DFG. A total of 89% of this amount (€646 million) goes to 68 HEIs and 10% (€71 million) to 108 non-university research institutions.[12] Medicine is thus the research area with the highest number of non-university DFG funding recipients. The German Cancer Research Centre is the leading recipient of funding for medical projects, with almost half of the €13 million it receives going to research projects allocated to the area of medicine. A similarly large amount went to the Leibniz Centre for Medicine and Biosciences, the Borstel Research Centre (FZB). Other institutions with prominent shares include the Max Delbrück Centre for Molecular Medicine (MDC) and the MPI for Infection Biology (both in Berlin), the Research Centre for Environment and Health (GSF) based in Neuherberg, and the Society for Biotechnological Research (GBF) in Brunswick (cf. Table A-14 in the appendix).

A methodological problem, outlined in section 2.2.3, which has special significance for the research area of medicine, but which, to a lesser extent, also concerns biology and federal and EU funding indicators must be emphasised: with the growing number of university hospitals that have been privatised or transferred to new management, it is increasingly difficult to accurately classify the third-party funding received by these institutions. This applies in particular to the Charité in Berlin, which has been jointly run by the FU and HU Berlin since 2003, and incorporates the hospitals of both universities; but there are also classification problems in the case of the University Hospital of Schleswig-Holstein, which is run by the universities in Kiel and Lübeck. A 50-50 allocation has been carried out in this ranking with the figures given for these two institutions (cf. section 2.3.3).

In medicine, two universities have been at the top of the list since the DFG ranking first started: the University of Würzburg and the University of Munich. Although, in terms of their DFG awards, the two universities were approximately equal in the last Funding Ranking, the amount awarded to Würzburg, almost €51 million, is now significantly higher than that awarded to Munich (€37 million). The universities in Tübingen, Mainz, Berlin (HU), Heidelberg and Freiberg were awarded between €30 and €36 million in the period from 2002 to 2004 (cf. Table A-8 in the appendix for all HEIs covered by the study). The special position of Würzburg is accounted for primarily by the establishment of the DFG Research Centre "Rudolf Virchow Center for Experimental Biomedicine" — 55% of whose funding is assigned to medicine in the DFG statistics (cf. section 2.2).

The HEIs just mentioned also have prominent places in the DFG ranking for biology, as do most of the HEIs which follow in the list — a clear indication of the proximity of the two research areas (cf. section 4.2.1). Among the exceptions are the universities of Mainz and Ulm and the Hannover Medical School, which all place a relatively distinct emphasis on medical research in the narrower sense of the term. The amount of DFG funding allocated to biology at these locations is rather average for the HEIs considered.

A comparison with the data on third-party funding provided by the Federal Statistical Office shows a high level

[12] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-4:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in medicine

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Würzburg U	50.6	7.8	97.0	3.7	72.8	4.3	9	4.0	10	5.8	16	6.7	31
Munich U	36.9	13.5	213.0	11.8	92.4	9.7	20	12.9	10	11.6	17	13.8	21
Tübingen U	35.5	19.0	98.1	15.5	76.2	14.1	13	18.8	6	15.1	7	16.7	12
Mainz U	32.7	24.1	84.0	18.7	56.2	17.4	5	21.0	4	17.4	8	20.0	3
Berlin HU	31.8	29.0	198.3	26.2	56.5	20.7	15	27.7	10	23.3	13	25.4	24
Heidelberg U	31.2	33.8	153.9	32.1	89.0	25.9	8	31.3	14	31.4	13	30.8	16
Freiburg U	30.9	38.6	115.4	36.5	74.6	30.2	16	38.4	10	37.2	5	32.9	5
Erlangen-Nuremberg U	29.1	43.1	83.6	39.7	68.1	34.2	10	42.9	12	44.2	10	37.1	7
Hannover MedH	24.7	46.9	113.0	44.0	53.8	37.4	0	42.9	n/a		12	42.1	30
Bonn U	22.8	50.5	70.1	46.6	58.9	40.8	6	45.5	1	44.8	5	44.2	13
Berlin FU	22.4	53.9	76.6	49.5	58.2	44.2	6	48.2	8	49.4	11	48.8	21
Göttingen U	22.4	57.4	76.6	52.5	48.3	47.0	10	52.7	6	52.9	5	50.8	8
Ulm U	20.8	60.6	76.6	55.4	50.2	50.0	5	54.9	7	57.0	8	54.2	13
Munich TU	20.1	63.7	84.1	58.6	51.9	53.0	7	58.0	5	59.9	13	59.6	18
Münster U	19.6	66.7	82.5	61.7	54.5	56.2	5	60.3	5	62.8	5	61.7	10
Düsseldorf U	19.1	69.7	68.2	64.3	50.6	59.1	6	62.9	4	65.1	8	65.0	15
Marburg U	18.2	72.5	50.5	66.2	41.0	61.5	7	66.1	1	65.7	6	67.5	10
Cologne U	14.7	74.8	83.5	69.4	46.0	64.2	7	69.2	9	70.9	10	71.7	23
Hamburg U	14.1	77.0	78.1	72.4	52.6	67.3	7	72.3	6	74.4	5	73.8	12
Frankfurt/Main U	13.9	79.1	100.2	76.2	43.0	69.8	9	76.3	3	76.2	6	76.3	7
Top 20 in total	**511.5**	**79.1**	**2,003.1**	**76.2**	**1,194.5**	**69.8**	**171**	**76.3**	**131**	**76.2**	**183**	**76.3**	–
Other HEIs	**134.9**	**20.9**	**627.0**	**23.8**	**517.0**	**30.2**	**53**	**23.7**	**41**	**23.8**	**57**	**23.8**	–
HEIs in total	**646.4**	**100.0**	**2,630.1**	**100.0**	**1,711.6**	**100.0**	**224**	**100.0**	**172**	**100.0**	**240**	**100.0**	–
Based on: N HEIs	**68**		**38**		**71**		**39**		**35**		**47**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; MedH = Medical School; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Göttingen and Hamburg did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

of correlation with the DFG statistics.[13] Visiting researchers of the AvH and the DAAD also agree: seven HEIs are included in both of the lists of the top 10 highest ranked institutions.

Drawing on the indicators for the linking of institutions in networks of DFG-funded medical research, it can be seen that two HEIs in particular have an especially central position: scientists at the University of Würzburg and the Hannover Medical School have the "best contacts" to medical research at other German HEIs and non-university research institutions, based on the number of institutions with which they are involved in DFG-funded coordinated programmes. In both cases, this corresponds well with the other indicators.

The visualisation available on the internet (cf. www.dfg.de/ranking/ranking2006/netzwerke), which gives information on the regional distribution of institutions participating in the coordinated programmes of the DFG and, at the same time, shows the clusters with especially dense contact networks, reveals the concrete cooperative relations behind the totalled figures. As already seen for biology, HEIs and non-university institutions (and the MDC with particular intensity) in Berlin frequently participate together in DFG-funded programmes.

Similar close relations exist between the medicine-oriented research institutions around Munich, where, alongside the TU and U Munich, it is above all Max Planck institutes that participate in DFG-funded coordinated programmes (MPI for Neurobiology, MPI for Biochemistry, MPI for Psychiatry).

A similar pattern to that in biology is shown by the clusters around Heidelberg and around Göttingen, which integrates the MPI for Experimental Medicine and the MPI for Biophysical Chemistry as well as the German Primate Center (DPZ). However, cooperation around Hannover is more densely organised than was seen for biology, because in addition to the Medical School, the University of Veterinary Medicine and the University of Hannover, the cluster also integrates the University of Music and Theatre, the latter as a result of its participation in a Research Unit that studies the biomedical roots of language and music.[14] The central position of Würzburg — as in biology — is underlined once more by the fact that scientists at this location have, on the one hand, the highest number of participations in DFG-funded coordinated programmes, and, on the other, a large number of cooperation partners in the important research centres outside Würzburg (in Heidelberg and Berlin, for example).

4.2.3 Veterinary Medicine, Agriculture and Forestry

The research area "veterinary medicine, agriculture and forestry" (including horticulture) combines two areas which, in the last ranking, were considered separately: "veterinary medicine" and "agriculture and forestry". Even in this version, it is a comparatively small area: during the study period from 2002 to 2004, the DFG provided a total of €91 million. That equals 2.5% of the total budget (cf. Table 2-11). The amount was divided between 54 HEIs (€80 million) and 31 non-university research institutions (€11 million). Prominent non-university research institutions include the Research Institute for the Biology of Farm Animals (FBN) in Dummerstorf, the Federal Agricultural Research Centre (FAL) based in Brunswick, the Federal Research Institute for Animal Health (Friedrich-Loeffler-Institute, FLI) on the island of Riems, and the Leibniz Centre for Agricultural Landscape Research (ZALF) in Müncheberg (cf. Table A-14 in the appendix).

Similarly large amounts were awarded in this research area to scientists at the universities in Giessen and Hohenheim, with more than €10 million in each case during the three-year period. These are followed by the universities in Göttingen, Munich (TU) and Hannover (TiHo), with

[13] As explained in section 4.2.1 an exact differentiation of biology and medicine is not possible. This also affects the comparison of DFG awards and the total third-party funding data from the Federal Statistical Office. One example illustrates the extent of the deviation: according to DFG figures, life sciences research at the Hannover Medical School is divided between the three research areas, "biology", "medicine" and "veterinary medicine, agriculture and forestry", in a proportion of 22:75:3; however, according to Federal Statistical Office, this is a purely medical research university, i. e. 100% of the third-party funding granted to this university is allocated to medical research in the narrower sense of the term.

[14] Research Unit 499: Acoustic Communication of Emotions in Nonhuman Mammals and Man: Production, Perception and Neuronal Processing (including scientists from medicine, linguistics, psychology, zoology and music physiology).

Table 4-5:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in veterinary medicine, agriculture and forestry

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Giessen U	10.6	13.2	24.0	8.4	24.3	7.6	7	9.2	34	12.4	4	7.5	7
Hohenheim U	10.0	25.8	35.2	20.7	27.6	16.2	14	27.6	43	28.0	5	17.0	10
Göttingen U	8.9	36.9	29.0	30.9	29.8	25.5	11	42.1	40	42.5	4	24.5	7
Munich TU	6.9	45.6	45.0	46.7	27.9	34.2	6	50.0	8	45.5	4	32.1	13
Hannover TiHo	5.5	52.5	14.9	51.9	11.3	37.8	0	50.0	n/a		2	35.8	5
Kiel U	3.8	57.2	11.1	55.8	15.4	42.6	7	59.2	10	49.1	3	41.5	11
Munich U	3.0	61.0	7.5	58.4	12.4	46.5	3	63.2	3	50.2	2	45.3	5
Halle-Wittenberg U	2.9	64.6	9.5	61.8	10.1	49.6	2	65.8	14	55.3	2	49.1	6
Hannover U	2.8	68.1	8.1	64.6	14.1	54.0	0	65.8	8	58.2	3	54.7	10
Berlin FU	2.4	71.0	6.1	66.7	10.1	57.2	4	71.1	6	60.4	3	60.4	5
Berlin TU	2.2	73.9	9.4	70.1	6.7	59.3	1	72.4	4	61.8	2	64.2	4
Bayreuth U	2.1	76.4	0.0	70.1	5.6	61.0	1	73.7	4	63.3	1	66.0	0
Bonn U	2.0	79.0	11.6	74.1	20.6	67.4	8	84.2	12	67.6	2	69.8	2
Berlin HU	1.9	81.4	5.1	75.9	10.8	70.8	2	86.8	21	75.3	1	71.7	1
Dresden TU	1.5	83.3	12.2	80.2	6.1	72.7	0	86.8	8	78.2	1	73.6	5
Cottbus TU	1.3	84.8	0.0	80.2	2.1	73.3	0	86.8	n/a		2	77.4	5
Freiburg U	1.2	86.3	14.3	85.2	7.3	75.6	0	86.8	7	80.7	1	79.2	6
Rostock U	1.0	87.6	5.3	87.0	3.0	76.5	0	86.8	9	84.0	0	79.2	0
Brunswick TU	0.9	88.7	0.0	87.0	5.2	78.2	2	89.5	1	84.4	1	81.1	6
Hannover MedH	0.9	89.8	0.0	87.0	1.0	78.5	0	89.5	n/a		2	84.9	5
Top 20 in total	**71.8**	**89.8**	**248.4**	**87.0**	**251.1**	**78.5**	**68**	**89.5**	**232**	**84.4**	**45**	**84.9**	**–**
Other HEIs	**8.1**	**10.2**	**37.0**	**13.0**	**68.8**	**21.5**	**8**	**10.5**	**43**	**15.6**	**8**	**15.1**	**–**
HEIs in total	**79.9**	**100.0**	**285.4**	**100.0**	**319.9**	**100.0**	**76**	**100.0**	**275**	**100.0**	**53**	**100.0**	**–**
Based on: N HEIs	**54**		**41**		**63**		**21**		**32**		**26**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; MedH = Medical School; TiHo = University of Veterinary Medicine; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Hohenheim, Göttingen, Kiel, Halle-Wittenberg and Hannover did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

amounts ranging from €5 to €9 million (cf. Table A-8 in the appendix for all HEIs covered in this study). It should be pointed out that both Göttingen and Munich also have well-endowed budgets for medicine and for general biology. In keeping with the chosen specialisations of the University of Hohenheim and the University of Veterinary Medicine in Hannover, the amount of funding they were granted in this research area is more than that received for either medicine or biology. In Giessen, however, the three amounts are relatively well balanced (biology: €9 million; medicine: €14 million; veterinary medicine, agriculture and forestry: €11 million). That means that the entire spectrum of the life sciences is given relatively uniform coverage here.

Taking the Federal Statistical Office's figures for total income from third-party funding as the standard, the order of rank is led by the universities in Munich (TU), Hohenheim, Göttingen and Giessen; the figures for the leading group are thus quite consistent with those just listed for DFG awards. This can also be seen in the fact that seven of the ten HEIs with the highest DFG funding are present in this "top 10". However, data gaps must also be pointed out for certain HEIs in the second group: in the case of the Medical School in Hannover, as mentioned, which assigns all of its third-party income to "medicine" (cf. section 4.2.2, footnote 13), or the universities of Bayreuth, Cottbus and Brunswick, whose third-party funding was reported to the Federal Statistical Office without sufficient differentiation.

The research area "veterinary medicine, agriculture and forestry" is represented by relatively few higher education institutions. Visiting researchers from abroad are familiar with these locations: eight HEIs belong to the top ten most popular HEIs among visiting researchers funded by the AvH and by the DAAD. There are also conspicuous differences between the two funding bodies regarding the number of scientists funded. Whereas Hohenheim and Göttingen owe their top positions to only 14 and 11 stays by visiting researchers from the AvH respectively, the DAAD funded 43 and 40 scientists at these important research centres for this research area. One explanation for this is provided, in part, by the development policy interests of the DAAD, in accordance with which it primarily funds research stays in this field (cf. section 2.4).

Coordinated programmes play a subordinate role in this rather small area. A total of 10 Research Units, 11 Research Training Groups and 5 Collaborative Research Centres were active during the study period from 2002 to 2004 — in some cases, with broad participation from different institutions. An example is Research Unit 496 (the "poplar group"), the project leaders of which are distributed among six HEIs (cf. www.pappelgruppe.de). A visualisation of participations in DFG-funded programmes can be found at www.dfg.de/ranking/ranking2006/netzwerke.

On the whole, it can be stated that this research area is concentrated in a small number of HEIs. The five institutions with the most DFG funding already account for 50% of all DFG funding awards in this area. The pattern is similar for the other indicators considered here. Non-university institutions that have specialised on the research fields in this area altogether have a predominant weight in veterinary medicine, agriculture and forestry.

4.3 Indicator Comparison for the Natural Sciences

The research areas combined in this scientific discipline are chemistry, physics, mathematics and the geosciences. The restructuring of the DFG peer review system from review committees to review boards resulted in a change of layout, above all, for the geosciences. Geography, which was previously classified as a social science, has been assigned to this group since 2004. During the study period, from 2002 to 2004, the DFG granted more than €934 million for research in the natural sciences, with the largest share of over €350 million going to physics (cf. Table 2-11 in section 2).

4.3.1 Chemistry

From 2002 to 2004, the DFG provided a total of €261 million for the projects classified under "chemistry" (7% of the total funding volume). This funding was used for research projects at 65 HEIs (€231

million) and 63 non-university research institutions (€27 million).[15] Non-university research institutions involved to a larger extent in DFG projects in this area included the Leibniz Institute of Polymer Research (IPF) in Dresden, the MPI for Coal Research in Mülheim on the Ruhr, the Institute for Composite Materials (IVW) in Kaiserslautern, the MPI for Colloids and Interfaces in Golm, the MPI for Polymer Research in Mainz, the Fritz Haber Institute of the Max Planck Society in Berlin and the Institute of Plastics Processing (IKV) in Aachen (cf. Table A14 in the appendix).

The 20 largest recipients of DFG funding in chemistry account for 65% of all DFG funding in this area. The Technical University of Karlsruhe (TH) is at the head of the list (ranked second in 2003); at this university, the funding allocated to chemistry, in the narrower sense of the term,[16] amounted to almost €14 million. In comparison with 2003, the University of Erlangen-Nuremberg has managed to double its funding intake, and is now ranked second with over €11 million.[17] Also over the €10 million mark is the University of Münster (cf. Table A-8 for all HEIs covered in this study).

With regard to the number of scientists who prepared written reviews for the DFG during the study period, the TU Munich was at the top of table, with 23 chemistry reviewers in three years. A high number of reviewers, either 13 or 14, were also recorded for the universities in Heidelberg, Stuttgart, Freiburg, Marburg and Darmstadt. Six other HEIs follow with 12 reviewers each; in other words, the differences between the HEIs coming after the TU Munich are minor.

Chemistry is one of the main research areas among visiting researchers funded by the AvH; more than 18% of all research stays in Germany were completed by chemists. The TU Munich is by far the most popular destination for these visiting researchers from abroad, followed by Göttingen, Heidelberg and Erlangen-Nuremberg. Seven of the HEIs with the highest DFG funding are also in the first ranking group of AvH HEIs, and the remaining three follow immediately in the second ranking group (i.e. 11 to 20).[18]

One of the rare cases in which a ranking has reached unexpected results occurs in relation to chemistry and DAAD-funded research stays. Although the TH Karlsruhe is at the top for both research stays and DFG awards, and Bayreuth and Freiburg are in the leading group of both rankings, the results deviate in every other case.

According to the figures on general third-party funding income, as submitted to the Federal Statistical Office, the TU Munich is in first place, followed by the universities in Mainz, Munich (U), Münster and the TU Berlin (cf. Table A-7 in the appendix). The University of Karlsruhe, which occupies first place in the DFG ranking, is here listed in the third ranking group, and Erlangen-Nuremberg also has a less prominent position in the figures by the Federal Statistical Office.

This result is caused once more by blurred subject boundaries: for both of these universities (and almost in the case of Ulm and the FU Berlin), the reported figures for total third-party funding income in three years are lower than the amounts awarded by the DFG in three years (although different three-year period). It must be assumed that divergent subject classification is in operation here.

Another explanation for the conspicuous deviations in this table is offered by the analyses by the Centre for University Development (CHE). They confirm that the proportion of the total third-party funding income in chemistry that is made up by DFG awards deviates widely from one HEI to the next. An average DFG share of 44% was documented in a 2003 survey, which covered 52 HEIs for a study period of three years. In Giessen and Bonn, the figure was well above average (over 80%), and well below average in

[15] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[16] In the chemistry-related research area "thermal and process engineering", the TH Karlsruhe, with €13 million, received the second highest amount, after Aachen (€15 million) (cf. section 4.4.2).

[17] A high share of this is accounted for by the Collaborative Research Centre "Redox-Active Metal Complexes: Control of Reactivity via Molecular Architecture" established at the end of 2001 (€3.3 million in three years).

[18] Among the non-university research institutions with substantial DFG funding in chemistry, those which are frequently visited by AvH-funded international researchers include the Fritz Haber Institute, the MPI for Coal Research, the MPI of Colloids and Interfaces and the MPI for Polymer Research (cf. AvH 2006: p. 17).

Table 4-6:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in chemistry

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Karlsruhe TH	13.8	5.9	8.1	1.9	12.3	2.7	15	2.3	16	6.8	3	2.5	7
Erlangen-Nuremberg U	11.3	10.8	10.9	4.4	9.8	4.9	29	6.8	4	8.5	3	5.0	3
Münster U	10.0	15.2	16.2	8.1	12.2	7.6	20	9.9	6	11.0	5	9.1	6
Heidelberg U	8.8	19.0	14.8	11.5	14.5	10.9	31	14.7	4	12.7	2	10.7	2
Aachen TH	8.7	22.8	13.9	14.7	12.1	13.6	23	18.2	3	14.0	6	15.7	5
Munich TU	8.6	26.5	28.7	21.3	22.8	18.6	66	28.4	4	15.7	2	17.4	4
Göttingen U	7.5	29.7	10.4	23.6	11.3	21.2	39	34.4	7	18.6	4	20.7	4
Bayreuth U	7.4	32.9	9.4	25.8	10.9	23.6	10	36.0	8	22.0	1	21.5	0
Freiburg U	7.3	36.1	12.7	28.7	13.5	26.6	11	37.7	9	25.8	3	24.0	2
Munich U	7.3	39.2	17.3	32.7	12.4	29.4	28	42.0	2	26.7	2	25.6	4
Ulm U	7.2	42.3	7.7	34.5	9.3	31.4	24	45.7	8	30.1	3	28.1	5
Bonn U	7.0	45.3	14.5	37.8	10.7	33.8	15	48.0	8	33.5	4	31.4	2
Stuttgart U	6.6	48.2	13.9	41.0	13.9	36.9	13	50.0	2	34.3	2	33.1	4
Mainz U	6.3	51.0	23.3	46.4	11.3	39.4	15	52.3	5	36.4	5	37.2	8
Berlin FU	6.2	53.7	6.6	47.9	12.0	42.1	28	56.6	5	38.6	5	41.3	12
Würzburg U	5.6	56.1	9.3	50.0	9.6	44.2	21	59.9	9	42.4	3	43.8	4
Dresden TU	5.1	58.3	9.8	52.3	9.3	46.3	11	61.6	7	45.3	4	47.1	6
Berlin TU	5.0	60.5	15.2	55.7	9.8	48.5	11	63.3	5	47.5	4	50.4	10
Leipzig U	4.9	62.6	7.7	57.5	6.6	50.0	10	64.8	10	51.7	3	52.9	1
Cologne U	4.8	64.7	6.7	59.1	11.2	52.4	9	66.2	0	51.7	1	53.7	5
Top 20 in total	**149.6**	**64.7**	**257.3**	**59.1**	**235.2**	**52.4**	**429**	**66.2**	**122**	**51.7**	**65**	**53.7**	**–**
Other HEIs	**81.7**	**35.3**	**178.4**	**40.9**	**213.3**	**47.6**	**219**	**33.8**	**114**	**48.3**	**56**	**46.3**	**–**
HEIs in total	**231.2**	**100.0**	**435.7**	**100.0**	**448.5**	**100.0**	**648**	**100.0**	**236**	**100.0**	**121**	**100.0**	**–**
Based on: N HEIs	**65**		**77**		**61**		**50**		**45**		**45**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other

Abbreviations:

FU = Free University; HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Göttingen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

Constance, Paderborn, Potsdam, Wuppertal and Brunswick (less than 20%). The TU Munich was also by far the highest funded HEI in the CHE survey, according to which it received twice as much third-party funding income as the HEIs following it in the list. The survey reported an above-average proportion of state funding (26%) and a below average proportion of DFG funding (less than 30%) for this institution (cf. CHE 2003: p. 43). The TH Karlsruhe was also found to be in the top five HEIs by the CHE survey.

These differences in the "weighting" of DFG funding, which, according to the CHE survey, are more prominent in chemistry than in other research areas, are a further cause of the differences in this research area between DFG awards, on the one hand, and the data on third-party funding provided by the Federal Statistical Office, on the other.[19]

Highly centralised local research networks, defined in terms of the number of partner institutions with which a university cooperated in the context of selected DFG-funded coordinated programmes between 2002 and 2004, are evidenced by the three Berlin universities and by the technical universities in Dresden and Darmstadt. The universities in Jena, Marburg, Mainz and Frankfurt on the Main must also be mentioned. Among the non-university research institutions, it is above all the Research Centre Jülich that is a frequent participant in DFG-funded chemistry programmes. The Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI) in Berlin, and the MPI for Polymer Research in Mainz should also be named.

The visualisation of research networks in chemistry, which is published on the Funding Ranking internet site (www.dfg.de/ranking/ranking2006/netzwerke), shows the institutions and the relationships between them resulting from multiple joint participations in DFG coordinated programmes.

[19] The CHE compared the placing of HEIs in the DFG's 2003 ranking with their placing in the ranking based on the CHE survey of HEI faculties. The level of correlation in chemistry was quite high (correlation .79), but below that of subjects such as medicine (.93) and mathematics (.94) (CHE 2003: p. 163). DFG funding in chemistry therefore also includes research conducted outside chemistry departments and institutions with a primary focus on chemistry.

4.3.2 Physics

During the study period from 2002 to 2004, the total DFG funding for projects and individuals in the research area of physics amounted to €351 million. In terms of DFG funding, physics is thus the third-largest research area after medicine and biology. These funds are divided between 62 HEIs (€307 million) and 59 non-university institutions (€42 million).[20] The list of non-university physics institutes with the highest funding is led by the Leibniz Institute for Solid State and Materials Research (IFW)[21] in Dresden, the Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI) in Berlin, the MPI for Solid State Research in Stuttgart, the MPI for Gravitational Physics (Albert Einstein Institute) in Golm, the Physikalisch-Technische Bundesanstalt based in Brunswick, the Fritz Haber Institute of the Max Planck Society in Berlin, which is also very active in chemistry, and the Research Centre Jülich (cf. Table A-14 in the appendix).

As in the case of chemistry, the leading university here is the TH Karlsruhe. Considering its second place in the geosciences, this institution can be named as one of Germany's leading natural sciences HEIs in terms of DFG funding.[22]

Largely responsible for this stable place at the top of the table (in the last ranking Karlsruhe was also ranked first with a volume of €14 million) is the DFG Research Centre "Functional Nanostructures", established in 2001. Predominantly physics-related research is undertaken at this centre by scientists who specialise in inorganic chemistry, solid state and surface physics, optics, physical chemistry, polymer chemistry and chemical engineering, quantum electronics and electrical engineering materials research. From 2002 to 2004, the DFG provided over €16 million to the TH Karlsruhe for this research centre — in the statistics on which this report is based, 53% of

[20] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[21] The project participations of the IFW are divided among five research areas. In addition to physics, the institute also received substantial funding on projects with a primary focus on materials science (cf. Table A-14 in the appendix).

[22] In this context, please refer to the figures given in section 4.5 for participation in relevant federal and EU programmes.

Table 4-7:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in physics

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Karlsruhe TH	16.8	5.5	13.4	2.0	9.4	1.7	25	3.8	8	4.0	4	2.2	1
Hamburg U	13.0	9.7	8.4	3.3	16.1	4.6	26	7.8	4	6.1	4	4.3	2
Berlin FU	11.4	13.4	8.2	4.6	10.4	6.5	19	10.8	8	10.1	4	6.5	13
Munich TU	11.0	17.0	45.3	11.5	17.9	9.7	34	16.0	4	12.1	7	10.3	14
Munich U	10.7	20.5	23.1	15.1	20.5	13.4	29	20.4	7	15.7	7	14.1	11
Duisburg-Essen U	10.7	24.0	11.4	16.8	16.4	16.3	9	21.8	1	16.2	6	17.3	9
Mainz U	10.2	27.3	18.2	19.6	13.9	18.8	20	24.9	2	17.2	5	20.0	5
Constance U	10.1	30.6	10.8	21.2	8.3	20.3	10	26.4	7	20.7	4	22.2	9
Berlin HU	9.9	33.8	14.5	23.5	9.6	22.0	17	29.0	13	27.3	9	27.0	19
Bochum U	9.3	36.9	17.2	26.1	16.1	24.9	18	31.8	9	31.8	10	32.4	8
Hannover U	9.0	39.8	6.2	27.0	7.5	26.3	11	33.5	2	32.8	3	34.1	2
Cologne U	8.6	42.6	17.5	29.7	13.9	28.8	12	35.3	3	34.3	3	35.7	6
Heidelberg U	8.5	45.4	26.6	33.8	22.4	32.8	25	39.2	9	38.9	6	38.9	8
Erlangen-Nuremberg U	8.3	48.1	16.4	36.3	19.6	36.3	25	43.0	3	40.4	2	40.0	3
Göttingen U	7.9	50.6	9.0	37.7	16.5	39.3	10	44.5	3	41.9	1	40.5	0
Regensburg U	7.5	53.1	8.7	39.0	11.4	41.4	13	46.5	0	41.9	5	43.2	7
Bonn U	7.1	55.4	19.5	42.0	21.2	45.2	26	50.5	2	42.9	5	45.9	5
Dresden TU	7.0	57.7	13.8	44.1	8.7	46.7	14	52.7	11	48.5	5	48.6	9
Tübingen U	6.8	59.9	15.4	46.4	11.5	48.8	7	53.8	3	50.0	4	50.8	7
Würzburg U	6.4	62.0	19.0	49.3	16.8	51.8	13	55.8	0	50.0	5	53.5	15
Top 20 in total	**190.3**	**62.0**	**322.4**	**49.3**	**288.1**	**51.8**	**363**	**55.8**	**99**	**50.0**	**99**	**53.5**	**–**
Other HEIs	**116.7**	**38.0**	**330.9**	**50.7**	**267.9**	**48.2**	**288**	**44.2**	**99**	**50.0**	**86**	**46.5**	**–**
HEIs in total	**307.0**	**100.0**	**653.3**	**100.0**	**556.0**	**100.0**	**651**	**100.0**	**198**	**100.0**	**185**	**100.0**	**–**
Based on: N HEIs	**62**		**74**		**65**		**55**		**42**		**56**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Hamburg, Constance, Hannover and Göttingen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

this amount was assigned to the research area of physics.

The University of Hamburg is ranked second with €13 million, and third place is taken by the FU Berlin with €11 million. Following close behind are the two universities in Munich and the universities in Duisburg-Essen, Mainz and Constance, with totals of between €10 and €11 million (cf. Table A-8 in the appendix for all HEIs covered in this study).

With regard to third-party funding income in physics, the figures provided by the Federal Statistical Office present a distinctly different picture. Here, the TU Munich is far ahead of the field, followed by the universities in Heidelberg, Munich, Bremen and Jena. For some HEIs, the differences are caused by data problems (cf. footnote 2 in Table 4-7). Furthermore, it is evident here that research area classification at the DFG is generally based on the thematic focus of particular projects (and is the funding provided for these projects), whereas the classification of third-party funding income, as reported to the Federal Statistical Office, most often refers to the general subject area of the institutes that received funding for the particular projects.

A further explanation for the differences is offered by the profile analyses presented in chapter 3. There it was shown that the above-mentioned HEIs, with an especially high level of third-party funding, generally receive large amounts of funding for cost-intensive research in the federal funding area "large-scale equipment for basic research". This consists to a large extent in physics-related fields of research such as condensed matter, the structure and interaction of elementary particles, as well as research in mathematics, astrophysics, hadron physics and nuclear physics. In the case of Jena, a high level of federal funding in the area of "physical and chemical technologies" and in particular in relation to optical technologies should also be mentioned (cf. section 4.5 and Table A-15 in the appendix).

As federal funding generally takes an above-average role in physics-related fields of research, and funding for basic research in physics by the DFG and the German government is complementary (for example, extensive BMBF funding in the area of "large-scale equipment for basic research", on the one hand, and less cost-intensive DFG funding of particular scientific topics, on the other), it is important in any interpretation of the DFG-ranking in physics to take other relevant third-party funding incomes into account, especially federal funding in the area of "large-scale equipment for basic research". Section 4.5 picks up this question, in a comparison of the HEIs that participate in this programme with the more active DFG institutions presented here.

With regard to the interest that German HEIs hold for international physics researchers, a comparison between AvH- and DAAD-funded visiting researchers reveals some differences. AvH-funded researchers prefer HEIs in Frankfurt (42 research stays), the two universities in Munich (TU: 34; U: 29) and the universities in Bonn and Hamburg (26 each). These figures correspond clearly with the data on DFG awards.[23] However, the DAAD, with significantly lower figures in this area, sends its researchers predominantly to the HU Berlin, Darmstadt, Dresden, Heidelberg and Bochum.

As far as participation in DFG-funded coordinated physics programmes is concerned, the two universities with the most DFG funding, Karlsruhe and Hamburg, have relatively weak connections with regional and national DFG programmes. Cooperation is rather intra-institutional. However, there seem to be tightly linked relations between institutions around Berlin, between Bochum, Duisburg-Essen and Wuppertal, and in the regions of Munich, Heidelberg and Dresden. Several non-university research institutions are integrated in DFG-funded physics programmes, in particular, the institutes of the Max Planck Society and of the Leibniz Association (cf. www.dfg.de/ranking/ranking2006/netzwerke).

[23] Among the non-university research institutions actively involved in DFG physics programmes, those which are frequently visited by AvH-funded international researchers include the Leibniz Institute for Solid State and Materials Research in Dresden, the MPI for Solid State Research in Stuttgart, the MPI for Gravitational Physics (Albert Einstein Institute) in Golm, the Fritz Haber Institute in Berlin, and the Research Centre Jülich. According to the figures released by the AvH, the last two institutions mentioned are at the top of the first ranking group of non-university host institutions (cf. AvH 2006: p. 17).

Table 4-8:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in mathematics

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Berlin TU	10.8	11.4	16.2	7.8	8.3	2.7	10	4.1	4	2.9	6	8.1	6
Berlin HU	6.4	18.2	6.0	10.7	7.5	5.1	16	10.7	8	8.6	8	18.9	11
Heidelberg U	5.9	24.4	12.9	16.9	12.0	8.9	6	13.1	3	10.7	4	24.3	2
Münster U	5.1	29.9	4.3	18.9	9.0	11.8	3	14.3	2	12.1	2	27.0	2
Bonn U	4.7	34.9	7.0	22.3	15.8	16.9	11	18.9	3	14.3	2	29.7	2
Berlin FU	4.5	39.6	42.7	42.8	6.9	19.1	6	21.3	6	18.6	3	33.8	6
Duisburg-Essen U	3.8	43.6	1.8	43.7	10.4	22.5	5	23.4	3	20.7	1	35.1	3
Munich TU	3.7	47.5	4.7	46.0	7.6	24.9	10	27.5	3	22.9	3	39.2	7
Aachen TH	3.3	51.0	5.6	48.7	10.6	28.3	2	28.3	4	25.7	2	41.9	1
Bielefeld U	2.9	54.1	3.9	50.5	11.0	31.9	16	34.8	5	29.3	4	47.3	4
Freiburg U	2.9	57.1	2.5	51.7	8.4	34.6	3	36.1	0	29.3	3	51.4	2
Chemnitz TU	2.5	59.7	1.4	52.4	5.1	36.2	2	36.9	n/a		1	52.7	1
Stuttgart U	2.4	62.3	1.0	52.9	4.2	37.6	11	41.4	4	32.1	1	54.1	2
Tübingen U	2.4	64.8	6.6	56.1	5.5	39.4	7	44.3	2	33.6	0	54.1	0
Bochum U	2.1	67.0	2.1	57.1	6.8	41.6	2	45.1	4	36.4	1	55.4	3
Kaiserslautern TU	2.0	69.1	5.1	59.6	7.8	44.1	3	46.3	n/a		1	56.8	0
Paderborn U	1.9	71.1	3.1	61.1	5.2	45.7	6	48.8	n/a		1	58.1	0
Dortmund U	1.9	73.1	5.9	63.9	4.5	47.2	1	49.2	3	38.6	3	62.2	3
Göttingen U	1.6	74.8	1.3	64.6	6.6	49.3	3	50.4	2	40.0	3	66.2	1
Erlangen-Nuremberg U	1.5	76.4	1.2	65.1	8.1	51.9	8	53.7	3	42.1	1	67.6	3
Top 20 in total	**72.4**	**76.4**	**135.5**	**65.1**	**161.2**	**51.9**	**131**	**53.7**	**59**	**42.1**	**50**	**67.6**	**–**
Other HEIs	**22.3**	**23.6**	**72.5**	**34.9**	**149.3**	**48.1**	**113**	**46.3**	**81**	**57.9**	**24**	**32.4**	**–**
HEIs in total	**94.7**	**100.0**	**208.0**	**100.0**	**310.4**	**100.0**	**244**	**100.0**	**140**	**100.0**	**74**	**100.0**	**–**
Based on: N HEIs	**67**		**89**		**65**		**54**		**42**		**38**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Göttingen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

4.3.3 Mathematics

From 2002 to 2004, the DFG awarded €103 million for research projects in the research area of mathematics. The funds were divided between researchers at 67 HEIs (€95 million) and 10 non-university research institutions (€7 million).[24] In a comparison of research areas, non-university research institutions thus show below-average participation in DFG-funded research projects in this category. Examples include the Konrad Zuse Institute for Information Technology (ZIB) and the Weierstrass Institute for Applied Analysis and Stochastics (WIAS), both in Berlin, as well as the MPI for Mathematics in the Sciences in Leipzig (cf. Table A-14 in the appendix).

Comparatively lower sums are awarded to each HEI in this area. The university with the highest funding — the TU Berlin — received just over €10 million for mathematical research in three years. The HU Berlin, with €6.4 million, was ranked second, followed by Heidelberg, Münster, Bonn, and the FU Berlin. In total, the ten mathematics HEIs with the highest DFG funding account for 54% of all funding in this area, and the top 20 account for a share of 76% (cf. Table A-8 in the appendix for all HEIs covered in this study).

The particular weight of Berlin universities has one main explanation: the DFG Research Centre "Matheon", which has received an annual sum of about €5 million from the DFG since 2002. The universities in Berlin were already in the top-ten mathematics universities in the last ranking (study period 1999 to 2001). But with the new research centre, this leading position has been reinforced.

The data reported to the Federal Statistical Office on third-party funding income in mathematics also puts the FU Berlin (with a clear lead) and the TU Berlin well ahead of the field (ranked first and second); the HU Berlin is likewise found in the first ranking group (i. e. places 1-10). Other HEIs listed here include Heidelberg, Karlsruhe, Bonn, Tübingen, Dortmund and Aachen. Deviations from the figures for DFG funding are evident, for example, for the universities in Oldenburg and Karlsruhe. These two are among the leading five HEIs in terms of the total third-party funding income reported to the Federal Statistical Office, but only appear in the third ranking group (i. e. 21-30) based on the DFG's statistics (cf. Table A-8 in the appendix).

According to federal statistics, the FU Berlin was characterised by extremely high third-party funding income during the three years under consideration (with approximately €43 million it has 2.6 times as much funding as second-ranked TU Berlin). This can probably be traced back to the problem, associated with this university in particular, of differentiation with the subjects and personnel of the closely related computer science department. Similar differentiation problems are apparent for the HU Berlin and for the universities in Münster, Duisburg-Essen and Freiburg.

With regard to the number of reviewers consulted by the DFG, the order of rank is similar to that of the last report: Bonn, Heidelberg and Bielefeld are at the top of the table, as they were in 2003. The special position enjoyed by the three Berlin universities in terms of DFG funding, however, is not as consistent in terms of DFG reviewers.

"Who's top in mathematics?" This question can best be answered with the data for AvH-funded research stays by international scientists; the DAAD figures cannot be reliably interpreted due to the relatively low number of mathematicians funded. On the whole, there is fairly broad agreement with the figures for DFG funding. The TU and the HU Berlin, and the universities in Bonn, Munich (TU) and Bielefeld are all in the top group of both rankings, while the popular AvH universities in Stuttgart, Tübingen and Erlangen-Nuremberg are well placed in the DFG's ranking. There are deviations from the DFG ranking, for example, in the case of the highly placed universities of Münster and Aachen, which are relatively seldom visited by AvH-funded researchers.[25]

The network analysis presented in Figure 4-3 shows all institutions that

[24] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[25] The AvH ranking of non-university research institutions frequently visited by international researchers is headed by the Weierstrass Institute for Applied Analysis and Stochastics in Berlin (cf. AvH 2006: p. 12).

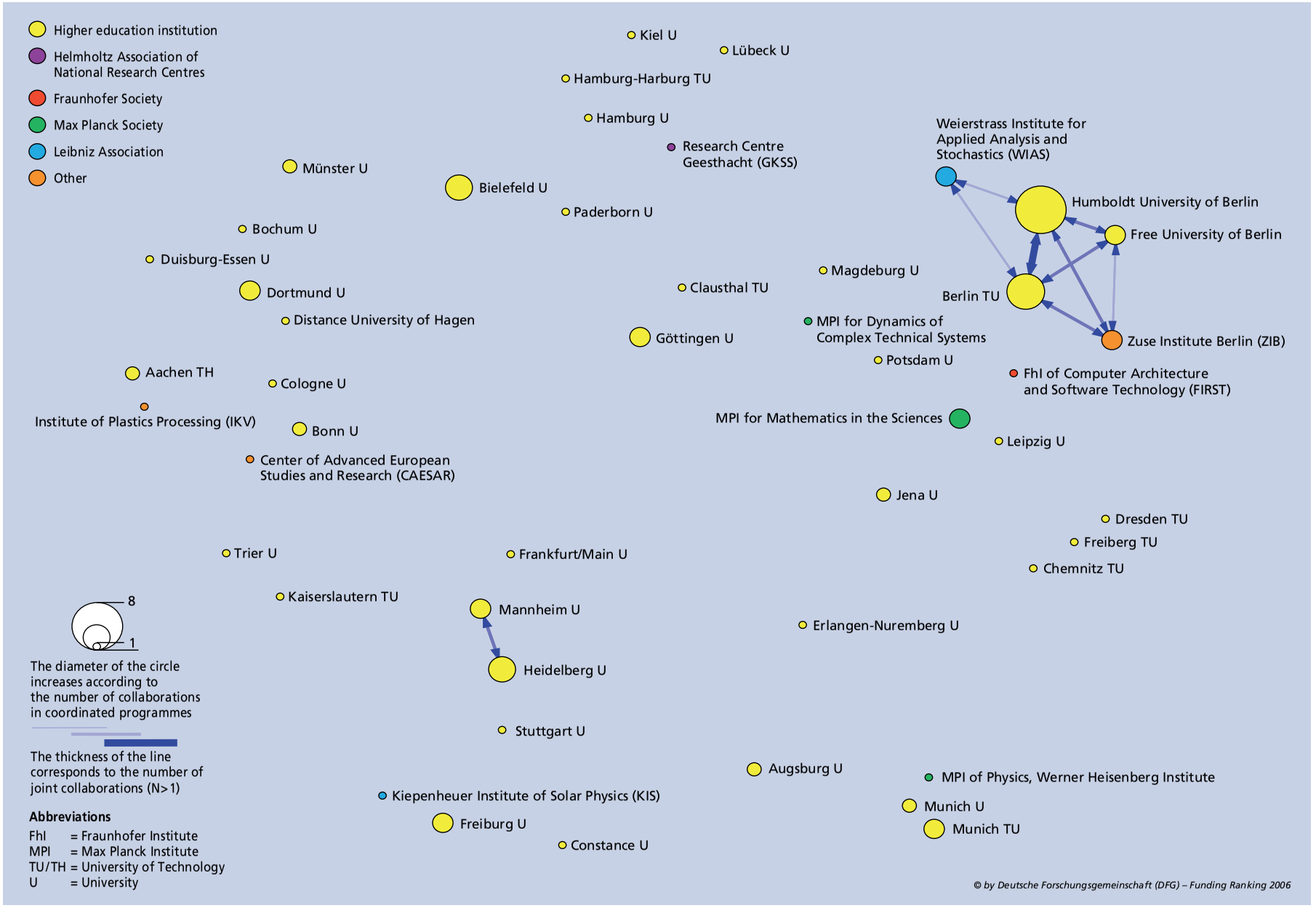


Figure 4-3:
Research institutions participating in DFG coordinated programmes and resulting collaborative relations in mathematics

participated in DFG-funded coordinated projects with mathematics as their central focus between 2002 and 2004. A total of 30 DFG-funded Research Training Groups, 7 Research Units, 6 Collaborative Research Centres and 1 Research Centre with an emphasis on mathematics are documented for the three-year study period. The HEIs mentioned above had high rates of participation in these programmes. Above-average participation, indicated in the graph by a larger symbol diameter, is documented for the TU and HU Berlin, Bielefeld, Göttingen and Heidelberg. Several joint participations in mathematics-oriented DFG programmes are shown for Mannheim and Heidelberg, and the institutions around Berlin have formed a particularly dense network of cooperation.

Centred around the HU Berlin, this network also integrates mathematicians (and scientists from other disciplines) working at the FU and TU Berlin, the Konrad Zuse Institute for Information Technology and the Weierstrass Institute for Applied Analysis and Stochastics, i. e. those HEIs that run the above-mentioned "Matheon" research centre, established in 2002. At the same time, this centre is not the sole support of these cooperative relationships. DFG-funded cooperation existed even before the centre was established; for example, in Research Unit 413 "Algorithms, Structures, Randomness" (since 2001), in Collaborative Research Centre 288 "Differential Geometry and Quantum Physics" (1992 to 2003), or in Research Training Group 588 "Combinatorics, Geometry and Computation", which also integrated scientists from outside Berlin, such as the ETH Zürich and other European institutions. The subject matter studied by this last group follows that of the Research Training Group "Algorithmic Discrete Mathematics" (1995 to 2000), which was also jointly run by the three Berlin universities together with the Konrad Zuse Institute.

4.3.4 Geosciences

The composition of the research area "geosciences" changed with the restructuring of review committees to review boards. Geography has been added, a subject traditionally located on the border between the social sciences and the natural sciences. This is shown by the list of subjects which the relevant review board is responsible for. It ranges from settlement geography and social and economic geography, to geomorphology, land geography and biogeography, to climate and hydrogeography. The importance of interdisciplinary research applies to the geosciences more than to any other research area. In addition to the links to economics and the social sciences, there are also areas of overlap with physics, chemistry and biology.

The fact that "soft" borders exist between the subjects is especially important for the interpretation of the indictors presented below. In a research area like this, with the most varied points of contact to neighbouring disciplines, it is only possible to a limited extent to assign the performances that can be read from these indicators to a narrowly defined circle of faculties or institutions that focus on the relevant subject. An institution's success in the geosciences is generally the work of many people, and the corresponding research work is divided among several faculties and institutions.

From 2002 to 2004, the DFG awarded almost €219 million to research that was primarily focused on the geosciences. The funds were allocated to 70 HEIs (€170 million) and 56 non-university research institutions (€47 million) (cf. Table A-8 and A-14 in the appendix).[26] The participation of non-university research institutions is thus higher than average. The Leibniz Institute of Marine Sciences (IFM-GEOMAR)[27], with a total of almost €18 million, is by far the highest funded of these, followed by the National Research Centre for Geosciences (GFZ) in Potsdam, with almost €7 million. Large sums also went to the Alfred Wegener Institute for Polar and Marine Research (AWI) based in Bremerhaven and to the Leibniz Institute for Tropospheric Research (IfT) in Leipzig.

Table 4-9 shows the figures relating to this research area in the usual form. The 10 largest recipients of DFG funding account for more than one-half of the total

[26] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[27] This institution originated in January 2004 from the merger of the Research Centre for Marine Geosciences (GEOMAR) and the Institute for Marine Science (IfM).

Table 4-9:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in geosciences

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Bremen U	27.7	16.3	30.2	10.1	16.2	3.4	4	2.3	1	0.6	4	7.8	12
Karlsruhe TH	9.7	22.0	15.4	15.2	18.3	7.2	8	7.0	2	1.9	4	15.7	4
Hamburg U	9.2	27.4	9.8	18.5	18.8	11.2	5	9.9	5	5.1	2	19.6	9
Kiel U	7.0	31.5	10.3	22.0	15.7	14.5	9	15.2	7	9.6	6	31.4	11
Bonn U	6.4	35.2	15.5	27.2	27.6	20.2	3	17.0	5	12.7	2	35.3	7
Berlin FU	5.6	38.6	10.3	30.6	16.0	23.6	7	21.1	11	19.7	3	41.2	10
Cologne U	5.4	41.8	13.5	35.1	16.1	27.0	4	23.4	4	22.3	2	45.1	2
Tübingen U	5.1	44.8	16.1	40.5	17.4	30.6	9	28.7	9	28.0	2	49.0	7
Münster U	5.1	47.8	15.2	45.6	11.7	33.1	9	33.9	1	28.7	1	51.0	3
Dresden TU	4.9	50.7	0.8	45.9	6.0	34.3	2	35.1	2	29.9	2	54.9	8
Bochum U	4.9	53.6	8.0	48.6	12.8	37.0	11	41.5	3	31.8	2	58.8	6
Aachen TH	4.9	56.5	8.3	51.3	10.6	39.2	2	42.7	4	34.4	1	60.8	0
Heidelberg U	4.6	59.2	5.3	53.1	14.0	42.2	9	48.0	6	38.2	1	62.7	0
Potsdam U	4.4	61.8	4.5	54.6	7.2	43.7	7	52.0	6	42.0	0	62.7	0
Munich U	4.4	64.3	17.3	60.4	18.0	47.5	8	56.7	8	47.1	1	64.7	6
Oldenburg U	4.4	66.9	2.6	61.3	2.8	48.0	0	56.7	n/a		1	66.7	2
Mainz U	4.0	69.3	7.8	63.9	13.9	51.0	3	58.5	3	49.0	2	70.6	7
Hannover U	3.8	71.5	2.2	64.6	11.6	53.4	6	62.0	3	51.0	0	70.6	0
Göttingen U	3.8	73.7	5.7	66.6	15.3	56.6	7	66.1	7	55.4	0	70.6	0
Frankfurt/Main U	3.5	75.8	5.7	68.5	14.1	59.5	2	67.3	3	57.3	0	70.6	0
Top 20 in total	**128.8**	**75.8**	**204.5**	**68.5**	**284.0**	**59.5**	**115**	**67.3**	**90**	**57.3**	**36**	**70.6**	**–**
Other HEIs	**41.1**	**24.2**	**94.2**	**31.5**	**192.9**	**40.5**	**56**	**32.7**	**67**	**42.7**	**15**	**29.4**	**–**
HEIs in total	**170.0**	**100.0**	**298.7**	**100.0**	**476.9**	**100.0**	**171**	**100.0**	**157**	**100.0**	**51**	**100.0**	**–**
Based on: N HEIs	**70**		**64**		**64**		**35**		**38**		**28**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other	Not available (n/a)

Abbreviations:

FU = Free University; HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Hamburg, Kiel, Hannover and Göttingen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

funding awarded to HEIs, and the 20 institutions listed in the table received more than three-quarters of all DFG funding in this area. With DFG funding amounting to €28 million in three years, the University of Bremen stands out as the leading research institution in the geosciences. It has already been mentioned in section 3.4 that the subject profile of Bremen is dominated by this orientation — more than 40% of all DFG funding awarded to Bremen goes to research in this area.

This funding volume is thus almost three times as high as that of either of the next two universities in the list, and is also three times as high as the amount of funding that Bremen recorded in the last ranking (third place) for 1999 to 2001 (cf. Table A-8 in the appendix for all HEIs covered in this study).

There is a simple explanation for this: the DFG-funded Research Centre Ocean Margins (RCOM), run jointly by the north-German university, the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, the MPI for Marine Microbiology in Bremen, the Wilhelmshaven branch of the Senckenberg Institute in Frankfurt, and the Center for Tropical Marine Ecology (ZMT) in Bremen. For this research centre alone, €17.9 million was allocated in three years, and, in accordance with a report on the expenditure of the funds, almost 95% of this went to the University of Bremen, with the rest going to the other participating non-university research institutes.[28]

Two other north-German coastal universities, Hamburg[29] (third place) and Kiel (fourth place), are also well positioned in the DFG ranking; the top five HEIs in this research area also include Karlsruhe (second place) and Bonn (fifth place).

The figures given by the Federal Statistical Office for the total third-party funding income of HEIs in this research area are fairly consistent with those for DFG awards. Seven of the ten HEIs with the highest DFG funding are also among the top ten in terms of total third-party funding. However, in the federal statistics, the TU Dresden deviates from this: even considering the fact that the figures for DFG funding (where awards are granted for several years) and for total third-party funding income refer to different time periods, there is a rare disparity between these amounts. It must be assumed that the funding allocated to this university for research in the geosciences was accounted for as part of other research areas in the report to the Federal Statistical Office.

The reviewers consulted by the DFG in the written review process mostly come from the same HEIs that can be described as especially active in terms of the volume of DFG funding they have received. Furthermore, the expertise of scientists and academics from Munich (U) and from the HU Berlin, which only appeared in the third ranking group of DFG in terms of DFG awards, was also called upon with more than average frequency (cf. Table A-8 in the appendix).

With regard to the number of international scientists and academics whose research stays at German universities or non-university institutions were funded by the AvH or the DAAD, the geosciences are positioned roughly in the middle compared to other research areas. The funding recipients of both organisations seem to be unanimously agreed as to the leading institutions: seven of the ten most popular destinations for AvH-funded visiting researchers are also frequently attended by DAAD-funded geoscientists. However, in both cases, the leading DFG institution, the University of Bremen, has a comparably low number of visitors. On the whole, DFG funding volumes are more closely related to the number of AvH-funded stays by international researchers than by the number of DAAD-funded researchers.

In terms of the indicators derived from the DFG's coordinated programmes, the following observations could be made. A

[28] Funding awards to DFG Research Centres entered into the DFG's proposal database include only general information, with limited differentiation by subject or institutional recipient. The reports on the expenditure of funds that are regularly requested from these centres have therefore been recorded and evaluated for this report. All of the funding allocated to the Bremen research centre has been assigned to the geosciences research area.

[29] It should be noted for the University of Hamburg that DFG funding for the research vessel METEOR is not included in the calculation. The control station located there is responsible for the scientific-technical, logistic and financial preparation, operation and supervision of the ship. From 2002 to 2004, the DFG provided €27.8 million for this ship, which is used by scientists from many HEIs and non-university research institutions as part of the programme for the funding of central research facilities.

total of 32 Research Units, Research Training Groups and Collaborative Research Centres, and one DFG Research Centre, can be assigned to the geosciences during the period from 2002 to 2004. They were particularly popular at the University of Kiel (six participations), which has entered into a permanent partnership with the Leibniz Institute of Marine Sciences, an "An-Institute" of the university (i. e. an independent research institute or establishment associated with a university), and the universities in Karlsruhe and Bremen. The German Aerospace Centre (DLR) in Cologne, which belongs to the Helmholtz Association, also has a sound place in DFG-funded research in the geosciences.

The network indicators based on participations in DFG-funded coordinated programmes, shown in Table 4-9, reveal that the research area is highly concentrated. Among the HEIs considered here, it is above all universities in Bremen, Kiel, Hamburg and Berlin (FU) that form important "nodes" that are networked with a large number of institutions.

An overview of the HEIs and non-university institutions participating in DFG coordinated programmes that focus on the geosciences can be found on the internet site of the 2006 Funding Ranking (cf. www.dfg.de/ranking/ranking2006/netzwerke).

4.4 Comparison of Indicators for the Engineering Sciences

The restructuring of review committees into review boards (cf. section 2.2) has had important consequences for the engineering sciences. The composition of these review boards, which were established in 2003, was developed, as in other subjects, in close consultation with representatives of the particular research areas. It takes into account the various shifts of emphasis undergone by technical research in recent years. For many years the only differentiation considered was between "warm" mechanical engineering (mainly thermodynamics, energy and process engineering) and "cold" mechanical engineering (mechanics and industrial and manufacturing engineering); however, in the early 1990s the "indivisible" review committee known as "mechanical engineering" was divided into the new "mechanical and industrial engineering" and "mechanical and process engineering" committees. The goals that led to the restructuring of the review boards were:

- Networking of the applied areas (such as manufacturing engineering or process engineering) with the basic research subjects important for them (such as engineering mechanics or fluid mechanics)
- Interdisciplinarity
- Allowing for new research directions that are expected to be of increasing importance
- Avoidance of division into excessively small sections

The results of this restructuring, which naturally could not be implemented without certain compromises, were as follows: the subjects of the former "mechanical and industrial engineering" review committee were divided among three review boards, 401 "production technology", 402 "mechanics and constructive mechanical engineering" and 407 "system engineering". The subjects formerly classified under review committees for "mechanical and process engineering" formed the basis of review boards 403 "process engineering and technical chemistry" and 404 "heat energy technology and thermal machines and drives". The materials science subjects that were allocated to the former review committees known as "general engineering sciences" and "mining and metallurgy" have been allocated to the review boards 405 "materials engineering" and 406 "materials science and raw materials".

On the whole, the DFG has created a subject classification system for the engineering sciences that reflects the current shape of the research landscape in the composition of the new review boards, and it has met with general acceptance. The subject classification system for mechanical engineering, with its six review boards and three research areas at the next highest level, now has a significantly more differentiated structure than was previously the case (cf. Table 2-1 and Table A2-1 in the appendix).

Since the implementation of review boards, the DFG subject classification system for the engineering sciences includes five research areas in all, the design of which is significantly different from the earlier review committee-based areas:

- Mechanical and industrial engineering
- Thermal and process engineering
- Material science and engineering
- Computer science, electrical and system engineering
- Construction engineering and architecture

The reorganisation enables better differentiation in the ranking, although individual problems must also be dealt with. For example, the subject classification system used by some of the sources drawn on for this study could not be transferred into the new DFG system, such as that of the Federal Statistical Office, which presents the thematic distribution of third-party funding income only in a comparatively aggregate form, particularly the engineering sciences. In relevant comparisons, these cases are dealt with by combining the three new subject areas mentioned above in a single category "mechanical engineering, process engineering and materials science".

Further difficulties are associated with a particular strength of the new classification system. A research area such as "thermal and process engineering" is located deliberately on the border to natural science subjects (like chemistry). Accordingly, it must be frequently assumed that DFG-funded research in this area is carried out in quite different constellations from one HEI to the next, or that it is supervised by professors from very different faculties. The statement made above in relation to the geosciences and other areas applies here too: the strong position of an institution with regard to research in an area such as "thermal and process engineering" is often gained by inter-institutional and inter-departmental efforts.

4.4.1 Mechanical and Industrial Engineering

The DFG granted €223 million in funding for the research area "mechanical and industrial engineering" between 2002 and 2004. These funds were divided between 50 HEIs (€204 million) and 36 non-university research institutions (€19 million).[30] Among the non-university research institutions who received substantial sums were the Bremen Institute for Applied Beam Technology (BIAS), the MPI for Iron Research in Düsseldorf, the Laser Centre Hannover (LZH), the Institute for Integrated Production (IPH) in Hannover and the Fraunhofer Institute for Production Technology (IPT) in Aachen. The close connections between industrial engineering research and other research areas are also shown in part by the DFG involvements of these institutions. BIAS, for example, also participates in projects with a focus on electrical engineering, computer science, system engineering and materials science. This also applies to a large extent to the MPI for Iron Research. Scientists at the LZH are also involved in DFG-funded projects in thermal and process engineering, and the IPT in Aachen also received sizeable allocations in the research area of computer science, electrical and system engineering (cf. Table A-14 in the appendix).

As in all technical subjects, research in this area is concentrated in a small number of mainly technical HEIs. The 10 largest funding recipients in industrial engineering account for 75% of all DFG funding in this area, and the top 20 institutions for 96%. In industrial engineering, three universities in particular have prominent positions: the TH Aachen, the University of Stuttgart and the University of Hannover. Their funding volumes range from €23 to over €30 million in three years, which is conspicuously higher than the HEIs that follow in the list: Dortmund, Erlangen-Nuremberg and TU Berlin (between €10 and over €14 million) (cf. Table A-8 in the appendix for all HEIs covered in this study).

The HEIs with the highest DFG funding shown in Table 4-10 are quite consistent with the leading institutions in the other mechanical engineering subject areas. The highest-funded HEIs in industrial engineering also have leading positions in thermal and process engineering and in materials science. However, clear priorities can also be seen here, as already shown in chapter 3 with the help

[30] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-10:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in mechanical and industrial engineering

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Aachen TH	30.4	14.9	192.1	14.7	19.1	8.8	6	7.1	25	16.1	6	5.5	8
Stuttgart U	25.0	27.2	135.8	25.0	19.1	17.7	14	23.5	18	27.7	11	15.5	12
Hannover U	23.2	38.6	53.8	29.1	12.8	23.6	2	25.9	10	34.2	12	26.4	15
Dortmund U	14.4	45.6	39.4	32.2	6.9	26.8	1	27.1	2	35.5	7	32.7	11
Erlangen-Nuremberg U	11.4	51.2	59.4	36.7	6.2	29.7	3	30.6	4	38.1	5	37.3	13
Berlin TU	10.8	56.5	70.5	42.1	10.2	34.4	5	36.5	7	42.6	6	42.7	8
Munich TU	9.8	61.3	57.8	46.5	9.5	38.8	2	38.8	9	48.4	10	51.8	12
Darmstadt TU	9.5	66.0	48.3	50.2	12.5	44.6	15	56.5	7	52.9	5	56.4	7
Karlsruhe TH	9.3	70.6	53.1	54.2	6.0	47.4	3	60.0	14	61.9	5	60.9	3
Dresden TU	8.5	74.7	83.6	60.6	12.1	52.9	4	64.7	14	71.0	4	64.5	3
Brunswick TU	8.2	78.8	40.2	63.7	9.1	57.2	1	65.9	3	72.9	6	70.0	12
Chemnitz TU	7.3	82.3	23.0	65.4	7.9	60.8	2	68.2	n/a		6	75.5	2
Bochum U	6.2	85.4	20.1	67.0	6.5	63.8	5	74.1	2	74.2	2	77.3	4
Bremen U	4.9	87.8	40.5	70.1	1.8	64.7	3	77.6	1	74.8	2	79.1	3
Paderborn U	4.1	89.8	23.9	71.9	3.2	66.2	3	81.2	n/a		2	80.9	5
Kaiserslautern TU	3.2	91.4	18.6	73.3	4.3	68.2	3	84.7	n/a		1	81.8	1
Clausthal TU	2.8	92.8	30.1	75.6	3.6	69.9	0	84.7	n/a		1	82.7	2
Magdeburg U	2.3	93.9	23.4	77.4	8.6	73.8	2	87.1	8	80.0	2	84.5	1
Saarbrücken U	2.1	94.9	10.4	78.2	4.1	75.7	0	87.1	1	80.6	1	85.5	1
Kassel U	1.5	95.6	11.0	79.0	5.1	78.1	0	87.1	5	83.9	1	86.4	0
Top 20 in total	**194.9**	**95.6**	**1,034.8**	**79.0**	**168.6**	**78.1**	**74**	**87.1**	**130**	**83.9**	**95**	**86.4**	**–**
Other HEIs	**8.9**	**4.4**	**274.7**	**21.0**	**47.3**	**21.9**	**11**	**12.9**	**25**	**16.1**	**15**	**13.6**	**–**
HEIs in total	**203.8**	**100.0**	**1,309.5**	**100.0**	**215.9**	**100.0**	**85**	**100.0**	**155**	**100.0**	**110**	**100.0**	**–**
Based on: N HEIs	**50**		**119**		**54**		**26**		**24**		**34**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering subjects does not allow sufficient subject differentiation. The subjects have therefore been combined into one subject area, "mechanical and process engineering and materials science" and are shown here in this aggregate form. Furthermore, DFG awards span several years, while the figures for "total income from third-party funding" submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Hannover did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

of the profile analyses. The HEIs in Stuttgart, Hannover and Dortmund, and in the smaller locations of Chemnitz and Paderborn, concentrate primarily on industrial engineering, the largest of the mechanical engineering subjects correlated here. High proportions in industrial engineering and in thermal and process engineering are characteristic for the TU Munich and the TU Brunswick, while in Erlangen-Nuremberg, the relative importance of industrial engineering (over 50% of all awards in mechanical engineering subjects) is accompanied by a roughly equal emphasis on the DFG research areas of thermal and process engineering and material science and engineering (almost 25% each). In all three of these areas, the TH Aachen stands out with a clear lead at the top of the table.

Unfortunately, on the basis of the figures submitted to the Federal Statistical Office, it is not possible to compare DFG funding in the three mechanical engineering research areas with equally differentiated statistics for third-party funding income. The figures shown in the comparison table for total third-party funding income therefore give the third-party funding income for all mechanical engineering subjects (i.e. including the DFG research areas of thermal and process engineering and materials science and industrial engineering). Nine out of the ten highest-placed DFG funding recipients in the research area of mechanical and industrial engineering also appear in the highest ranking group for total income in mechanical engineering. This ranking list is also led by the HEIs in Aachen and Stuttgart, which have received funding volumes (€192 million and €136 million, respectively) during the three-year study period (2001 to 2003) that are significantly higher than the amounts received by the HEIs that follow in the list. The TU Dresden was ranked third, with a total of €84 million, and the TU Berlin was awarded €70 million.

The distribution of funds to the individual funding areas of the federal government (e.g. energy research), of the EU (e.g. "nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices") and of the AiF, all of which are examined more closely in the next section, give more information on the particular strengths of individual HEIs in this area.

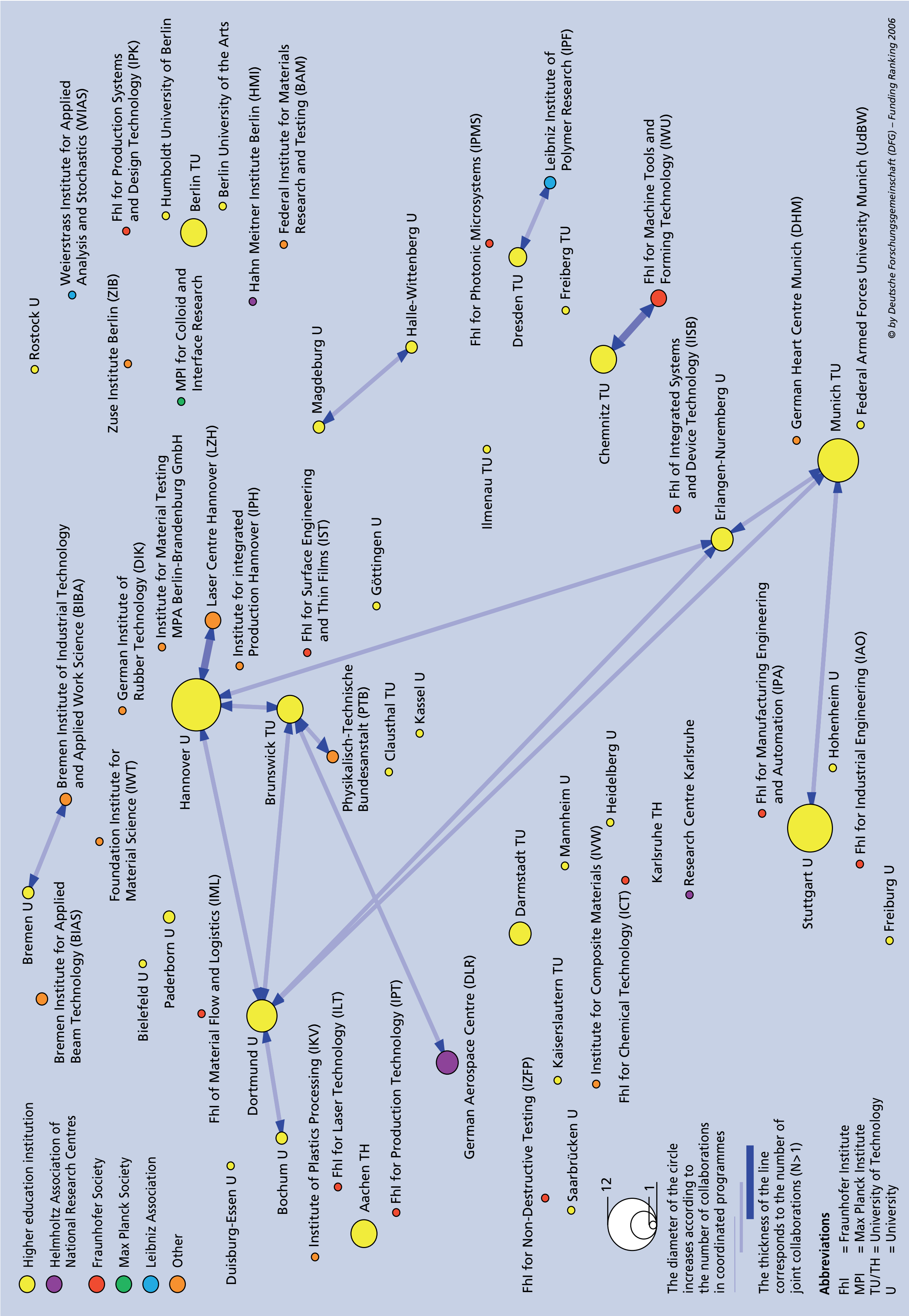
With regard to the number of scientists who, between 2002 and 2004, acted as reviewers for industrial engineering-related funding proposals for the DFG, the HEIs in Aachen, Stuttgart and Hannover are once more at the top of the list (between 13 and 19 reviewers in three years). More than 10 reviewers are documented for the HEIs in Berlin (TU), Dresden and Darmstadt.

The research stays of AvH- and DAAD-funded visiting researchers are concentrated mainly on a comparatively small group of leading industrial engineering institutions. The most popular HEIs for these AvH and DAAD funding recipients are those in Stuttgart, Darmstadt and Aachen. AvH visiting researchers are frequent guests of the TU Darmstadt (ranked first), and the University of Bochum and the TU Berlin (both in fourth place). DAAD-funded industrial engineers frequently select the TU Dresden, the TH Karlsruhe and the University of Hannover. In both cases the ranking groups are in accord with the figures for DFG funding awards.

In the context of DFG cooperative research programmes with a focus on industrial engineering, a total of 79 Research Units, Research Training Groups and Collaborative Research Centres (including Transfer Units) were funded between 2002 and 2004. The two last-named programmes are of particular importance in these areas (cf. Table 2-9 in chapter 2). HEIs in Hannover, Stuttgart and Munich (TU) were especially active in these programmes. This cooperation resulted in relationships between institutions that participate together in one or more programmes. Going by the number of HEIs and non-university research institutions with which they are associated in coordinated research programmes with an emphasis on industrial engineering, the HEIs in Stuttgart, Hannover, Erlangen-Nuremburg, Munich (TU) and Brunswick are particularly active in research collaborations. These HEIs also belong to the top group in terms of DFG funding volumes.

The basis of this position is illustrated by Figure 4-4. Designed to reflect the geographical locations, it presents the institutions that participated in DFG-fund-

Figure 4-4:
Research institutions participating in DFG coordinated programmes and resulting collaborative relations in mechanical and industrial engineering



ed coordinated programmes during the study period from 2002 to 2004. The special position of Hannover can be read here not only from the number of programmes (indicated by the diameter of the symbol), but also from the multiplicity of relationships linking the university to a dense, local and transregional network of cooperation (only links between institutions with more than two or more joint participations in DFG programmes are shown). A large number of non-university research institutes that participate in the DFG's industrial engineering programmes are located in and around Hannover, and the same applies to Brunswick, which is located close by. Hannover has a close relationship with this university, as well as to other leading industrial engineering institutions such as Dortmund, Erlangen-Nuremberg and the TU Munich.

Berlin has its own cluster, with weak links, however, that are not visible in the graph. Non-university research institutions are active participators here, and even the University of the Arts is integrated through the participation of its department of "Design and Structural Design" in Collaborative Research Centre 281: "Disassembly Factories".[31] Otherwise, regular partnerships have been established in Saxony, for example, between the TU Dresden and the Leibniz Institute for Polymer Research in Dresden; or between the TU Chemnitz and the Fraunhofer Institute for Machine Tools and Forming Technology (IWU) at the same location. Fraunhofer institutes have a relatively central role to play in DFG-funded industrial engineering as a whole, and the participation of such institutes can also be seen in Stuttgart, Karlsruhe, Aachen, Brunswick, Dortmund, Saarbrücken and Berlin. Alongside the above-mentioned locations, regional cooperation networks based on DFG-funded programmes for industrial engineering have also been established in Bremen and Aachen.

It should be noted, particularly in relation to mechanical engineering, that DFG programmes represent only a small subsection of the actual cooperation going on. Neither cooperation with commercial research organisations nor cooperation as part of the coordinated programmes of other major funding bodies (such as the EU or the German government) can be read from this graph. A more detailed consideration of such cooperation is therefore planned in a subsequent project, "Mechanical Engineering Research Atlas", which will be based on an extended data set.[32]

4.4.2 Thermal and Process Engineering

The research area of thermal and process engineering was created as part of the restructuring of the DFG review system in 2003. As described above, it includes the two review boards 403 "process engineering and technical chemistry" and 404 "heat energy technology, thermal machines and drives". The field is thus defined by mechanical engineering-related subjects, but also has close relations with other areas, particularly chemistry.

Between 2002 and 2004, a total volume of €143 million was allocated to projects in this research area. These funds were awarded to scientists at 61 HEIs (€131 million) and 42 non-university research institutions (€11 million).[33] Among the non-university research institutions, large amounts went, for example, to the institutes combined in the German Aerospace Centre, to the Society for Biotechnological Research (GBF) in Brunswick, to the Research Centre Rossendorf (FZR) in Dresden and to the Research Centre Jülich (FZJ) (cf. Table A-14 in the appendix).

As with industrial engineering, the statistics show that the area of thermal and process engineering is also concentrated in a few mainly technical HEIs, although with a less exclusive emphasis. Here, 63% of all DFG funding went to ten HEIs, whereas the figure for industrial engineering was 75%. The ranking of the most active DFG HEIs in thermal and process engineering is led by the techni-

[31] Another, at first glance "unexpected", partner for industrial engineering research is found in the south of Germany: at the University of Mannheim, the department of "Business and Organisational Psychology" participated in the since completed SFB 467 "Transformable Corporate Structures" of the University of Stuttgart.

[32] The "Recommendations for Production Engineering" from the German Science Council should also be mentioned here. This report records an "unusually high level of collaboration and networking and a strong will to cooperation" at scientific institutions involved in mechanical engineering (cf. German Science Council 2004: p. 81).

[33] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-11:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in thermal and process engineering

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Aachen TH	15.3	11.7	192.1	14.7	19.6	8.2	5	5.8	7	17.5	6	13.0	10
Karlsruhe TH	13.1	21.7	53.1	18.7	16.1	15.0	6	12.8	3	25.0	3	19.6	11
Darmstadt TU	9.4	28.9	48.3	22.4	11.1	19.6	7	20.9	0	25.0	4	28.3	11
Munich TU	8.7	35.6	57.8	26.8	14.4	25.6	8	30.2	0	25.0	5	39.1	13
Stuttgart U	8.0	41.7	135.8	37.2	16.8	32.7	15	47.7	2	30.0	4	47.8	10
Berlin TU	7.7	47.5	70.5	42.6	11.5	37.5	1	48.8	3	37.5	3	54.3	9
Brunswick TU	5.8	51.9	40.2	45.6	7.3	40.5	0	48.8	0	37.5	1	56.5	2
Erlangen-Nuremberg U	5.0	55.8	59.4	50.2	9.8	44.7	10	60.5	4	47.5	1	58.7	3
Bremen U	4.9	59.6	40.5	53.3	2.9	45.9	1	61.6	1	50.0	2	63.0	3
Dortmund U	4.9	63.3	39.4	56.3	9.6	49.9	1	62.8	3	57.5	1	65.2	1
Duisburg-Essen U	4.1	66.4	18.8	57.7	12.2	55.0	2	65.1	0	57.5	2	69.6	0
Dresden TU	4.1	69.6	83.6	64.1	7.3	58.1	2	67.4	1	60.0	2	73.9	13
Freiberg TU	3.8	72.5	40.2	67.2	6.6	60.8	0	67.4	n/a		2	78.3	4
Magdeburg U	3.3	75.0	23.4	68.9	8.9	64.6	0	67.4	2	65.0	3	84.8	12
Hannover U	3.3	77.5	53.8	73.1	4.9	66.6	2	69.8	5	77.5	0	84.8	0
Ilmenau TU	2.8	79.6	13.7	74.1	0.6	66.9	2	72.1	0	77.5	1	87.0	0
Hamburg-Harburg TU	2.7	81.7	22.9	75.8	7.3	69.9	6	79.1	0	77.5	0	87.0	0
Bochum U	2.6	83.7	20.1	77.4	9.9	74.0	2	81.4	1	80.0	1	89.1	1
Kaiserslautern TU	2.1	85.3	18.6	78.8	4.4	75.9	2	83.7	n/a		0	89.1	0
Halle-Wittenberg U	1.9	86.7	8.2	79.4	4.1	77.6	1	84.9	2	85.0	0	89.1	0
Top 20 in total	**113.4**	**86.7**	**1,040.1**	**79.4**	**185.2**	**77.6**	**73**	**84.9**	**34**	**85.0**	**41**	**89.1**	**–**
Other HEIs	**17.4**	**13.3**	**269.4**	**20.6**	**53.5**	**22.4**	**13**	**15.1**	**6**	**15.0**	**5**	**10.9**	**–**
HEIs in total	**130.8**	**100.0**	**1,309.5**	**100.0**	**238.7**	**100.0**	**86**	**100.0**	**40**	**100.0**	**46**	**100.0**	**–**
Based on: N HEIs	**61**		**119**		**57**		**28**		**18**		**21**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other	Not available (n/a)

Abbreviations:

HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering subjects does not allow sufficient subject differentiation. The subjects have therefore been combined into one subject area, "mechanical and process engineering and materials science" and are shown here in this aggregate form. Furthermore, DFG awards span several years, while the figures for "total income from third-party funding" submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The universities of Hannover and Halle-Wittenberg did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

cal universities in Aachen and Karlsruhe, followed by Darmstadt, Munich (TU) and Stuttgart; all HEIs that are ranked highly in industrial engineering and, with the exception of Darmstadt, also in chemistry (cf. Table A-8 in the appendix for all HEIs covered in this study). As already seen for industrial engineering, the figures returned to the Federal Statistical Office for total third-party funding income[34] are consistent with the DFG ranking. Eight of the ten highest placed institutions in this research area also have leading positions with regard to their total third-party funding income for mechanical engineering.[35]

Scientists asked by the DFG to evaluate proposals in this field as part of the written review process, frequently came from the technical universities in Aachen, Stuttgart, Karlsruhe, Munich and Duisburg-Essen. There is also a close correlation between these experts and the third-party funding income figures described above.

On the whole, the number of international visiting researchers funded by the AvH or the DAAD in this research area is quite low. The AvH ranking is headed by the HEIs in Stuttgart (15 visiting researchers) and Erlangen-Nuremberg (10), followed by Munich (TU) (8), Darmstadt (7), Karlsruhe (6) and Hamburg-Harburg (6). The only HEIs with a fair number of DAAD-funded international researchers are in Aachen (7), Hannover (5) and Erlangen-Nuremberg (4). The other values are statistically unreliable.

An examination of the indicators for DFG cooperative research programmes shows that the total number of coordinated programmes that can be assigned to this area in its narrow definition is also relatively low. It is above all Collaborative Research Centres (13) and Research Units (8) which are funded in this area. With only two cases in all, Research Training Groups are used only to a small extent in this subject area. A larger number of participations in cooperative programmes have been recorded for only a small number of HEIs. The list is led by Aachen (6 participations), followed by Munich (TU), Darmstadt and Stuttgart, with four to five participations each (cf. Table 4-11). Apart from the five HEIs with the highest funding, the TU Dresden and the University of Magdeburg are also in networks with a large number of institutions within DFG cooperative research programmes.

The graph illustrating cooperation networks between research institutions active in this research area (cf. www.dfg.de/ranking/ranking2006/netwerke) shows a relatively consolidated network of relationships between the "larger" research locations. Joint project participations are shown between Aachen and Berlin, Munich (TU) and Stuttgart, Karlsruhe and Darmstadt, and with particular intensity between Darmstadt and the TU Munich. The area around Dresden is characterised by broad participation in coordinated programmes on the part of non-university research institutions, including the Research Centre Rossendorf, the MPI for the Physics of Complex Systems, and the Leibniz Institute for Solid State and Materials Research, which is also very active in physics. The same applies to the area around Bremen, in which the Institute for Materials Science Engineering, the Alfred Wegener Institute for Polar and Marine Research and the Bremen Institute for Applied Beam Technology (BIAS) participate in thermal and process engineering-related DFG-funded programmes.

4.4.3 Material Science and Engineering

The research area "material science and engineering", established following the restructuring of review committees to review boards, comprises review boards 405 "materials engineering" and 406 "materials science and raw materials". During the study period from 2002 to 2004, a total funding volume of over €120 million was allocated to projects in this area. This corresponds to roughly 3% of the DFG's total funding (cf. Table 2-11). The amount was divided between 56 HEIs (€101 million) and 40 non-university research institutions (€20 million).[36] Among the main non-university funding recipients are the institutes combined in the German Aerospace Centre, the Leibniz Institute for Solid State and Materi-

[34] The data from the Federal Statistical Office can not be differentiated into the three DFG mechanical engineering subject areas. It therefore covers the whole range of mechanical engineering subjects.

[35] See section 4.5 for data relating to the programmes of the EU and the German Government in the areas of energy research and aerospace engineering.

[36] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

Table 4-12:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in material science and engineering

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Aachen TH	22.2	22.1	192.1	14.7	13.4	6.3	18	20.9	8	36.4	7	23.3	14
Darmstadt TU	7.4	29.4	48.3	18.4	8.9	10.5	9	31.4	0	36.4	1	26.7	1
Clausthal TU	5.9	35.3	30.1	20.7	15.4	17.7	5	37.2	n/a		3	36.7	9
Karlsruhe TH	5.5	40.7	53.1	24.7	8.9	21.9	4	41.9	0	36.4	2	43.3	2
Dresden TU	5.4	46.1	83.6	31.1	11.0	27.1	3	45.3	1	40.9	1	46.7	0
Bochum U	5.4	51.5	20.1	32.6	5.8	29.8	6	52.3	0	40.9	2	53.3	7
Erlangen-Nuremberg U	5.2	56.7	59.4	37.2	16.4	37.5	2	54.7	2	50.0	1	56.7	5
Stuttgart U	4.4	61.0	135.8	47.5	3.8	39.3	3	58.1	0	50.0	3	66.7	4
Freiberg TU	4.3	65.3	40.2	50.6	17.8	47.7	2	60.5	n/a		0	66.7	0
Hannover U	4.1	69.4	53.8	54.7	2.1	48.7	2	62.8	0	50.0	2	73.3	5
Bremen U	4.1	73.4	40.5	57.8	2.3	49.8	0	62.8	0	50.0	0	73.3	0
Hamburg-Harburg TU	3.0	76.4	22.9	59.5	5.4	52.3	4	67.4	0	50.0	1	76.7	1
Siegen U	2.1	78.4	6.7	60.1	5.1	54.7	0	67.4	n/a		0	76.7	0
Brunswick TU	1.8	80.3	40.2	63.1	8.1	58.5	2	69.8	1	54.5	1	80.0	2
Chemnitz TU	1.8	82.1	23.0	64.9	2.9	59.9	0	69.8	n/a		0	80.0	0
Berlin TU	1.8	83.9	70.5	70.3	6.1	62.7	3	73.3	7	86.4	0	80.0	0
Saarbrücken U	1.6	85.5	10.4	71.1	7.0	66.0	1	74.4	0	86.4	0	80.0	0
Kassel U	1.3	86.8	11.0	71.9	1.9	66.9	1	75.6	0	86.4	0	80.0	0
Kaiserslautern TU	0.9	87.6	18.6	73.3	2.4	68.0	0	75.6	n/a		1	83.3	1
Ilmenau TU	0.9	88.5	13.7	74.4	3.8	69.8	1	76.7	1	90.9	0	83.3	0
Top 20 in total	**89.2**	**88.5**	**973.8**	**74.4**	**148.5**	**69.8**	**66**	**76.7**	**20**	**90.9**	**25**	**83.3**	**–**
Other HEIs	**11.6**	**11.5**	**335.7**	**25.6**	**64.2**	**30.2**	**20**	**23.3**	**2**	**9.1**	**5**	**16.7**	**–**
HEIs in total	**100.8**	**100.0**	**1,309.5**	**100.0**	**212.7**	**100.0**	**86**	**100.0**	**22**	**100.0**	**30**	**100.0**	**–**
Based on: N HEIs	**56**		**119**		**54**		**26**		**8**		**16**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other	Not available (n/a)

Abbreviations:

HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering subjects does not allow sufficient subject differentiation. The subjects have therefore been combined into one subject area, "mechanical and process engineering and materials science" and are shown here in this aggregate form. Furthermore, DFG awards span several years, while the figures for "total income from third-party funding" submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Hannover did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

als Research in Dresden, the Research Centre Jülich (FZJ), the MPI for Iron Research in Düsseldorf, the Federal Institute for Materials Research and Testing (BAM) based in Berlin, and the Research Centre Karlsruhe (FZK) (cf. Table A-14 in the appendix).

In materials engineering, the ten leading DFG funding recipients account for 70% of all DFG funding in this area. With a total funding volume of €22 million, the TH Aachen is ranked first, with a clear lead over the rest of the field. Aachen thus occupies the first place in all three mechanical engineering subject areas. In the area of material science and engineering, the Collaborative Research Centres located at the RWTH Aachen (e.g. SFB 2889 "Forming of Metals in the Semi-Solid State and their Properties" or SFB 370 "Integral Materials Modelling") make a significant contribution to this central role in materials engineering. Aachen is followed in the ranking by Darmstadt (€7 million), Clausthal (€6 million), Karlsruhe, Dresden and Bochum (with €5.5 million each) (cf. Table A-8 in the appendix for all HEIs covered in this study).

It is noticeable that materials engineering, in comparison to the other two mechanical engineering subjects, is a clear priority for Clausthal — accounting for almost 60% of all the DFG funding it received for these three research areas. Comparable priorities — with shares of between 40% and 50% for mechanical engineering awards as a whole — are recorded for the HEIs in Freiberg, Hamburg-Harburg and Kassel. In Darmstadt, the three mechanical engineering research areas account for roughly equal shares of the funding, whereas Karlsruhe, in terms of DFG funding, is more focused on industrial engineering, and thermal and process engineering. With regard to the TH Karlsruhe, mention must also be made of the DFG Research Centre "Functional Nanostructures", which, as outlined in section 4.3.2, has been assigned in the DFG statistics to the research areas of chemistry and physics. However, it also has clear connections with the research areas under consideration here, for example, in the form of the materials science research field "Nanostructured Materials", which is an essential component of the research centre.

As in the two subsections of mechanical engineering already discussed, the DFG ranking for materials engineering is also quite consistent with the ranking of HEIs according to the figures relating to third-party funding income in the area of mechanical engineering reported to the Federal Statistical Office.[37] Seven of the ten leading DFG funding recipients are also to be found in the first ranking group of the federal statistics.

The table also shows that Clausthal and Aachen are well represented among the reviewers consulted by the DFG in the written review process. The TU Freiberg and the University of Erlangen-Nuremberg are at the top of this ranking, and the TU Dresden is also one of the top five HEIs.

Aachen's leading position in this research area is confirmed once more by visiting researchers funded by the DAAD and the AvH. In both cases, this university in Rhineland-Westphalia is ranked first in the "visiting researchers ranking", with 18 (AvH) and 8 (DAAD) funding recipients. The only other popular HEI on the list of DAAD-funded visiting researchers is the TU Berlin, with 7 visiting researchers. Research stays at other HEIs only occurred in individual cases. The list of research stays by AvH-funded researchers is somewhat more reliable, and the leading HEIs on this list are quite consistent with the institutions at the top of the DFG ranking.

As in thermal and process engineering, there is also a relatively small number of DFG coordinated programmes in this area. Six Research Units, eleven Collaborative Research Centres and one Graduate Training Group are documented for the study period. The TU Aachen participates most frequently in these programmes, followed by the HEIs in Stuttgart and Clausthal. The group of HEIs with the highest rate of participation in DFG-funded materials engineering programmes also includes the FZJ and the institutes combined in the DLR. The corresponding graph of cooperation networks, available on the Funding Ranking

[37] The data from the Federal Statistical Office cannot be differentiated according to the three DFG mechanical engineering research areas. It therefore covers the whole range of mechanical engineering subjects.

Table 4-13:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in computer science, electrical and system engineering

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Karlsruhe TH	18.6	7.9	40.4	5.6	36.7	6.5	4	3.5	6	5.1	7	9.7	10
Aachen TH	15.6	14.5	44.3	11.8	29.1	11.7	3	6.1	14	16.9	2	12.5	1
Dresden TU	12.1	19.7	41.0	17.5	21.3	15.4	2	7.8	9	24.6	6	20.8	4
Munich TU	11.8	24.6	48.6	24.2	36.6	21.9	16	21.7	5	28.8	3	25.0	7
Stuttgart U	11.7	29.6	27.6	28.0	18.2	25.2	7	27.8	5	33.1	4	30.6	1
Dortmund U	11.4	34.5	19.8	30.8	17.6	28.3	1	28.7	1	33.9	3	34.7	5
Paderborn U	11.2	39.2	24.5	34.2	15.2	31.0	0	28.7	n/a		4	40.3	0
Erlangen-Nuremberg U	9.5	43.3	21.0	37.1	23.3	35.1	6	33.9	5	38.1	5	47.2	1
Brunswick TU	9.4	47.3	22.9	40.3	17.8	38.2	1	34.8	2	39.8	0	47.2	0
Bremen U	7.5	50.4	27.5	44.1	8.8	39.8	2	36.5	5	44.1	0	47.2	0
Berlin TU	7.4	53.6	31.3	48.4	21.6	43.6	8	43.5	5	48.3	3	51.4	8
Darmstadt TU	7.2	56.6	29.2	52.5	19.5	47.1	11	53.0	5	52.5	4	56.9	4
Chemnitz TU	6.2	59.3	14.3	54.5	8.5	48.6	1	53.9	n/a		1	58.3	0
Ilmenau TU	5.7	61.7	17.9	56.9	10.6	50.5	2	55.7	11	61.9	1	59.7	0
Kaiserslautern TU	5.3	63.9	14.1	58.9	15.3	53.2	2	57.4	n/a		1	61.1	0
Saarbrücken U	4.7	65.9	9.0	60.1	10.6	55.1	4	60.9	1	62.7	1	62.5	5
Freiburg U	4.4	67.8	15.9	62.4	16.2	57.9	3	63.5	0	62.7	0	62.5	0
Ulm U	4.3	69.6	21.5	65.3	13.3	60.3	1	64.3	3	65.3	0	62.5	0
Berlin HU	4.1	71.3	4.9	66.0	6.2	61.4	2	66.1	2	66.9	2	65.3	5
Hannover U	3.9	73.0	7.5	67.1	15.7	64.2	2	67.8	6	72.0	0	65.3	0
Top 20 in total	**171.9**	**73.0**	**483.1**	**67.1**	**362.0**	**64.2**	**78**	**67.8**	**85**	**72.0**	**47**	**65.3**	**–**
Other HEIs	**63.6**	**27.0**	**237.2**	**32.9**	**202.2**	**35.8**	**37**	**32.2**	**33**	**28.0**	**25**	**34.7**	**–**
HEIs in total	**235.5**	**100.0**	**720.3**	**100.0**	**564.2**	**100.0**	**115**	**100.0**	**118**	**100.0**	**72**	**100.0**	**–**
Based on: N HEIs	**82**		**150**		**79**		**36**		**29**		**35**		

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 and other | Not available (n/a)

Abbreviations:

HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the "third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Hannover did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

internet site (cf. www.dfg.de/ranking/ranking2006/netzwerke), demonstrates that regional networks of cooperative research, based on joint participation in DFG-funded programmes, have mainly been set up in the area around Aachen and in the neighbouring Ruhr district.

4.4.4 Computer Science, Electrical and System Engineering

The research area "computer science, electrical and system engineering" differs from the previous review committee-based area by the inclusion of system engineering. With this addition, the DFG accounts for the growing importance of research in the areas of microsystems engineering, robotics, automation engineering, sensors, measurement engineering, human-machine systems and traffic and transport systems.

It should be noted here, particularly with regard to computer science, that the funding activities of the DFG and the other funding bodies apply to projects with a highly diversified thematic field. Computer science projects are carried out at institutes that focus on mathematics, engineering sciences, biology, or economic and social science. As in the other research areas described above, the figures consulted here provide well-grounded information about an institution's general performance in this area, but the data does not justify conclusions about the individual faculties of an institution.

A total of €255 million, or 7% of the total volume of funding, was awarded to the subjects in this category between 2002 and 2004. The funds were divided between 82 HEIs (€236 million) and 47 non-university research institutions (€18 million).[38] In terms of DFG funding, there is thus an below-average level of participation by scientists working outside an HEI in this research area. The main non-university research institutions in this area include the MPI for Informatics in Saarbrücken, the institutes combined in the German Aerospace Centre (DLR), the Physikalisch-Technische Bundesanstalt based in Brunswick, and the FhI for Telecommunications (Heinrich Hertz Institute, HHI) in Berlin (cf. Table A-14 in the appendix).

The ten HEIs with the highest DFG funding in this area account for more than one-half of the total volume allocated to HEIs. The field is led by the HEIs in Karlsruhe, Aachen, Dresden, Munich (TU), Stuttgart, Dortmund and Paderborn (with amounts between €10 and €19 million) (cf. Table A-8 in the appendix for all HEIs covered in this study).

A consideration of the research profiles that emerge from the DFG-funded activities of the HEIs shows that the area of computer science, electrical and system engineering is an important priority for the University of Paderborn. Almost one-half (48%) of the DFG funding received by this university was for projects in these research fields. This also applies to the TU Ilmenau, where this area accounts for 52% of DFG funding.[39]

The figures for DFG funding are quite consistent with those for third-party funding income reported to the Federal Statistical Office, as well as to the number of DFG reviewers from an HEI. However, Bremen and the TU Chemnitz are exceptions, in that they provide relatively few reviewers in this area in comparison to the amount of third-party funded research they carry out.

There is broad agreement among the international visiting researchers funded by the AvH and the DAAD with regard to the leading institutions in Germany, although some differences in priority are apparent. At the AvH, the three technical universities in Munich, Darmstadt and Berlin are the most popular; at the DAAD it is Aachen, Ilmenau and Dresden. Due to the low number of AvH- and DAAD-funded researchers visiting other HEIs, it is not possible to draw any further conclusions about the ranking.

On the whole, the indicators considered for this research area draw a very consistent picture.

In the context of the DFG-funded coordinated research programmes, there were a total of 47 programmes, including 26 Research Training Groups, 9 Research Units, 9 Collaborative Research Centres and 3 SFB Transfer Units. In comparison with the other engineering sciences research areas, programmes aiming at the structured training of young research-

[38] The remainder is accounted for by funding allocations to individuals without any institutional affiliation and to scientists and fellows working abroad.

[39] See section 4.5 for data relating to research in the area of information technology funded by the EU and the German government.

Table 4-14:
Summarised comparison of indicators for the 20 higher education institutions with the highest DFG funding volume in construction engineering and architecture

Higher education institution	Third-party funding income[1]				Scientific expertise		International appeal				DFG cooperative research programmes		
	DFG awards		Third-party funding income as per Federal Statistical Office[2]		DFG reviewers[3]		AvH visiting researchers		DAAD researchers[4]		Collaborations		Partner institutions
	Mio. €	cum. %	Mio. €	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N
Brunswick TU	7.1	13.5	24.4	7.0	13.4	5.1	1	2.8	3	3.8	2	6.5	2
Karlsruhe TH	6.3	25.6	40.0	18.6	14.0	10.4	4	13.9	3	7.7	3	16.1	7
Aachen TH	4.9	34.8	30.2	27.3	15.1	16.1	3	22.2	6	15.4	2	22.6	5
Dresden TU	4.5	43.5	16.3	32.0	13.4	21.1	3	30.6	7	24.4	3	32.3	7
Weimar U	4.4	52.0	19.3	37.5	14.4	26.6	0	30.6	n/a		2	38.7	4
Stuttgart U	3.6	58.9	44.5	50.4	19.0	33.8	4	41.7	9	35.9	5	54.8	14
Bochum U	3.5	65.5	11.1	53.6	13.6	38.9	0	41.7	7	44.9	2	61.3	4
Munich TU	3.0	71.1	26.3	61.1	21.8	47.2	3	50.0	3	48.7	1	64.5	4
Darmstadt TU	1.9	74.7	21.3	67.3	11.5	51.5	1	52.8	3	52.6	1	67.7	6
Berlin TU	1.5	77.6	7.6	69.4	14.3	56.9	3	61.1	13	69.2	0	67.7	0
Hamburg-Harburg TU	1.5	80.4	10.3	72.4	6.2	59.3	1	63.9	2	71.8	1	71.0	0
Duisburg-Essen U	1.4	83.1	5.5	74.0	6.1	61.6	1	66.7	2	74.4	1	74.2	2
Hannover U	1.3	85.5	17.3	79.0	8.5	64.8	2	72.2	8	84.6	1	77.4	2
Kassel U	1.1	87.7	9.3	81.6	9.0	68.2	1	75.0	2	87.2	1	80.6	6
Wuppertal U	0.7	89.0	5.2	83.1	5.2	70.2	0	75.0	n/a		1	83.9	2
Cottbus TU	0.7	90.3	4.2	84.4	7.2	72.9	0	75.0	n/a		0	83.9	0
Kaiserslautern TU	0.6	91.6	6.0	86.1	7.5	75.7	0	75.0	n/a		1	87.1	4
Dortmund U	0.6	92.6	7.7	88.3	8.7	79.0	0	75.0	5	93.6	1	90.3	6
Leipzig U	0.4	93.4	1.9	88.8	2.5	79.9	1	77.8	1	94.9	0	90.3	0
Bremen H	0.3	93.9	3.3	89.8	1.0	80.3	0	77.8	n/a		0	90.3	0
Top 20 in total	**49.3**	**93.9**	**311.6**	**89.8**	**212.5**	**80.3**	**28**	**77.8**	**74**	**94.9**	**28**	**90.3**	**–**
Other HEIs	**3.2**	**6.1**	**35.4**	**10.2**	**52.1**	**19.7**	**8**	**22.2**	**4**	**5.1**	**3**	**9.7**	**–**
HEIs in total	**52.5**	**100.0**	**346.9**	**100.0**	**264.5**	**100.0**	**36**	**100.0**	**78**	**100.0**	**31**	**100.0**	**–**
Based on: N HEIs	**46**		**78**		**72**		**21**		**18**		**18**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 and other	Not available (n/a)

Abbreviations:

H = University of Applied Sciences; HEI = Higher education institution; TU/TH = University of Technology; U = University

[1] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, while the „third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[2] The University of Hannover and the University of Applied Sciences Bremen did not classify a large portion (>20 percent) of their third-party funding income according to subject; it has instead been booked to a common account. Therefore, the information presented here, which is based on research areas, may lead to an underclassification.

[3] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[4] For DAAD-funded researchers, subject-related data is available on higher education institutions with total expenditures of at least one million euros per year (according to the DAAD's funding report).

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) by higher education institution and DFG research area (2002 to 2004).

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004).

Calculated by the DFG.

ers as part of the DFG Research Training Groups are in relatively high demand here. Above-average participation in coordinated programmes is documented above all for the HEIs in Karlsruhe, Dresden, and Erlangen-Nuremberg, whether in the form of university teachers involved in Research Training Groups or of project leaders in Research Units or Collaborative Research Centres.

The graph available on the 2006 Funding Ranking internet site (cf. www.dfg.de/ranking/ranking2006/netzwerke) shows the institutions that participated in the above-mentioned DFG coordinated programmes between 2002 and 2004 and illustrates the cooperative relationships formed in the context of these programmes.

4.4.5 Construction Engineering and Architecture

Between 2002 and 2004, the DFG awarded a total of €54 million to this relatively small research area (1.5% of the total funding volume). The funds were divided between 46 HEIs (€53 million) and 10 non-university research institutions (€1.5 million). The latter are shown in Table A-14 in the appendix.

In accordance with the size of this research area, only a small number of HEIs are actively engaged in research in construction engineering and architecture. The top ten HEIs account for 78% of all DFG funding in this area. In comparison with the last ranking, the group of leading HEIs has remained stable. With amounts of between €7 and €6 million, researchers at the technical universities of Brunswick and Karlsruhe lead the field, followed by Aachen, Dresden and Weimar, with amounts of between €4 and €5 million (cf. see Table A-8 in the appendix for all HEIs covered in this study). According to the third-party funding figures of the Federal Statistical Office, which are based on annual reports by the HEIs on their different subject areas, the ranking is led by the universities in Stuttgart, Karlsruhe, Aachen, Munich (TU) and Brunswick. However, the University of Weimar, which is relatively small but specialised in this area, is also ranked among the ten HEIs with the highest third-party funding income (third-party funding income is also documented for Weimar in the humanities and the social and behavioural sciences).

In relation to the number of reviewers consulted, the TU Munich is at the top of the list, and, on the whole, this ranking is also quite consistent with the ranking according to DFG awards. All in all, a relatively low number of research stays by visiting researchers have been documented for this area. A larger number of DAAD-funded visiting researchers went to the TU Berlin, followed by Stuttgart and Hannover. Together with Karlsruhe, Stuttgart is also at the top of the list for AvH-funded stays, however, too few research stays have been funded by the AvH in this area to allow a reliable interpretation of the data as a ranking.

Altogether seven Research Units, two Research Training Groups and five Collaborative Research Centres were funded by the DFG from 2002 to 2004 in the area of construction engineering and architecture. These programmes are primarily used by those institutions that are generally active in terms of third-party funded research activities — Stuttgart, Karlsruhe and Dresden.

As illustrated by the graph available on the 2006 Funding Ranking internet site (cf. www.dfg.de/ranking/ranking2006/netzwerke), cooperative partnerships have developed between Stuttgart and Karlsruhe and between Stuttgart and Saarbrücken. But on the whole, cooperation in this research area tends more often to take the form of intra-institutional cooperation.

4.5 Funding by the German Government, the EU and the AiF in Selected Fields of Research

While the previous sections concentrated on the comparison of indicators for the various research areas, the analyses presented below, based on selected funding areas of the EU and the German government, enable the presentation of further detailed information about the research profiles of the HEIs covered here. Furthermore, data from the German Federation of Industrial Research Associations (AiF) indicate at which HEIs scientists involved in knowledge transfer to small- and medium-sized firms are especially active. In addition to identifying the HEIs

Table 4-15:
The 20 higher education institutions with the highest funding amounts in the German government's „large-scale equipment for basic research" funding area

Higher education institution	Mio. €	cum. %
Munich TU	17.0	12.1
Heidelberg U	13.3	21.6
Aachen TH	10.4	29.0
Mainz U	7.2	34.2
Bonn U	7.0	39.2
Munich U	6.3	43.7
Hamburg U	6.0	48.0
Freiburg U	5.5	51.9
Bochum U	5.0	55.5
Darmstadt TU	4.8	59.0
Wuppertal U	4.8	62.4
Karlsruhe TH	4.8	65.8
Erlangen-Nuremberg U	4.2	68.8
Frankfurt/Main U	3.9	71.6
Göttingen U	3.2	73.9
Berlin HU	2.8	75.9
Giessen U	2.7	77.9
Dresden TU	2.6	79.7
Dortmund U	2.6	81.6
Würzburg U	2.5	83.3
Top 20 in total	**116.6**	**83.3**
Other HEIs	**23.3**	**16.7**
HEIs in total	**139.9**	**100.0**
Based on: N HEIs	**68**	

Abbreviations:
HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

Source:
Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution and funding priority (based on: PROFI project database; 2002 to 2004).
Calculated by the DFG.

that are most active in terms of funding from the EU, the federal government and the AiF, an important goal of the following observations is to establish what connections exist to the distribution by research areas described above.

As explained in the previous chapter, a comparison of HEIs in terms of their third-party funding income in the research area of physics must take into account funding provided by the Federal Ministry of Education and Research (BMBF) in the "large-scale equipment for basic research" funding area. Large-scale equipment is an essential part of the research infrastructure in Germany. It is selected on the basis of a comprehensive review process by the German Science Council, which also involves external reviewers. The large-scale equipment is constructed and operated by the large research centres of the Helmholtz Association, as well as by Leibniz institutes, Max Planck institutes and by international research organisations such as CERN, the European Organisation for Nuclear Research in Geneva. Research using large-scale equipment is promoted primarily as part of BMBF-funded joint research, in which the interaction between external research groups and the equipment operators in national and international research centres is of increasing importance. Targeted funding in this area, addressed primarily to HEIs, enables high-quality research projects involving large-scale instrumentation. The priorities of the funding area "large-scale equipment for basic research" include the following: research of condensed matter and the structure and interaction of elementary particles, as well as research in mathematics, astro-

physics, hadron physics and nuclear physics.

Table 4-15 shows the participating HEIs in the order of amounts of federal funding received. The TU Munich is ranked first with €17 million in federal funding — in particular, funding for research into condensed matter, hadron physics and nuclear physics and for participation in the Munich Research Reactor. The University of Heidelberg has a broad range of subjects belonging to this funding area and is ranked second, with €13.3 million. The TH Aachen, which follows in third place with €10.4 million, is very active in the research of the structure and interaction of elementary particles; it participates in research activities at CERN and at German Electron Synchrotron (DESY) in Hamburg. These HEIs, together with Mainz, Bonn, Munich and Hamburg, which follow in the ranking, account for almost one-half of all federal funding in the "large-scale equipment for basic research" funding area.

As a supplement to the figures for physics presented above, a more differentiated picture of this research area emerges here. An overall view shows that a significant share of DFG and federal funding for R&D projects goes to the universities of Hamburg and Munich, the TU Munich, and the universities of Heidelberg, Bonn, Mainz, Bochum and Karlsruhe. It can also be seen that the TH Aachen concentrates mostly on federal funding, whereas the FU and HU Berlin, and the universities of Duisburg-Essen and Constance focus rather on DFG funding.

The life sciences-oriented funding areas of the German government and the EU Framework Programme — "R&D in the health sector", "biotechnology" and "life sciences, genomics and biotechnology for health" — are quite consistent with the figures reported above for biology and medicine, although each funding body emphasises its own research aspects. The HEIs that are well positioned in biotechnology are generally the same institutions that were leading the field according to the figures for biology (cf. Table 4-16): the universities in Göttingen and Würzburg, the HU and FU Berlin, the universities in Heidelberg, Tübingen, Frankfurt/Main, Munich (U) and the TU Munich. It can also be stated that the University of Giessen, the profile of which is dominated by the research area "veterinary medicine, agriculture and forestry", is also very active in the biotechnology-oriented funding programmes of the EU and the German government. In the funding area "R&D in the health sector", the FU and HU Berlin and the University of Munich occupy the top three ranks. In places four and five follow the University of Cologne and the Hannover Medical School, which in terms of the number of full-time professors, is relatively small.

In a comparison of all life sciences research fields, it is above all the University of Munich that must be mentioned, because it is one of the top three HEIs in terms of DFG funding, EU and federal programmes, and is among the top ten in terms of all other biology and medicine indicators. Furthermore, in the life sciences, the universities of Kiel and Bielefeld seem to concentrate more on funding from the federal ministries, while the universities of Würzburg and Mainz concentrate more on the DFG. On the whole, an overall view of the life sciences clearly confirms the results of the previous chapter.

In the thematic funding area "aeronautical and space research"[40] the University of Bremen, which received about €10 million of federal funding during the study period (cf. Table 4-17), is particularly noticeable. Along with astronomy and astrophysics, earth observation and space science are researched extensively. The TH Aachen, ranked second, received €5 million of funding for projects in the research fields of astronomy, astrophysics and space science, as well as aeronautical research and hypersonic technology. The TU Brunswick, ranked third, carries out projects concerned with solar system research, aeronautical research and hypersonic technology, and satellite communication and navigation. The University of Cologne is also involved in solar system research, astronomy and astrophysics. These four HEIs account for over a third of all federal R&D funding in this funding area.

[40] The funding area "aeronautical and space research" includes the funding priorities "aeronautical research and hypersonic technology" and "space research and space technology".

Table 4-16:
The 20 higher education institutions with the highest funding amounts in federal and EU biomedical funding areas

Direct R&D project funding by the German government						R&D funding within the EU's Sixth Research Framework Programme		
R&D in the health sector			Biotechnology			Life sciences, genomics and biotechnology for health		
Higher education institution	Mio. €	cum. %	Higher education institution	Mio. €	cum. %	Higher education institution	Mio. €	cum. %
Berlin HU	13.2	5.9	Göttingen U	14.5	7.5	Tübingen U	13.7	9.6
Berlin FU	13.1	11.7	Würzburg U	13.9	14.7	Munich U	12.2	18.3
Munich U	12.9	17.4	Munich U	12.0	21.0	Heidelberg U	11.5	26.4
Cologne U	10.5	22.1	Berlin HU	10.9	26.6	Frankfurt/Main U	8.7	32.5
Hannover MedH	9.4	26.3	Kiel U	10.7	32.1	Cologne U	7.3	37.7
Münster U	9.2	30.4	Berlin FU	10.6	37.7	Göttingen U	6.7	42.4
Freiburg U	9.2	34.4	Bielefeld U	9.6	42.7	Freiburg U	6.6	47.0
Marburg U	9.1	38.5	Heidelberg U	8.6	47.1	Giessen U	5.7	51.0
Düsseldorf U	9.1	42.5	Munich TU	8.2	51.4	Munich TU	5.3	54.8
Leipzig U	8.8	46.5	Tübingen U	7.4	55.2	Hannover MedH	5.3	58.5
Ulm U	8.7	50.3	Bonn U	6.9	58.8	Bonn U	4.1	61.4
Greifswald U	8.0	53.9	Giessen U	6.5	62.2	Würzburg U	4.0	64.3
Heidelberg U	7.6	57.3	Marburg U	5.8	65.2	Berlin FU	3.7	66.9
Bochum U	7.5	60.6	Cologne U	5.6	68.1	Berlin HU	3.6	69.4
Tübingen U	7.3	63.9	Bochum U	5.3	70.8	Hamburg U	3.6	71.9
Magdeburg U	6.9	66.9	Hamburg U	4.8	73.3	Marburg U	3.3	74.3
Rostock U	6.7	69.9	Freiburg U	4.5	75.7	Münster U	2.8	76.2
Halle-Wittenberg U	6.1	72.6	Stuttgart U	3.9	77.7	Dresden TU	2.7	78.2
Jena U	6.1	75.3	Erlangen-Nuremberg U	3.6	79.5	Bochum U	2.5	79.9
Erlangen-Nuremberg U	5.6	77.8	Münster U	3.2	81.2	Saarbrücken U	2.4	81.6
Top 20 in total	**175.3**	**77.8**	**Top 20 in total**	**156.4**	**81.2**	**Top 20 in total**	**115.7**	**81.6**
Other HEIs	**50.0**	**22.2**	**Other HEIs**	**36.2**	**18.8**	**Other HEIs**	**26.1**	**18.4**
HEIs in total	**225.2**	**100.0**	**HEIs in total**	**192.7**	**100.0**	**HEIs in total**	**141.8**	**100.0**
Based on: N HEIs	**49**		**Based on: N HEIs**	**62**		**Based on: N HEIs**	**48**	

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; MedH = Medical School; TU/TH = University of Technology; U = University

Sources:

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution and funding priority (based on: PROFI project database; 2002 to 2004).

EU Office of the BMBF: German participation in FP6 by higher education institution and thematic priority (as of 24 January 2006).

Calculated by the DFG.

On the basis of preliminary data, it can be stated that altogether only 23 German HEIs participated in projects in the thematic funding area "aeronautics and space" in the EU Framework Programme, although the range of funding provided to the various HEIs, from €1 to €4 million, suggests a very dense field of technical universities. Here, as in the case of federal funding, the relevant research is located mostly at non-university research institutions.

The funding area "energy research and energy technology" includes research fields in the areas of renewable energy and energy conservation, coal and fossil fuels and nuclear energy (particularly reactor safety research). It is mainly the technical universities that lead the field of active research HEIs in this area (cf. Table 4-17). The University of Stuttgart, ranked first, was awarded €12 million for a variety of research priorities in this funding area. It is followed by the TU Freiberg (€9 million), which focuses on "coal and other fossil fuels". The universities that follow, including Munich (TU), Aachen, Dresden and Hannover, received between €4 and €5 million for research projects in the area of "energy research and energy technology".

Table 4-17:
The 20 higher education institutions with the highest funding amounts in the federal funding areas of "aeronautical and space research", "energy research and energy technology" and "sustainable development"

Aeronautical and space research			Energy research and energy technology			Sustainable development		
Higher education institutions	Mio. €	cum. %	Higher education institutions	Mio. €	cum. %	Higher education institutions	Mio. €	cum. %
Bremen U	9.9	16.0	Stuttgart U	12.4	16.5	Dresden TU	13.0	6.9
Aachen TH	5.2	24.3	Freiberg TU	9.2	28.7	Bonn U	12.2	13.4
Brunswick TU	4.1	30.9	Munich TU	4.9	35.2	Hamburg U	10.3	19.0
Cologne U	3.5	36.5	Aachen TH	4.3	40.9	Berlin TU	8.9	23.7
Heidelberg U	2.4	40.3	Dresden TU	4.1	46.4	Bremen U	8.6	28.3
Bonn U	2.3	44.0	Hannover U	4.0	51.7	Cologne U	7.4	32.2
Berlin FU	2.2	47.6	Bremen U	3.2	56.0	Stuttgart U	7.1	36.0
Tübingen U	2.1	50.9	Darmstadt TU	2.9	59.8	Karlsruhe TH	6.6	39.6
Mainz U	2.0	54.0	Karlsruhe TH	2.5	63.2	Munich TU	6.1	42.8
Kiel U	2.0	57.2	Zittau-Görlitz H	2.2	66.1	Cottbus TU	5.5	45.7
Berlin TU	1.8	60.1	Cottbus TU	2.2	68.9	Aachen TH	4.9	48.3
Munich TU	1.8	63.0	Constance U	2.1	71.6	Bayreuth U	4.8	50.9
Stuttgart U	1.7	65.8	Hamburg-Harburg TU	1.9	74.1	Munich U	4.8	53.5
Münster U	1.5	68.2	Brunswick TU	1.8	76.5	Göttingen U	4.7	56.0
Bochum U	1.5	70.6	Berlin TU	1.7	78.7	Mainz U	4.4	58.4
Munich UdBW	1.4	72.8	Erlangen-Nuremberg U	1.5	80.8	Potsdam U	4.0	60.5
Dresden TU	1.3	74.9	Bochum U	1.5	82.7	Berlin FU	3.7	62.5
Erlangen-Nuremberg U	1.2	76.8	Jena U	1.3	84.4	Oldenburg U	3.7	64.4
Hamburg-Harburg TU	1.1	78.6	Chemnitz TU	0.9	85.6	Heidelberg U	3.7	66.4
Hamburg U	1.0	80.2	Clausthal TU	0.8	86.7	Tübingen U	3.4	68.2
Top 20 in total	**49.9**	**80.2**	**Top 20 in total**	**65.5**	**86.7**	**Top 20 in total**	**128.2**	**68.2**
Other HEIs	**12.3**	**19.8**	**Other HEIs**	**10.1**	**13.3**	**Other HEIs**	**59.7**	**31.8**
HEIs in total	**62.2**	**100.0**	**HEIs in total**	**75.6**	**100.0**	**HEIs in total**	**187.9**	**100.0**
Based on: N HEIs	**56**		**Based on: N HEIs**	**63**		**Based on: N HEIs**	**84**	

Abbreviations:

FU = Free University; H = University of Applied Sciences; TU/TH = University of Technology; UdBW = Federal Armed Forces University; U = University

Source:

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution and funding priority (based on: PROFI project database; 2002 to 2004).

Calculated by the DFG.

The thematic funding area "sustainable development", which is part of the federal R&D project funding, includes the research fields "global change" (especially climate, atmosphere and biosphere research), "socio-ecological research and regional sustainability" (e.g. R&D projects concerned with environment-related infrastructural development or ideas for sustainable use of natural resources) and "sustainable production and cleaner environmental technology" (e.g. R&D in the area of raw material-related production systems or integrated environmental protection). A closer examination of the funding received by the HEIs involved shows that each of them concentrates on its own specific priorities.

The ranking in this research field is led by the HEIs in Dresden, Berlin and Stuttgart, on the one hand, where the emphasis is on regional and economical sustainability, and integrated environmental technology, and by Bonn, Hamburg, Bremen and Cologne, on the other, which concentrate on climate, atmosphere and biosphere research.

On the whole, it can be seen that the HEIs identified in the last chapter as active researchers in the engineering sciences, also have a dominant role in the funding programme for R&D projects in the area of raw material-related production systems or integrated environmental protection. A similar finding applies to the HEIs identified as active research-

Table 4-18:
The 20 higher education institutions with the highest funding amounts in federal and EU funding areas in information technology

Direct R&D project funding by the German government			R&D funding within the EU's Sixth Research Framework Programme		
Information technology			Information society technologies		
Higher education institution	Mio. €	cum. %	Higher education institution	Mio. €	cum. %
Munich TU	10.1	7.0	Karlsruhe TH	12.4	11.1
Karlsruhe TH	10.0	14.0	Aachen TH	8.1	18.3
Lübeck FH	9.6	20.7	Stuttgart U	7.1	24.6
Berlin TU	8.4	26.6	Dresden TU	5.4	29.4
Aachen TH	7.9	32.1	Berlin TU	4.8	33.7
Stuttgart U	6.7	36.8	Freiburg U	4.3	37.5
Dresden TU	5.2	40.4	Darmstadt TU	4.3	41.3
Paderborn U	5.2	44.0	Bochum U	4.3	45.1
Brunswick TU	4.8	47.4	Paderborn U	4.1	48.7
Erlangen-Nuremberg U	4.4	50.5	Bremen U	3.8	52.1
Bochum U	4.1	53.4	Munich TU	3.3	55.1
Hannover U	3.5	55.8	Saarbrücken U	2.9	57.7
Darmstadt TU	3.4	58.1	Heidelberg U	2.7	60.1
Munich U	3.3	60.5	Munich U	2.7	62.5
Tübingen U	3.2	62.7	Kassel U	2.4	64.6
Kassel U	2.9	64.7	Hannover U	2.1	66.5
Duisburg-Essen U	2.9	66.7	Mainz U	2.0	68.3
Ilmenau TU	2.7	68.5	Magdeburg U	2.0	70.0
Bremen U	2.5	70.3	Würzburg U	1.8	71.6
Dortmund U	2.4	71.9	Duisburg-Essen U	1.8	73.2
Top 20 in total	**103.0**	**71.9**	**Top 20 in total**	**82.2**	**73.2**
Other HEIs	**40.2**	**28.1**	**Other HEIs**	**30.1**	**26.8**
HEIs in total	**143.2**	**100.0**	**HEIs in total**	**112.3**	**100.0**
Based on: N HEIs	**83**		**Based on: N HEIs**	**65**	

Abbreviations:

FH = University of Applied Sciences; HEI = Higher education institution; TU/TH = University of Technology; U = University

Sources:

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution and funding priority (based on: PROFI project database; 2002 to 2004).

EU Office of the BMBF: German participation in FP6 by higher education institution and thematic priority (as of 24 January 2006).

Calculated by the DFG.

ers in the geosciences. The majority of the funding for R&D projects relating to climate, atmosphere and biosphere research thus goes to the ten HEIs with the highest DFG funding in the geosciences research area. It should be mentioned here that, in spite of their diverse thematic priorities, the five HEIs with the highest DFG funding in the research area of geosciences also account for over 40% of the geosciences[41] funding provided by federal R&D project funding.

A comparison of the indicators in "information technology" also results in a very homogenous picture. The twenty HEIs with the highest DFG funding in the research area "computer science, electrical and system engineering" account for more than 50% of all federal R&D funding in the funding area "information technology" and in the Sixth EU Framework Programme funding area "information society technologies". The TH Karlsruhe has an exceptional position in this context, ranking first or second in all three funding programmes, while the TH Aachen, as shown in Table 4-18, is one of the top five HEIs in the relevant funding areas. Other HEIs that are particularly active in

[41] The funding area "geosciences" combines the thematic areas "marine and polar research", "geosciences" and "marine technology".

Table 4-19:
The 20 higher education institutions with the highest funding amounts in the EU funding area of "nanotechnologies and nanosciences, knowledge-based multifunctional materials, and new production processes and devices"

Higher education institution	Mio. €	cum. %
Aachen TH	6.7	11.1
Munich TU	5.0	19.4
Stuttgart U	4.8	27.4
Saarbrücken U	3.2	32.8
Hannover U	3.2	38.0
Münster U	2.6	42.4
Dortmund U	2.6	46.7
Darmstadt TU	2.5	50.9
Karlsruhe TH	2.2	54.5
Leipzig U	2.0	57.8
Ulm U	1.9	61.1
Bochum U	1.4	63.4
Kassel U	1.3	65.6
Munich U	1.3	67.7
Heidelberg U	1.2	69.8
Bremen U	1.2	71.8
Mainz U	1.2	73.8
Kaiserslautern TU	1.1	75.6
Berlin HU	1.1	77.4
Hamburg U	1.0	79.1
Top 20 in total	**47.4**	**79.1**
Other HEIs	**12.5**	**20.9**
HEIs in total	**60.0**	**100.0**
Based on: N HEIs	**51**	

Abbreviations:
HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

Source:
EU Office of the BMBF: German participation in FP6 by higher education institution and thematic priority (as of 24 January 2006).
Calculated by the DFG.

this area include the technical universities in Munich, Dresden, Berlin and the University of Stuttgart. Other HEIs that are also found in the first raking group for these funding programmes include the Lübeck University of Applied Sciences[42] and the universities in Bochum, Brunswick, Bremen, Darmstadt, Dortmund, Erlangen-Nuremberg, Freiburg and Paderborn.

Table 4-19 shows the twenty most active HEIs in the funding area of "nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices". In this thematic funding area, according to the records from January 2006, scientists working at HEIs received €60 million in third-party funding from the EU. The highest amounts went to the TH Aachen, the TU Munich and the University of Stuttgart. As shown by Figure 3-4 in chapter 3, funding in this area accounts for a large share of the total amount of EU funding received, above all at the TU Munich, the universities of Hannover and Dortmund and the TU Darmstadt. The TH Aachen also ranked first in the research area comparisons for industrial engineering, thermal and process engineering and materials science presented above, and the other HEIs that participate most frequently in the EU programmes considered here also have high positions in the DFG ranking.

Finally, Table 4-20 shows to what extent HEIs participated in the industri-

[42] The Federal Pilot Project for a Virtual University of Applied Sciences, among other things, is located at Lübeck.

Table 4-20:
The 20 higher education institutions with the highest funding amounts in the German Federation of Industrial Research Associations' (AiF) industrial cooperative research programme (IGF)

Higher education institution	Mio. €	cum. %
Aachen TH	17.4	16.3
Dresden TU	10.0	25.6
Munich TU	9.4	34.4
Hannover U	6.7	40.7
Stuttgart U	6.0	46.3
Darmstadt TU	5.7	51.6
Brunswick TU	4.0	55.4
Dortmund U	3.7	58.8
Clausthal TU	3.6	62.1
Paderborn U	3.5	65.5
Chemnitz TU	3.4	68.7
Magdeburg U	3.1	71.6
Freiberg TU	2.7	74.1
Karlsruhe TH	2.6	76.5
Bochum U	2.1	78.5
Kassel U	1.9	80.2
Hamburg-Harburg TU	1.7	81.8
Erlangen-Nuremberg U	1.6	83.3
Berlin TU	1.6	84.8
Hohenheim U	1.3	86.0
Top 20 in total	**91.8**	86.0
Other HEIs	**15.0**	14.0
HEIs in total	**106.8**	100.0
Based on: N HEIs	**78**	

Abbreviations:
HEI = Higher education institution; TU/TH = University of Technology; U = University

Source:
German Federation of Industrial Research Associations (AiF): Industrial cooperative research funding by higher education institution (2002 to 2004).
Calculated by the DFG.

al cooperative research (IGF) programme run by the AiF. To be eligible for funding, projects must: be scientific-technical R&D projects with an industry-wide focus; be expected to lead to new insights that support the development and use of modern technologies; and bring commercial advantages to small- and medium-sized firms.

As shown by the table, the TH Aachen has an outstanding position in the IGF programme. With €17 million, this university in Rhineland-Westphalia accounts for more than 15% of all IGF-funding managed by the AiF and awarded to HEIs. It is followed by the TU Dresden and the TU Munich, with approximately €10 million each. The 6 leading HEIs account for almost 50% of all funding that went to HEIs. In addition to the TU Dresden, three further eastern German universities are in the top group of funding recipients: the TU Chemnitz, the University of Magdeburg and the TU Freiberg. Generally speaking, technical universities are featured prominently among the group of universities that participate in the industrial cooperative research programme. These are especially institutions that, in terms of DFG funding, have outstanding positions in the subject areas of mechanical engineering. HEIs with substantial DFG funding in mechanical engineering are therefore of special importance for knowledge transfer in the context of industrial joint research and of the research associations of the AiF.

5. Overview

The following overview summarises, the indicators used in the 2006 Funding Ranking. The positions of the 40 higher education institutions with the highest DFG funding in relation to these indicators are then presented. The comparison is made for the 40 highest funded HEIs in both absolute and in relative terms. Then the most important general findings are summarised, followed by some concluding remarks.

5.1 Indicators Used and Report Focuses

In addition to the general basic data, this ranking uses the following twelve indicators, assigned to four different categories. The postfix "(RA)" means that the indicator was used for comparisons at the level of DFG research areas (chapter 4).

1. Basic data
   - > HEI personnel (2003)
   - > HEI expenditure (2001 to 2003)
2. Third-party funding indicators
   - > General third-party funding income of HEIs (2001 to 2003) (RA)
   - > DFG awards (2002 to 2004) (RA)
   - > Direct R&D project funding by the German government (2002 to 2004)
   - > R&D funding in the Sixth EU Framework Programme (as of January 2006)
   - > AiF funding for R&D (2002 to 2004)
3. Scientific expertise and top-level researchers
   - > DFG review board members (election period 2004 to 2007)
   - > DFG reviewers (2002 to 2004) (RA)
   - > Leibniz prizewinners (1986 to 2005)
4. International appeal
   - > AvH visiting researchers (2000 to 2004) (RA)
   - > DAAD-funded foreign visiting researchers (2002 to 2004) (RA)
5. Research-related cooperative activities and networks
   - > Participation in cooperative DFG research programmes (2002 to 2004) (RA)
   - > Number of institutions cooperated with in these programmes (2002 to 2004) (RA)

The third-party funding indicators listed above are of special importance in this ranking. The term "third-party funding income" refers to funds that do not originate from the basic finance budget provided by the responsible ministries, but that are actively acquired by scientists and academics from various public and commercial funding bodies. In relation to the general significance of third-party funding, the following points can be made:

- > According to figures from the Federal Statistical Office, between 2001 and 2003 scientists and academics at German HEIs received a total of €9.8 billion in third-party funding. **The DFG was responsible for 31% of this amount. It is thereby the largest single funding body for third-party funded research at German higher education institutions.**

- Third-party funding accounts for 13% of the total income of the HEIs that make up the central focus of this study. Other elements of the total income include basic funds (almost 49%) and administrative income (38%). The majority of the administrative income (96%) stems from university hospitals. If this is excluded from the calculation, the share of third-party funding is a little over 21%, and that of basic funds is accordingly almost 79%.
- Between 2002 and 2004, the DFG awarded a total of €3.7 billion as part of their subject-related programmes. The 84 HEIs that form the central focus of this study account for a total of €3.2 billion, or 88% of the funding allocated by the DFG in these programmes. The remaining amount went mostly to non-university research institutions (11%).
- The data on **direct R&D project funding by the German government**, included for the first time in the current ranking, amounts to €4.4 billion during the funding period from 2002 to 2004. HEIs accounted for 31% of this amount, and roughly €1 billion, or 78% of this, went to the 40 HEIs with the highest DFG funding.
- Data on the **Sixth EU Framework Programme** were available in the form of a "half-time balance" (based on project data recorded up to January 2006). The figures provided by the EU Office of the BMBF cover funding allocations in the amount of €9.7 billion. German participants received the highest share of this, with €1.8 billion, followed by the United Kingdom, France, Italy and the Netherlands. A share of 32% of the funding allocated to Germany went to scientists and academics working at HEIs, and 85% of this went to the 40 HEIs with the highest DFG funding.
- Between 2002 and 2004, the **German Federation of Industrial Research Associations "Otto von Guericke" (AiF)** provided a total of €270 million for research purposes as part of its industrial cooperative research (IGF) programme. Almost 40% of this went to HEIs, and in particular to 20 predominantly technical universities (€92 million, or 86% of all funding received by HEIs from the AiF).[1]

Funds received as third-party funding represent an important source of finance for research at HEIs and non-university research institutions. **With the above-mentioned sources, this ranking covers an estimated 80% of the total range of third-party funding for research at HEIs awarded by public funding bodies.** This provides a very good basis for an institutional comparative analysis.

The indicators were used in the previous chapters to create comparative rankings that were differentiated by research and funding areas. The analyses of 14 research areas were based on seven different indicators, labelled "RA" in the list above. A supplementary analysis differentiated by specific funding areas (e.g. biotechnology and information technology) was based on figures for direct R&D project funding by the federal government and for R&D funding in the Sixth EU Framework Programme. Finally, data on AiF funding, relating to the industrial cooperative research (IGF) programme, show which HEIs are especially active in technology and knowledge transfer to small- and medium-sized firms.

For reasons of statistical reliability, and due to the small number of cases, two further indicators — the number of DFG review board members at an HEI and the number of Leibniz prizewinners in the last 20 years — are only used for the cross-institutional rankings presented below.

Further details on the indicators used in the 2006 Funding Ranking can be found in chapter 2, and tables differentiated by research area can be found in the appendix.

The central focus of this study is formed by 84 HEIs that each received more than €0.5 million in funding from the DFG during the period from 2002 to 2004. This amount corresponds to an average of about four individual funding awards in three years; the entry requirement is therefore set quite low. The tables in the appendix also give figures for non-

[1] Due to the emphasis on technical universities, funding received as part of the IGF programme is not included in the indicator comparison that follows; the figures for the 20 HEIs that were significantly involved in the programme are given in section 4.5.

university research institutions, although they are limited to the funding activities of the DFG. These institutions — alongside HEIs with smaller DFG budgets — are also included in analyses that take the form of visualisations of cross-institutional cooperation in DFG-funded coordinated programmes (chapter 4). Furthermore, they are included in the totals that give the funding volumes of individual research regions, presented in section 3.5 in cartographic form.

5.2 Indicator Comparison at the Institutional Level

The profile analyses (chapter 3), developed for the first time for this ranking, and the presentations of individual research and funding areas have shown the different (publicly funded) research behaviour exhibited by the various institutions considered here — in terms of the amount of research activity they carry out and their various priorities. In one location, medical research takes priority, and in another, the emphasis is put on mechanical engineering. Some institutions concentrate on the humanities, while others focus on chemistry or physics. Each institution has a specific research profile and has a competitive position in its own research fields.

If HEIs are presented in the following as complete institutions that compete for funding or international visiting researchers, this is against the background of a finding reported in the 2003 Funding Ranking: third-party funded research is concentrated mainly in a limited number of institutions that are particularly successful third-party funding recipients, in absolute terms and/or relative to the number of professors working there. The positions of these institutions in relation to a broad set of indicators are shown here, and this allows conclusions to be drawn regarding the general research conditions at these very institutions. These conditions apply in different ways from one faculty to the next, but they are nevertheless an important determining factor.

The following tables assign the 40 HEIs with the highest DFG funding volumes to ranking groups based on the individual indicators. Table 5-1 gives the ranking based on absolute values, and the ranking given in Table 5-2 is relative to the number of professors working at these institutions, according to data from the Federal Statistical Office (as of 2003).

These tables present a comparison of ranking groups. This allows for the fact that the difference between one ranking position and the next can be based on very small amounts and does not provide a good basis for interpretation. Ranking groups generally include ten institutions each (ranks 1 to 10, ranks 11 to 20, etc.). In relation to the third-party funding indicators used here, HEIs are considered to have the same ranking if there is not more than €100,000 difference between their funding volumes. In the DFG ranking, the University of Frankfurt/Main and the TU Dresden are therefore both ranked 20th (second ranking group), and the TU Berlin thus follows in 22nd place (third ranking group).

Beginning with **Table 5-1**, which gives a ranking sorted by the absolute amount of DFG funding received, and with reference to the individual findings presented in chapter 4 for the research and funding areas of the DFG, the EU and the German government, the main results are presented below.

The ten main DFG funding recipients generally also occupy leading positions in relation to the other indicators used here for reasons of comparison. This applies especially to the **two universities in Munich**, the universities in **Heidelberg** and **Tübingen** and to the **FU** and **the HU Berlin**. The latter only appears in the third ranking group (22 to 30) because of the number of researchers working there that have been awarded the Leibniz Prize. This is put into perspective by the fact that it is only since the early 1990s that the HU Berlin (like other eastern German universities) has been able to provide prizewinners in this programme, which was established by the DFG in 1986.

The first 20 HEIs account for 56% of all DFG awards — the same figure that was ascertained in the previous ranking. With regard to direct project funding by the federal government, they account for 50%, and according to the half-time balance in the Sixth EU Framework Programme considered in this ranking, they account for 60% of the funding. **This**

image of high concentration in a few HEIs is confirmed by the other indicators shown in the table.

The **University of Würzburg** proves to have a comparatively strong orientation towards the DFG. Research here is concentrated primarily on medicine and biology, with about 78% of its DFG funding going to the life sciences. The university accordingly leads the research area-based DFG ranking for medicine and is ranked second in biology. In the funding area of biotechnology, the University of Würzburg is also well placed in terms of funding from the federal government (cf. chapter 4).

The **FU Berlin** stands out especially in terms of the "per capita indicators". This university is characterised by a large number of Leibniz prizewinners, review board members, reviewers and international visiting researchers, and it also has a central position in terms of cooperation networks that result from participation in DFG-funded coordinated programmes. At the same time, its profile is determined by humanities research that is relatively strong in terms of third-party funding (ranked first in the DFG ranking for this area). The life sciences, however, form the main focus of research, and the FU Berlin is very active in the relevant programmes of the EU and the German government. Its high ranking in the research areas of physics, mathematics and the geosciences should also be stressed.

It is primarily the **University of Stuttgart** that stands out in the second ranking group, which contains eleven institutions due to Frankfurt/Main and the TU Dresden having the same funding amounts. In terms of the funding it received from the EU and the German government (in programmes such as "energy research and energy technology", "information technology" and "sustainable development") and according to the figures for third-party funding recorded by the Federal Statistical Office, it is one of the top-ten institutions; the two network indicators also place Stuttgart in this leading group.

On the basis of preliminary data, the **universities of Göttingen** and **Freiburg** received substantial amounts of funding from the EU as part of the Sixth Framework Programme (especially in biosciences), and they also provided a high number of DFG reviewers and review board members. Göttingen was also an attractive destination for visiting researchers funded by the AvH and the DAAD.

The **University of Bonn** is among the ten HEIs that received the highest project-related income from the federal government. Its research priorities were mainly in the funding areas of "R&D in the health sector", "biotechnology" and "sustainable development". This university on the Rhine also employs many scientists and academics who were active as DFG reviewers during the study period; it is the first choice for AvH-funded visiting researchers and — similar to Göttingen, Freiburg and Frankfurt — has produced a high number of Leibniz prizewinners in the last 20 years.

The **TU Dresden**, which has risen to this ranking group for the first time, should also be mentioned here. It is distinguished above all by its above-average third-party funding from the federal government, relative to the amount of DFG funding it has been awarded. Here and in terms of its total third-party funding income, it ranks as one of the ten HEIs with the highest incomes. In its DFG-funded research activities, as well as those funded by the EU and the federal government, Dresden places a clear thematic emphasis on information technology, and is also active in a number of other research fields. In the scientific community, this performance is clearly recognised in that the **TU Dresden**, together with the **HU Berlin**, is at the top of the review board members ranking — from no other universities have so many scientists and academics been elected to this pivotal DFG committee.

In the third ranking group (nine HEIs) based on total DFG funding volumes, the **University of Bremen** should be noted first of all. The profile of this institution, with its strong focus on the natural and engineering sciences and on the geosciences (ranked first in the DFG funding ranking for this research area), is based to a large extent on funding from the federal government (especially in the funding areas of "aeronautical and space research", ranked first, "energy research and energy technology" and "sustainable development") and is found accord-

Table 5-1:
Summarised comparison of indicators for the 40 higher education institutions with the highest DFG funding volumes in absolute terms

Higher education institution	Third-party funding income[1)]							
	DFG awards		Direct R&D project funding by the German government		R&D funding in FP6		Third-party funding income as per Federal Statistical Office	
	Mio. €	cum. %	Mio. €	cum. %	Mio. €	cum. %	Mio. €	cum. %
Munich U	130.8	4.0	43.2	3.2	28.5	5.0	368.3	3.8
Aachen TH	126.2	7.9	54.4	7.2	27.2	9.7	406.5	7.9
Heidelberg U	105.1	11.2	39.6	10.1	25.7	14.2	281.0	10.8
Würzburg U	104.7	14.4	26.1	12.0	7.3	15.4	175.3	12.5
Berlin HU	101.5	17.5	30.8	14.3	11.7	17.5	313.0	15.7
Karlsruhe TH	100.5	20.6	32.8	16.7	22.0	21.3	232.3	18.1
Erlangen-Nuremberg U	100.3	23.7	26.4	18.6	8.4	22.8	239.2	20.5
Tübingen U	99.7	26.8	26.0	20.5	25.2	27.2	218.9	22.8
Munich TU	99.3	29.9	60.7	25.0	28.5	32.1	409.4	26.9
Berlin FU	96.6	32.8	34.3	27.5	11.9	34.2	231.3	29.3
Freiburg U	91.1	35.7	27.2	29.5	13.9	36.6	230.8	31.6
Göttingen U	85.1	38.3	28.9	31.6	14.3	39.1	226.9	33.9
Bonn U	81.9	40.8	37.6	34.4	13.2	41.4	213.4	36.1
Stuttgart U	79.1	43.3	45.1	37.7	34.6	47.4	322.1	39.4
Münster U	73.5	45.5	22.6	39.4	8.9	49.0	191.0	41.3
Bochum U	73.3	47.8	30.1	41.6	13.2	51.2	180.6	43.2
Hamburg U	72.1	50.0	34.4	44.1	11.6	53.3	190.1	45.1
Cologne U	70.7	52.2	34.3	46.7	11.0	55.2	185.1	47.0
Mainz U	69.2	54.3	26.1	48.6	13.5	57.5	172.4	48.8
Frankfurt/Main U	66.5	56.4	13.8	49.6	15.7	60.3	184.5	50.6
Dresden TU	66.5	58.4	44.2	52.9	12.9	62.5	249.8	53.2
Berlin TU	63.6	60.4	33.4	55.3	12.5	64.7	213.7	55.4
Bremen U	62.2	62.3	34.5	57.9	9.3	66.3	188.6	57.3
Hannover U	60.2	64.2	20.4	59.4	10.9	68.2	168.9	59.0
Darmstadt TU	53.8	65.8	18.2	60.7	11.7	70.2	165.8	60.7
Giessen U	50.4	67.4	15.2	61.8	9.1	71.8	120.7	61.9
Marburg U	50.3	68.9	18.8	63.2	5.5	72.8	104.1	63.0
Duisburg-Essen U	49.7	70.5	15.7	64.3	6.4	73.9	180.5	64.8
Düsseldorf U	49.0	72.0	14.8	65.4	5.4	74.8	111.8	66.0
Jena U	46.8	73.4	18.3	66.8	5.0	75.7	111.0	67.1
Brunswick TU	45.9	74.8	19.5	68.2	4.1	76.4	125.4	68.4
Dortmund U	45.8	76.2	11.0	69.0	5.2	77.3	104.1	69.4
Ulm U	44.5	77.6	16.5	70.2	6.9	78.5	134.8	70.8
Constance U	43.7	79.0	3.5	70.5	5.0	79.4	65.6	71.5
Halle-Wittenberg U	41.3	80.2	17.3	71.8	1.6	79.7	103.9	72.5
Kiel U	41.0	81.5	27.1	73.8	5.0	80.5	155.9	74.1
Regensburg U	40.0	82.7	8.2	74.4	2.8	81.0	109.5	75.2
Bielefeld U	40.0	84.0	18.0	75.7	5.7	82.0	92.5	76.2
Saarbrücken U	39.3	85.2	9.5	76.4	10.4	83.8	103.9	77.2
Leipzig U	38.4	86.4	18.4	77.8	5.2	84.7	123.2	78.5
Top 40 in total	**2,799.3**	**86.4**	**1,056.8**	**77.8**	**487.1**	**84.7**	**7,705.8**	**78.5**
Other HEIs	**441.8**	**13.6**	**302.3**	**22.2**	**87.8**	**15.3**	**2,112.9**	**21.5**
HEIs in total	**3,241.1**	**100.0**	**1,359.1**	**100.0**	**574.9**	**100.0**	**9,818.6**	**100.0**
Based on: N HEIs	**154**		**186**		**98**		**285**	

Legend: Ranking group

1 to 10 | 11 to 20 | 21 to 30 | 31 to 40 | 41 to 60 | 61 and other

Abbreviations:
FU = Free University; HEI = Higher education institution; HU = Humboldt University; TU/TH = University of Technology; U = University

[1)] Please note that the figures listed here can only be compared to some extent. In this respect, DFG awards span several years, federal and EU funding refer to the amounts listed, and the „third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

Sources:
Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) (2002 to 2004), Leibniz prizewinners (1986 to 2005) and DFG review board members (2004 to 2007) by higher education institution.

Table 5-1 (continued):
Summarised comparison of indicators for the 40 higher education institutions with the highest DFG funding volumes in absolute terms

Higher education institution	Scientific expertise and top-level researchers						International appeal				DFG cooperative research programmes		
	DFG Leibniz prizewinners		DFG review board members		DFG reviewers		AvH visiting researchers		DAAD researchers		Collaborations		Partner institutions
	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum. %	N	cum.%	N
Munich U	12	5.8	12	2.4	317	4.0	202	5.6	110	3.1	62	3.7	61
Aachen TH	6	8.7	17	5.8	194	6.5	84	7.9	91	5.6	39	6.0	35
Heidelberg U	11	14.1	10	7.8	250	9.6	154	12.1	98	8.3	57	9.4	56
Würzburg U	7	17.5	12	10.1	179	11.9	68	14.0	54	9.8	44	12.1	59
Berlin HU	3	18.9	26	15.3	216	14.6	164	18.5	186	15.0	87	17.3	89
Karlsruhe TH	3	20.4	4	16.1	151	16.5	77	20.6	73	17.0	35	19.4	37
Erlangen-Nuremberg U	2	21.4	14	18.9	237	19.5	112	23.7	62	18.7	40	21.8	55
Tübingen U	8	25.2	17	22.3	250	22.7	112	26.8	89	21.2	45	24.5	59
Munich TU	7	28.6	12	24.7	248	25.8	172	31.5	45	22.4	64	28.3	73
Berlin FU	11	34.0	16	27.8	232	28.7	172	36.3	178	27.4	65	32.2	88
Freiburg U	9	38.3	21	32.0	239	31.7	98	38.9	80	29.6	28	33.9	31
Göttingen U	7	41.7	14	34.8	219	34.5	118	42.2	107	32.6	37	36.1	47
Bonn U	7	45.1	12	37.2	250	37.7	133	45.9	74	34.6	41	38.5	46
Stuttgart U	4	47.1	8	38.8	139	39.4	91	48.4	65	36.4	44	41.1	58
Münster U	6	50.0	16	41.9	202	42.0	84	50.7	59	38.1	24	42.6	29
Bochum U	5	52.4	12	44.3	192	44.4	90	53.2	84	40.4	45	45.3	37
Hamburg U	3	53.9	12	46.7	207	47.0	85	55.5	78	42.6	33	47.2	45
Cologne U	6	56.8	13	49.3	196	49.5	110	58.5	57	44.2	30	49.0	48
Mainz U	3	58.3	9	51.1	168	51.6	60	60.2	37	45.2	33	51.0	37
Frankfurt/Main U	8	62.1	6	52.3	174	53.8	104	63.0	64	47.0	37	53.2	37
Dresden TU	1	62.6	26	57.5	148	55.7	58	64.6	92	49.5	35	55.3	55
Berlin TU	5	65.0	9	59.2	141	57.5	87	67.0	77	51.7	49	58.3	64
Bremen U	1	65.5	3	59.8	80	58.5	20	67.6	52	53.1	13	59.0	27
Hannover U	1	66.0	10	61.8	110	59.9	41	68.7	87	55.5	26	60.6	33
Darmstadt TU	2	67.0	12	64.2	120	61.4	77	70.8	57	57.1	35	62.7	56
Giessen U	0	67.0	9	66.0	131	63.0	54	72.3	81	59.3	33	64.7	51
Marburg U	9	71.4	9	67.8	132	64.7	63	74.0	43	60.5	28	66.3	47
Duisburg-Essen U	3	72.8	2	68.2	138	66.4	50	75.4	34	61.5	22	67.6	21
Düsseldorf U	3	74.3	4	69.0	123	68.0	31	76.3	38	62.5	21	68.9	35
Jena U	1	74.8	8	70.6	117	69.5	32	77.2	40	63.6	22	70.2	40
Brunswick TU	2	75.7	10	72.6	104	70.8	25	77.8	33	64.6	16	71.2	30
Dortmund U	0	75.7	5	73.6	92	72.0	25	78.5	25	65.3	26	72.7	31
Ulm U	2	76.7	5	74.6	106	73.3	62	80.2	27	66.0	15	73.6	30
Constance U	5	79.1	5	75.5	86	74.4	54	81.7	36	67.0	21	74.9	35
Halle-Wittenberg U	1	79.6	9	77.3	105	75.7	25	82.4	53	68.5	24	76.3	30
Kiel U	5	82.0	6	78.5	138	77.4	52	83.8	51	69.9	19	77.5	35
Regensburg U	2	83.0	4	79.3	114	78.9	52	85.3	18	70.4	21	78.7	30
Bielefeld U	6	85.9	4	80.1	88	80.0	55	86.8	36	71.4	27	80.3	43
Saarbrücken U	7	89.3	3	80.7	112	81.4	39	87.9	30	72.2	22	81.6	30
Leipzig U	0	89.3	10	82.7	99	82.7	39	88.9	84	74.6	24	83.1	28
Top 40 in total	**184**	**89.3**	**416**	**82.7**	**6,544**	**82.7**	**3,231**	**88.9**	**2,685**	**74.6**	**1,389**	**83.1**	**–**
Other HEIs	**22**	**10.7**	**87**	**17.3**	**1,373**	**17.3**	**402**	**11.1**	**916**	**25.4**	**283**	**16.9**	**–**
HEIs in total	**206**	**100.0**	**503**	**100.0**	**7,916**	**100.0**	**3,633**	**100.0**	**3,601**	**100.0**	**1,672**	**100.0**	**–**
Based on: N HEIs	**51**		**71**		**136**		**68**		**154**		**90**		

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 to 40	41 to 60	61 and other

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution (based on: PROFI project database; 2002 to 2004).
EU Office of the BMBF: German participation in FP6 by higher education institution (as of 24 January 2006).
Federal Statistical Office: Third-party funding income in total by higher education institution (2001 to 2003).
Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution (2000 to 2004).
German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution (2002 to 2004).
Calculated by the DFG.

ingly among the top ten recipients of federal funding (total third-party funding income: second ranking group).

The **TU Berlin**, which is in 22nd place in the DFG ranking, is found in the second group of most of the other rankings used here for reasons of comparison. Frequent participation in DFG coordinated programmes is characteristic of this institution (first ranking group). With regard to research areas, the TU Berlin stands out in mathematics (ranked first in for DFG awards), industrial engineering and thermal and process engineering, while it is also very active in the federal funding area of "sustainable development" and in "information technology" (EU and German government).

In the fourth ranking group, the **University of Kiel** has a special position. This north German institution is among the 20 HEIs that received the highest third-party funding income from the federal government, and compared to the rest of the group, it has an above-average number of Leibniz prizewinners. In relation to individual research areas, the university has a high ranking in the areas of "veterinary medicine, agriculture and forestry" and above all in the geosciences. In terms of federal funding, Kiel is also very active in biotechnology.

With a total of seven Leibniz prizewinners in 20 years, **University of Saarbrücken** also has a place in the top group with respect to this indicator of excellence. In the EU thematic funding area of nanotechnology, this is one of the five most highly funded HEIs, and it achieved a place in the second ranking group in both the EU funding area "information society technologies" and in the DFG research area "computer science, electrical and system engineering".

In relation to the congruency of the various indicators it may be stated that the top group presents a very coherent picture: **Munich (U)**, **Aachen** and **Heidelberg** are located in the top ranking group for all four third-party funding indicators, and in terms of all other indicators, they are among the leading 20 HEIs. The **University of Munich** has been allocated most often to top ranking groups — only in regard to the number of DFG review board members (with a difference of only one member) is it to be found in the second ranking group. The **University of Heidelberg** has a comparably broad range of leading positions, and it too has a somewhat lower number of review board members. Other consistently high-ranking HEIs in the top group include the **University of Tübingen**, the **TU Munich** and the **HU and FU Berlin**.

Altogether, the 40 HEIs with the highest DFG funding received 86% of the total DFG funding allocated to HEIs, 78% of all funds awarded by the federal government as part of its direct funding of R&D projects, 85% of all EU funding and 79% of the total third-party funding received by HEIs (according to a special survey by the Federal Statistical Office). They supply 89% of all Leibniz prizewinners working at higher education institutions (1986 to 2005), 83% of all DFG review board members (2003 election) and a comparably high proportion of the DFG reviewers consulted in the written review process. Finally, they are also the destination institutions for 89% of all AvH-funded and 75% of all DAAD-funded research stays at German HEIs (higher education institutions are used as the basis for calculating the percentages in each case).

Table 5-2 shows the connections between the various indicators, relative to the number of professors working at these institutions.[2] As might be expected, this point of view presents a very different picture. But here too, there is broad agreement between the various indicators. What is initially remarkable is the large overlap with the top group from the ranking based on absolute figures. As in the previous ranking, six of the ten HEIs with the highest total DFG funding — the **TH Aachen**, the **TH Karlsruhe,** the **TU Munich** and the universities of **Heidelberg**, **Würzburg** and **Tübingen** — are also found in the top ten institutions in terms of DFG funding per professor. The other leading institutions in this relative ranking include **Hannover Medical School** and the **universities of Stuttgart**, **Constance** and **Freiburg**. None of these ten relatively highest-funded HEIs are among the ten largest HEIs in Germany (measured by the number of professors).

[2] Cf. Table A-9 in the appendix for all HEIs covered in this report. Tables A-10 to A-13 give the relevant figures differentiated by four scientific disciplines.

Even from a broader point of view, the absolute and relative rankings are still fairly consistent: **33 institutions are in the top 40 group of both the absolute and the relative rankings**, which means that 47 HEIs are found in at least one of these two ranking procedures. There is therefore a close relationship between the absolute volume of DFG funding and the per capita income of an institution.

The **smaller institutions** also managed to achieve prominent positions in terms of both their absolute DFG funding and of other comparison indicators, as shown by the results presented in this report for individual research areas (DFG) and funding areas (EU and German government). The **University of Mannheim** is a good example of this. In the total ranking it occupies 52nd place, and with 118 professors it is significantly smaller than the 40 HEIs with the highest DFG funding. However, due to its strong focus on business studies and social sciences, Mannheim ranks second in the social and behavioural sciences — between the much larger University of Munich and the HU Berlin. In the research area "veterinary medicine, agriculture and forestry", the **Veterinary University of Hannover** managed to reach the top five HEIs, and the TU Freiberg, with its emphasis on materials science, is found among the 10 highest-funded institutions in this area. Finally, the **Bauhaus University Weimar** has a prominent place in "construction engineering and architecture" (ranked fifth).

In terms of participation in federal and EU programmes, the **TU Freiberg** is also well positioned, ranking second in the area "energy research and energy technology". In the funding areas of information technology (federal government) and "information society technologies" (EU), the **University of Paderborn** managed to gain a place in the top ranking group.

In all of these cases, specialisation in specific areas has helped these institutions attain their prominent positions.

In relation to the four indicators of third-party funding used here — DFG funding, direct R&D project funding by the federal government, EU funding in the Sixth Framework Programme and general third-party funding income according to various surveys by the Federal Statistical Office — it is primarily the top of the field that presents a clear and distinct picture. In all four points, the top ranking group includes those institutions that have the highest relative DFG funding, including the **TH Karlsruhe**, **Hannover Medical School**, the **TH Aachen** and the **TU Munich**, and the **University of Stuttgart,** which is in the second group in the absolute ranking. The relative ranking table also shows that Würzburg is strongly oriented towards DFG funding, as are **Constance** and **Freiburg**, although they also received substantial sums from the EU in relative terms.

Furthermore, in relation to the HEIs with the highest relative volumes of DFG funding, it may be stated that:

- Five of the ten HEIs in the top ranking group also feature in the relative Leibniz Prize ranking among the ten institutions with the most prizewinners, and three more are in the top twenty. Only for the Hannover Medical School have no Leibniz prizewinners been documented.
- In relation to the relative number of review board members, however, the top ranking group is not very representative. Only three HEIs, Aachen, Tübingen and Freiburg, are also found under the top ten in this category.
- The level of correlation with the third indicator for "scientific expertise and top-level researchers" is especially high: eight of the ten HEIs with the highest DFG funding also provide the highest number of DFG reviewers. There is a ratio here of from approx. 50 to 70 DFG reviewers for every 100 professors working at these institutions. The general average for the HEIs covered in this study is 37 reviewers in three years.
- With regard to their international appeal, the leading HEIs in the relative DFG ranking are also quite prominent, with six of them belonging to the ten institutions that are, in relative terms, the most frequently visited by AvH-funded visiting researchers. For every 100 professors, between 30 and 42 AvH-funded research stays in five years are documented for these institutions.

Table 5-2:
Summarised comparison of indicators for the 40 higher education institutions with the highest DFG funding volumes in relative terms

Higher education institution[1]	Professors	Third-party funding income[2]			
		DFG awards	Direct R&D project funding by the German government	R&D funding in FP6	Third-party funding income as per Federal Statistical Office
	N	K € per prof.	K € per prof.	K € per prof.	K € per prof.
Karlsruhe TH	247	406.9	132.6	89.0	940.1
Hannover MedH	102	329.7	127.0	63.8	1,107.6
Aachen TH	391	323.1	139.3	69.7	1,041.0
Stuttgart U	254	311.2	177.7	136.2	1,268.1
Constance U	153	286.3	22.9	33.1	430.4
Würzburg U	368	285.0	71.1	19.9	476.8
Tübingen U	366	272.7	71.0	69.0	598.9
Heidelberg U	409	257.1	96.8	62.9	687.7
Freiburg U	361	252.1	75.2	38.5	639.0
Munich TU	410	242.2	147.9	69.4	998.2
Ulm U	190	235.0	87.2	36.5	711.4
Erlangen-Nuremberg U	472	212.5	55.8	17.8	506.8
Darmstadt TU	267	201.4	68.1	43.9	620.8
Göttingen U	423	201.0	68.2	33.7	535.9
Bochum U	373	196.3	80.5	35.3	484.1
Lübeck U	72	195.5	146.7	39.5	681.2
Brunswick TU	237	193.7	82.2	17.1	529.3
Berlin TU	329	193.3	101.7	38.0	649.8
Munich U	707	185.0	61.1	40.4	521.1
Bremen U	339	183.8	101.9	27.4	557.2
Berlin FU	529	182.5	64.8	22.5	437.1
Berlin HU	563	180.2	54.7	20.8	555.7
Hannover U	338	178.4	60.4	32.4	500.4
Clausthal TU	76	178.0	66.4	29.3	654.0
Düsseldorf U	277	176.8	53.5	19.5	403.2
Bonn U	477	171.9	78.9	27.8	447.9
Mainz U	413	167.3	63.1	32.8	417.0
Bayreuth U	182	164.7	31.4	24.6	352.6
Bielefeld U	245	163.3	73.7	23.3	377.8
Dortmund U	283	161.8	38.8	18.2	367.9
Kaiserslautern TU	164	159.1	46.9	17.3	518.8
Chemnitz TU	156	156.9	50.7	12.2	377.7
Saarbrücken U	252	156.4	37.8	41.2	413.2
Regensburg U	264	151.5	31.0	10.8	414.7
Münster U	494	148.9	45.8	17.9	386.8
Cologne U	489	144.5	70.1	22.5	378.4
Frankfurt/Main U	475	140.0	29.1	33.1	388.7
Giessen U	361	139.4	42.0	25.3	333.9
Hohenheim U	117	137.9	49.3	20.0	522.1
Jena U	341	137.5	53.7	14.7	325.9
Average value[3]	**255**	**151.1**	**60.4**	**26.6**	**435.2**
Based on: N HEIs	**356**	**139**	**179**	**96**	**235**

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 to 40	41 to 60	61 and other

Abbreviations:

FU = Free University; HEI = Higher education institution; HU = Humboldt University; MedH = Medical School; TU/TH = University of Technology; U = University

[1] The ranking considers the 40 higher education institutions with the highest DFG funding volume in relation to the number of professors employed full time (full-time equivalents, rounded off). Only higher education institutions with 20 or more full-time equivalent professors in 2003 were considered.

[2] Please note that the figures listed here can only be compared to some extent. For example, DFG awards span several years, federal and EU funding refer to the amounts listed, and the „third-party funding in total" figures submitted by higher education institutions refer to a specific year. In addition, different reporting periods were used (cf. sources).

[3] Calculations are based on the 84 higher education institutions included in this report (HEIs with a DFG funding volume of half a million euros or more between 2002 and 2004). A total of 21,389 professors (full-time equivalents) were employed at these HEIs in 2003.

Table 5-2 (continued):
Summarised comparison of indicators for the 40 higher education institutions with the highest DFG funding volumes in relative terms

Higher education institution[1]	Scientific expertise and top-level researchers			International appeal		DFG cooperative research programmes	
	DFG Leibniz prizewinners	DFG review board members	DFG reviewers	AvH visiting researchers	DAAD researchers	Collaborations	Partner institutions
	N per 100 prof.	N per 100 prof.	N per 100 prof.	N per 100 prof.	N per 100 prof.	N per 100 prof.	N per 100 prof.
Karlsruhe TH	1.2	1.6	61.1	31.2	29.5	14.2	15.0
Hannover MedH	0.0	2.9	63.7	0.0	7.8	19.6	37.2
Aachen TH	1.5	4.4	49.7	21.5	23.3	10.0	9.0
Stuttgart U	1.6	3.1	54.7	35.8	25.6	17.3	22.8
Constance U	3.3	3.3	56.4	35.4	23.6	13.8	22.9
Würzburg U	1.9	3.3	48.7	18.5	14.7	12.0	16.1
Tübingen U	2.2	4.7	68.4	30.6	24.3	12.3	16.1
Heidelberg U	2.7	2.4	61.2	37.7	24.0	13.9	13.7
Freiburg U	2.5	5.8	66.2	27.1	22.1	7.8	8.6
Munich TU	1.7	2.9	60.5	41.9	11.0	15.6	17.8
Ulm U	1.1	2.6	55.9	32.7	14.2	7.9	15.8
Erlangen-Nuremberg U	0.4	3.0	50.2	23.7	13.1	8.5	11.7
Darmstadt TU	0.7	4.5	44.9	28.8	21.3	13.1	21.0
Göttingen U	1.7	3.3	51.7	27.9	25.3	8.7	11.1
Bochum U	1.3	3.2	51.4	24.1	22.5	12.1	9.9
Lübeck U	0.0	4.2	50.7	0.0	1.4	12.5	15.3
Brunswick TU	0.8	4.2	43.9	10.5	13.9	6.8	12.7
Berlin TU	1.5	2.7	42.9	26.4	23.4	14.9	19.5
Munich U	1.7	1.7	44.8	28.6	15.6	8.8	8.6
Bremen U	0.3	0.9	23.6	5.9	15.4	3.8	8.0
Berlin FU	2.1	3.0	43.8	32.5	33.6	12.3	16.6
Berlin HU	0.5	4.6	38.3	29.1	33.0	15.4	15.8
Hannover U	0.3	3.0	32.6	12.1	25.8	7.7	9.8
Clausthal TU	0.0	1.3	53.9	21.1	23.7	10.5	17.1
Düsseldorf U	1.1	1.4	44.4	11.2	13.7	7.6	12.6
Bonn U	1.5	2.5	52.5	27.9	15.5	8.6	9.7
Mainz U	0.7	2.2	40.6	14.5	9.0	8.0	9.0
Bayreuth U	1.6	3.8	43.9	38.9	26.3	4.9	12.6
Bielefeld U	2.5	1.6	35.9	22.5	14.7	11.0	17.6
Dortmund U	0.0	1.8	32.5	8.8	8.8	9.2	11.0
Kaiserslautern TU	0.0	3.1	44.0	20.8	13.5	6.7	6.1
Chemnitz TU	0.0	3.9	28.9	8.4	13.5	7.7	5.1
Saarbrücken U	2.8	1.2	44.5	15.5	11.9	8.7	11.9
Regensburg U	0.8	1.5	43.2	19.7	6.8	8.0	11.4
Münster U	1.2	3.2	40.9	17.0	11.9	4.9	5.9
Cologne U	1.2	2.7	40.1	22.5	11.7	6.1	9.8
Frankfurt/Main U	1.7	1.3	36.7	21.9	13.5	7.8	7.8
Giessen U	0.0	2.5	36.2	14.9	22.4	9.1	14.1
Hohenheim U	0.9	2.6	39.4	18.8	54.8	8.6	24.0
Jena U	0.3	2.3	34.4	9.4	11.7	6.5	11.7
Average value[3]	**1.0**	**2.4**	**36.7**	**17.0**	**16.1**	–	–
Based on: N HEIs	**51**	**71**	**124**	**68**	**151**	**86**	

Legend: Ranking group

1 to 10	11 to 20	21 to 30	31 to 40	41 to 60	61 and other

Sources:

Deutsche Forschungsgemeinschaft (DFG): Awards, participation in cooperative research programmes (Collaborative Research Centres and respective programme variations, Research Units, Research Training Groups and Research Centres) and DFG reviewers (written procedure) (2002 to 2004), Leibniz prizewinners (1986 to 2005) and DFG review board members (2004 to 2007) by higher education institution.

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution (based on: PROFI project database; 2002 to 2004).

EU Office of the BMBF: German participation in FP6 by higher education institution (as of 24 January 2006).

Federal Statistical Office: Third-party funding income in total (2001 to 2003) and professors (full-time equivalents; 2003) by higher education institution.

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution (2000 to 2004).

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution (2002 to 2004).

Calculated by the DFG

> However, the connection to the per capita statistics for DAAD-funded visiting researchers is less distinct. In this case only the TH Karlsruhe also has a leading position among DAAD visiting researchers. In a general comparison, the figures for DAAD-funded foreign visiting researchers have the lowest level of correlation to the other indicators mentioned here.

In most cases, the 40 highest ranked HEIs in relation to DFG funding volumes per professor correlate with the institutions that appear in the top ten for the other indicators. One of the exceptions occurs in the relative ranking of the direct R&D project funding by the federal government, which includes three smaller technical universities: the **TU Freiberg**, the **TU Hamburg-Harburg** and the **TU Cottbus**. In the context of the exclusivity of the Leibniz Programme — on average, an HEI wins one prize in 20 years for every 100 professors — the TU Freiberg, with two prizewinners, could be known, from a statistical standpoint, as a "Leibniz University". In the relative ranking of institutions by the number of elected review board members they employ, the **Veterinary University of Hannover**, the **University of Mannheim** and the **University of Magdeburg** all have places in the top ranking group. The picture is completed by the **universities** in **Kassel** and **Ilmenau**, which are in the top ten of the relative ranking for DAAD-funded foreign visiting researchers.

5.3 Summary of the General Findings

The rankings and other analyses developed for this report are based on a diverse selection of indicators, whose common characteristic is the emphasis on the funding activities of German and international funding bodies. It has been shown how these sources enable the illumination of the most varied aspects of research behaviour at higher education institutions and, in some cases, at non-university research institutions, in statistically quantified and in qualitatively elaborated form.

Following the presentation in chapter 4 and in section 5.2 of specific findings relating to the positions of HEIs in the overall rankings and in the rankings associated with various research and funding areas, some general findings derived from the analysis of the indicators are given here.

Subject-related Third-party Funding Requirements

The general significance of third-party funding has already been mentioned above. As explained in chapter 2, it can **vary in importance from one subject to the next**. In a comparison of the 14 research areas taken into account in the 2006 Funding Ranking, the largest total amount, €2.6 billion in three years, went to medicine. A total income amounting to €1.2 billion was recorded for the scientists and academics working in the research area "mechanical engineering, process engineering and materials science". HEIs received €440 million for research in the humanities, while €695 million was received in the area of social and behavioural sciences.

The varying importance of third-party funding becomes more obvious when these figures are related to the number of professors working in these research areas. The average amount of third-party funding awarded in three years to a single professor equals €1.1 million in mechanical engineering, €478,000 in chemistry, €145,000 in the social and behavioural sciences and €107,000 in the humanities (cf. Table 2-5 in chapter 2).

Such differences are also apparent from DFG funding awards — with significant disparity between subjects in some cases (cf. Table 2-7 in chapter 2).

Differences in the relative volume of third-party funding cannot be equated with differences in the research activities of the scientists and academics in the respective research areas. Rather, they indicate that third-party funding income is most effective as a standard of measure for comparisons within a particular subject. Income from third-party funding is being used at a growing number of HEIs to regulate the internal distribution of funds as part of a system of **performance-related funding allocation (PRF)**. However, they often do not take into account the fact that, relatively speaking, one euro of third-party funding may have a much greater value in one subject area than

another. With the base data for different research areas provided in this ranking, it is now possible to apply the appropriate weightings. The "third-party funding success" of an institution need no longer be estimated from a comparison of the different faculties of the same institution. A much better standard is provided by the nationwide average income in the relevant research area.

With the extension to a total of five indicators of third-party funding, the current ranking makes it possible, for the first time, to give a very broad basis to research and funding area-related statements about the third-party funding activities of HEIs. What is more, the various sources also enable a consideration of different dimensions of third-party funded research.

The volume of third-party funding that an institution receives from the DFG is thus primarily an indication of its third-party funded activity in the area of basic research. Other funding bodies have a stronger focus on applications or the immediate commercial utilisation of research.

Different orientations are reflected in the organisational form of the funding recipients. Whereas for many years DFG funding has gone primarily to HEIs, with a stable share of 89%, industrial research institutes and commercial businesses also participate significantly in the programmes of the EU, the AiF and the German government (from 41% to 52%).

On the other hand, there are disparities in the coverage given to different fields of research. While the DFG, according to its statutes, "serves all branches of science and the humanities", the EU and the federal government concentrate more on medical and technical fields (including biotechnology), as well as on selected natural science-related fields of research, and therefore give less coverage to topics that are treated by the humanities or the social and behavioural sciences.

Finally, the explicit goal of the AiF is to promote projects that are expected to provide results in the development and application of modern technology, and to benefit small- and medium-sized firms.

These different emphases play an important role in the interpretation of the figures presented in the 2006 Funding Ranking.

Inclusion of the data provided by the Federal Statistical Office concerning the total income of HEIs from third-party funding brings the added advantage that these figures also take into account funding that commercial business has invested in research at HEIs (accounting for up to 27% of the total). A comparison of these figures with those for DFG funding, which accounts for 31% of the total according to the federal statistics, allows differentiated conclusions to be drawn regarding the orientation of HEIs toward basic research (DFG) or toward applied research (general third-party funding income).

Indicators of Scientific Expertise and Excellence

The funding behaviour of larger funding bodies is not limited to the allocation of third-party funding. As the DFG figures show, they also engage in other activities from which it is possible to derive further conclusions regarding the research performance of HEIs and other research institutions. One such activity is the process of reviewing and evaluating proposals.

DFG data concerning both of these aspects were available for this report — reviews by almost 11,000 researchers in three years and evaluations by 577 review board members elected for the period from 2004 to 2007. In this context, it is possible to make the following points:

- Compared to the previous ranking, there has been a significant increase in the number of DFG reviewers working abroad (8% from 1999 to 2001, and 13% from 2002 to 2004).
- In relation to those based in Germany, the majority of scientist and academics in both groups, 84% of reviewers and 88% of review board members, were working at HEIs. In both cases, the Max Planck Society and the Helmholtz Association follow with substantial shares: 4% each and 3% each, respectively.
- The number of reviewers and review board members employed at an institu-

tion generally corresponds quite closely with its level of third-party funding income, and also with the other indicators of research activity used here.

The crucial contribution made by both groups to the research activities of the DFG cannot be overestimated. The number of elected review board members from German HEIs and non-university research institutions is presented here for the first time and, as in the 2003 report, this figure is also given for reviewers consulted in the written review process. This is also done as a mark of appreciation: the HEIs that achieve prominence in terms of this indicator thereby receive recognition for a valuable research-relevant activity undertaken by their scientists and academics, which would otherwise remain "invisible" in the sense that it is neither reflected in the institution's budget nor in the internationally perceptible form of scientific publications.

The DFG's Gottfried Wilhelm Leibniz Prize has been awarded since 1986, and up to 2005 a total of 250 prominent scientists and academics have been honoured with the prize:

- The prize is open to scientists and academics from all subject areas; however, an above-average number of the prizewinners come from subjects related to biology and the natural sciences. Humanities scholars and engineering scientists are represented by an average number of winners, and a comparably smaller number of prizes go to medical scientists.
- In addition to HEIs, a good proportion of prizewinners came from Max Planck institutes (12%).
- Among the Leibniz prizewinners from higher education institutions, 89% were working at one of the 40 HEIs with the highest DFG funding at the time they were awarded the prize.

Indicators for the International Appeal of Research

Statements about the international appeal of German research institutions are based on figures for international visiting researchers funded by the Alexander von Humboldt Foundation (AvH) and the German Academic Exchange Service (DAAD). The following may be stated in this regard:

- The countries of origin of these visiting researchers are predominantly China, India, the Russian Federation, the USA and Japan. In the sub-group of AvH prizewinners, however, scientists and academics from the USA play a decisive role, with 45% of all prizewinners, followed by the Russian Federation with 11%. This ranking corresponds closely to that of the 2003 report, as does the ranking for the DAAD, which primarily enabled scientists and academics from the Russian Federation, China, Turkey, India and Brazil to conduct research stays in Germany.
- An above-average proportion of the scientists and academics funded by both of these organisations can be assigned to subjects in the humanities (18% of all AvH-funded and 27% of all DAAD-funded visiting researchers). Furthermore, chemistry and physics are well represented at the AvH, which demonstrates the broad recognition given by the international scientific community to German research in these two research areas. No corresponding emphases can be discerned among DAAD-funded visiting researchers. Considering the comparably large proportion of DAAD scientists and academics in the research area "veterinary medicine, agriculture and forestry", it may be said that research priorities influenced by development policy have an important role to play here.
- In 16% of the cases, AvH funding recipients choose to conduct their research at a non-university research institution, and they primarily choose the institutes of the Max Plank Society (10%) and of the Helmholtz Association (4%). There are no records for DAAD funding recipients visiting non-university research institutions.

Studies of the internationality of research are generally based on analyses of publication history, and focus in particular on the question of how frequently articles in international journals are jointly published with co-authors from abroad. For many "hard science" subjects this is quite a solid measure, but this certainly does

not apply to the humanities, and it only has limited applicability to the engineering sciences. However, the number of AvH- or DAAD-funded visiting researchers that choose a particular university as the destination of their long-term research stay can be used as an indicator for cooperation and opens further perspectives. The research institution chosen by visiting researchers allows a special type of evaluation. It shows which German HEIs have achieved such a high level of international recognition that leading researchers from abroad are willing to invest the considerable time and effort required to travel to Germany for several weeks or months in order to cooperate with colleagues there.

The connection is quite clear: a pronounced international reputation is based on an equivalent strength in the respective research areas. If the humanities enjoy the highest recognition among AvH- and DAAD-funded visiting researchers, this is evidence for the often repeated assumption that the humanities have an important role in Germany with regard to their international standing.

Research Profiles of the 40 HEIs with the Highest DFG Funding

The analyses presented in chapter 3 of the research and funding area-specific profiles of HEIs have led to a number of revealing findings with regard to the thematic priorities that are financed by third-party funding. With the aid of a visualisation process developed especially for this ranking at the Max Planck Institute for the Study of Societies in Cologne, and using data relating to research funding by the DFG, the EU and the German government, it was possible to identify and illustrate specific research profiles for the 40 HEIs that received the highest amount of DFG funding. Profile analyses of regions were also carried out and presented in cartographic form, in this case using the total amount of DFG and federal funding received by the research institutions located in these regions.

The chief purpose of the profile analyses is to determine the similarities and differences between higher education institutions with regard to their thematic and funding area-specific orientations. This enables comparisons between HEIs, for example, in relation to their total third-party funding income, to be given an adequate basis. There is no longer a need for the type of sweeping generalisation that compares one institution to other institutions with completely different priorities. Instead, HEIs with similar research profiles can be used to benchmark.

So what are the rough similarities that can be used for an initial classification of institutions into particular groups?

- In relation to DFG funding, the visualisation shows a distinct division of institutions between the predominantly technical and the predominantly life sciences-oriented HEIs. In addition, a block of institutions can be identified that focus mainly on research in the humanities, and to a certain extent on social and behavioural sciences. Natural sciences, in particular physics and mathematics, belong, as typical basic research subjects, to the standard portfolio of most HEIs and therefore cannot be assigned to one block or the other.
- A comparison with the figures for participation in specific federal funding programmes mostly confirms the profiles ascertained from DFG figures. The funding priorities of the federal government also allow the recognition of groups of institutions that focus either on technical funding areas (such as energy research, aeronautical and space research or information technology) or on the areas of biotechnology or R&D in the health sector. As seen with the DFG, natural sciences-oriented funding areas are pursued by both of these groups.
- Preliminary data concerning participation in the Sixth EU Framework Programme give a very similar picture to that just described.

In addition to this rough classification, which enables the identification of the fields of research in which HEIs are active, detailed examination reveals that many institutions have their own individual emphases. For this reason it is possible to differentiate between technical universities on the basis of whether their second thematic focus lies in the natural sciences or in the life sciences. In the case of the life sciences, there are HEIs that carry out a substantial amount of research in both biology and medicine, and there are

those that concentrate solely or mainly on essentially medical research.

On the basis of these different emphases, various conclusions may be drawn with regard to the basic conditions for research that exist within, or on the borders of, research areas. In addition to the rough classification of HEIs just described, this is another possibility opened up by the profile analyses presented in chapter 3. It is especially useful when one compares the funding profiles based on DFG awards with the figures for participation in the specific, thematically defined programmes funded by the EU and the German government. It is precisely this type of comparison, only a few examples of which are given in this report, that clarifies what thematic constellations are used by certain research fields.

Keeping these profile analyses in mind, a consideration, for example, of the HEIs in the DFG funding ranking reveals that success in this ranking has been achieved most frequently by those institutions that prioritise the life sciences or the engineering sciences. Both of these fields feature an above-average requirement for third-party funding, and not only from the DFG. HEIs with the appropriate subject profile are therefore at an advantage in the competition for funding over those that have a different set of priorities.

This fact deserves special consideration in the evaluation of overall ranking differences, and also in an international comparison: **A place in the top group of an HEI ranking (including international rankings) is "only" a result. The interesting question is under what initial conditions the rank was achieved.** These conditions look quite different for those institutions whose research profile is dominated by subjects requiring intensive third-party funding, as compared to those institutions with a different mixture of subjects. The profile analyses undertaken for the first time in the 2006 Funding Ranking have given special attention to this aspect. They enable a more differentiated account that focuses less on overall "top positions" and support instead the comparison of institutions with similar profiles.

Individual Research and Funding Area-related Analyses

While the profile analyses described above offer a first glimpse of the total profile of selected HEIs, the individual findings, presented in chapter 4, concerning 14 research areas, 11 federal funding areas, 7 EU funding areas and funding by the German Federation of Industrial Research Associations (AiF) present a detailed overview of the leading institutions in each of these fields.

For each of the DFG's 14 research areas, the various rankings are arranged in the form of an indicator comparison. The bases of these rankings are formed by two indicators of third-party funding (total third-party funding income according to a survey by the Federal Statistical Office, and DFG awards based on internal DFG data), one indicator of scientific expertise (number of DFG reviewers), two indicators of international appeal (number of AvH- and DAAD-funded visiting researchers) and two indicators of networking (number of participations in DFG-funded cooperation programmes and number of institutions cooperated with). In each case, the 20 HEIs with the highest funding volumes in a particular area are shown.

> A comparison of these indicators generally points to a broad agreement of the results, and the leading group of HEIs in a research area most often have prominent positions for most of the indicators: HEIs that receive substantial funds in a research area are normally also attractive destinations for international visiting researchers. They are home to many of the experts in the relevant research area and are therefore in a position to provide many DFG reviewers. Finally, they frequently participate in the DFG's coordinated programmes and, in doing so, they work together with colleagues from numerous other institutions.

> For readers familiar with the system of research indicators, a finding that concerns the humanities may come as a surprise. Although it is commonly believed that research performance in this area is not accessible to quantitative analysis, or even that it is not measurable at all, a high level of cor-

relation was found between the indicators used here. On the other hand, the results for typical hard science subjects — primarily for physics — were in some cases quite discordant.

An explanation for this last point may be provided by the particular methodology employed in this ranking: analyses do not refer to selected institutes or faculties of an HEI but to all of the research in a subject area carried out at an HEI. Visiting researchers are allocated to physics, to stay with the previous example, because they have the appropriate training, but they do not necessarily visit the physics department of an institution. DFG funding is assigned to the research area of physics because the relevant project addresses essentially physics-related research questions — even if the scientist that submitted the proposal is currently working in an engineering sciences area.

Much more than in the field of teaching, it is difficult to assess research performance in a thematically centralised way, as research thrives on the interaction between subjects and disciplines. In this case the best that can be done is the determination of a thematic "core". The subjects arranged around this core are very different from one institution to the next, producing multifarious forms of interdisciplinary cooperation. This results in measurement problems, particularly in the basic natural science subjects, and it is therefore primarily these basic research subjects that elude the all-too narrow gaze of subject-centred analyses. There is so much overlapping between some areas that a sharp demarcation appears to be almost impossible. This is particularly obvious in the case of the life sciences, because in basic biomedical research, the areas of biology and medicine can hardly be distinguished.

Therefore, the figures relating to the leading HEIs in the funding areas of the EU, the German government and the AiF represent an important supplement, as they encourage one to avoid the overnarrow consideration of individual disciplines and to focus instead on special configurations that characterise the research at different locations.

For this reason, it may be especially useful in future analyses to emphasise the question of "networks": which subjects have the most wide-spread cooperative links with various other disciplines; where are the new frontiers, in which researchers from different backgrounds can interact in interdisciplinary projects?

The example of physics shows once more that differences in the rankings based on DFG funding or general third-party funding income are also the result of some HEIs being more strongly focused on the DFG than others that participate instead in the physics-related projects of the EU or the German government — and in some cases receive very substantial sums for large, individual projects (such as research with large-scale equipment). Funding bodies sometimes work here in a complementary manner — which points once more to the necessity, in any consideration of individual HEIs, of taking equally into account all of the indicators used in the 2006 Funding Ranking.

Research Regions and Institutional Cooperation in DFG-funded Coordinated Programmes

Analyses of participation in selected DFG coordinated programmes are used here to enable statements to be made in regard to the regionally defined cooperation of HEIs and non-university institutions (chapter 4). In comparison with the cartographic analyses of the regional distribution of funding from the DFG and the German government presented in the third chapter, a variety of revealing reference points resulted from this analysis.

The basis of the analysis is provided by participation in selected DFG coordinated programmes: Collaborative Research Centres (including Cultural Studies Research Centres and Transfer Units) focus primarily on intra-institutional cooperation and on cooperation with local research institutions. Research Training Groups frequently integrate university teachers from neighbouring HEIs or non-university research institutions. An additional model of cooperation, involving the combination of researchers from different HEIs and non-university research institutions in mostly small trans-regional associations, is most commonly facilitated through Research Units.

The analyses clarify that the utilisation of the different DFG coordinated programmes varies widely from one research area to the next. Research Train-

ing Groups, for example, are not common in the engineering sciences (with the exception of computer science), yet they play a central role in the humanities and social sciences. Research Units tend to find favour in the life sciences and in physics, while Collaborative Research Centres are an important instrument of research in medicine, biology and industrial engineering.

These different patterns of use associated with the DFG's cooperative programmes are accompanied by different forms of inter-institutional cooperation.

> Biology and medicine, above all, have strong networking profiles, featuring many regional cooperation clusters and transregional cooperation between the colleagues in these clusters. Research areas such as thermal and process engineering, which are prioritised by a limited number of institutions only, tend to follow a model that brings together scientists from the different research area "centres" in DFG-funded coordinated programmes. Other areas have cooperation cultures in which collaboration takes place primarily at an intra-institutional level or in which external cooperation targets alternating partners (for example the geosciences, electrical engineering, computer science, system engineering and mathematics).

> The extent to which non-university research institutions are integrated into these DFG-funded networks varies widely from research area to research area. There are many non-university institutions in medicine and biology, mostly Max Planck institutes. The two large Helmholtz centres, the Max Delbrück Centre (MDC) in Berlin and the German Cancer Research Centre (DKFZ) in Heidelberg, also have an important role here. In industrial engineering too, there is also a high number of non-university research institutions, particularly Fraunhofer institutes, participating in DFG programmes.

The cooperation networks in biology and medicine are similar not only in terms of density and intensity, but also in terms of the integration of specific HEIs and non-university research institutions. The extent of overlap between these disciplines is evident once more from this perspective: in both cases, institutions with an emphasis on basic biomedical research are active. The cooperation networks supported by DFG-funded programmes therefore also confirm the conclusion above, which strongly suggests that the research areas of medicine and biology should not be considered individually, but compared.

Cooperation clusters are an expression of the way that the form of research markets varies from region to region. They find favourable conditions wherever a large number of non-university research institutions have been established over the course of time, partly in the form of spin-offs or "An-institutions", but especially in the form of member institutions of the larger research organisations. The results of these network analyses are consistent with the results presented in chapter 3 in cartographic form, which identify the "research regions" with the highest third-party funding, based on figures for DFG funding and the federal funding of R&D projects. Berlin and Munich appear here again with a range of institutions that participate in DFG programmes in the various research areas — whether in medicine and biology, or in the humanities and the social and behavioural sciences, or in physics. In the cartographic presentation in chapter 3, Berlin and Munich stand out as having received very substantial amounts of DFG and federal funding. Comparable networks are found in the regions around Heidelberg, Marburg/Giessen and Göttingen (primarily in biology and medicine), around Hannover/Brunswick (medicine and industrial engineering) and Aachen (industrial engineering, material science and engineering).

If one also considers the regional distribution of the direct funding of R&D projects by the German government, there is evidence of cooperative possibilities that go far beyond the narrow circle of HEIs and member institutions of the larger research institutions.

Cartographic analyses and DFG-funded cooperation networks complement each other. On the one hand, they show the research and funding area-specific priorities of individual regions, and on

the other, they show the extent to which these priorities influence cross-institutional cooperation in DFG-funded coordinated programmes.

5.4 Conclusions and Outlook

Along with the individual findings described up to now, the analyses presented in this report make one thing particularly clear: on the basis of the data relating to the funding activities of larger funding bodies, it is possible to make very useful in-depth statements regarding the research activities of higher education institutions and non-university research institutions. Funding data are much more practical than the purely monetary aspect of third-party funding statistics would lead one to expect. Here too, a large part of the data concern third-party funding, and the resulting information relates primarily to the success of scientists working at the individual institutions in acquiring research funding. However, the conclusions that can be drawn from these allocations are extremely differentiated.

The profile analyses, presented for the first time in the 2006 Funding Ranking, show how the research portfolios of 40 HEIs are impacted by funding from the DFG, the EU or the German government. They also represent an innovative contribution by the DFG to the discussion about the formation of HEIs' profiles. These analyses are of particular importance therefore in the context of the ranking, because they point out a new direction between two traditional ranking methods: Comparative studies at an international level, and in particular the above-mentioned "Shanghai Ranking", take institutions as a whole as the objects of their analyses, and questions of thematic emphasis are not considered relevant. The main criterion is the total "output", whether this refers to the number of articles in scientific journals, of citations or of Nobel Prize recipients produced by the institution. Whether the number of articles in international journals, for example, is an appropriate measure of the collective research output of a university's various faculties, is a question that is not addressed. There are also rankings that only reflect the situation in certain, very specific subjects. An example of this approach is the "CHE Ranking" by the Centre for University Development in Gütersloh. According to the policy of the CHE: "They [the rankings] are strongly subject-related. There is no cross-subject comparison of higher education institutions as a whole. This is a result of the insight that there is no such thing as a best university. Each institution has a specific profile with strengths and weaknesses in different subjects" (cf. Method of the CHE Ranking at www.che.de). Individual departments, or groups of institutions, focussing primarily on a particular subject are therefore the objects of the analyses.

The analyses presented in this ranking also do not attempt to identify the "best university". But they allow recognition of the fact that there are HEIs and regions in Germany that provide the "best conditions" for research. This is shown by the fact that some of the leading HEIs have achieved high rankings in many (though not all) research areas. The overall analyses presented in this chapter have also pointed out a relatively small number of HEIs that, in terms of all of the indicators used here, have achieved high positions in both the rankings based on absolute figures and the relative rankings based on the number of professors. These institutions have distinct research priorities and thereby acquire reputations as important places of research. This reputation proves attractive to scientists from Germany and abroad — the latter being indicated by the close links between third-party funded research activity and the number of AvH-funded visiting researchers.

The fact that there is a research-political element to the provision of those special conditions required for the establishment of the "best universities" is indicated by the tendency for high ranking HEIs to be located in different German states.

Apart from questions concerning the "best universities", the analyses presented in this report demonstrate above all the positions of these institutions in the competition for funding and international renown in the area of their thematic research priorities. As already shown in the case of small institutions, concentration on particular research fields is one of the factors that contributes to an individ-

ual, internationally recognised research profile.

The 2006 Funding Ranking incorporates indicators for third-party funded research activity, scientific excellence and expertise, international recognition as a location of top-level German research and inter-institutional cooperation in DFG-funded programmes. Overall, a comparison of these figures gives a well-founded impression of the specific strengths of the HEIs that have been considered here.

Indeed, in the case of some subjects, the limited extent to which these indicators can be compared was revealed — a situation caused by the fact that any consideration of research performance that is restricted to individual subjects is faced with some difficulties, and especially so in the case of basic research subjects. Research is generally determined by interdisciplinary relationships, the specific form of which can vary from one location to another. As the ranking has clarified this situation, the current report also contributes to the discussion of methodology.

The DFG intends to continue this form of comparative analysis of funding data, also because it considers this an important service to its member institutions. In the future there should be a more detailed examination of certain issues that only received basic consideration here, due to limited data availability: cooperation between business and science, for example, or the integration of German research institutions in international cooperation networks such as those funded by the Sixth EU Framework Programme. With regard to the growing interdisciplinarity of research, it was only possible to scratch the surface in this report, but it will be the central focus of a supplementary study, which has already begun and which looks at research in the subject of mechanical engineering.

The DFG will continue to use its special position as a central funding body for research at German higher education institutions in order to process the knowledge accumulated by it and other funding bodies and to ensure the further availability of quantitative and qualitative reports on funding and research — providing that this form of funding and research transparency continues to be required by the DFG member institutions and to be actively supported by the research institutions involved in this ranking report.

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7. Appendix

Notes

Personnel data, when they are calculated as proportions (e. g. full-time equivalents for personnel data of higher education institutions or research-area equivalents for DFG reviewers), totals, and percentages may be rounded to the nearest whole number.

Abbreviations used:

cum. %	= Cumulative percent
DSHS	= German Sport University
FernU	= Distance University
FhI	= Fraunhofer Institute
FHTW	= University of Applied Sciences
FU	= Free University
H	= University of Applied Sciences
HEI	= Higher Education Institution
HfG	= School of Design
HPhil	= University of Philosophy
HU	= Humboldt University
IU	= International University
K €	= Thousands of euros
KathU	= Catholic University
MedH	= Medical School
Mio. €	= Million of euros
MPI	= Max Planck Institute
N	= Number
prof.	= Professor
TiHo	= University of Veterinary Medicine
TU/TH	= University of Technology
U	= University
UdBW	= Federal Armed Forces University
UdK	= University of the Arts

Key for research and funding area abbreviations used in the report:

DFG research areas

HUM:	Humanities
SOC:	Social and behavioural sciences
BIO:	Biology
MED:	Medicine
AGR:	Veterinary medicine, agriculture and forestry
CHE:	Chemistry
PHY:	Physics
MAT:	Mathematics
GEO:	Geosciences
MIE:	Mechanical and industrial engineering
TPE:	Thermal and process engineering
MSE:	Material science and engineering
ELE:	Computer science, electrical and system engineering
CEA:	Construction engineering and architecture

Thematic funding areas for direct R&D project funding by the German government

BIO:	Biotechnology
MED:	R&D in the health sector
LEB:	Large-scale equipment for basic research
PCT:	Physical and chemical technologies
SDE:	Sustainable development
GEO:	Geosciences
ASR:	Aeronautical and space research
ENE:	Energy research and energy technology
MAT:	Materials research
INF:	Information technology
STM:	Structural engineering, transport and mobility

Thematic funding areas for R&D funding within the EU's Sixth Framework Programme

CGK:	Citizens and governance in a knowledge-based society
LGB:	Life sciences, genomics and biotechnology for health
FQS:	Food quality and safety
SGE:	Sustainable development, global change and ecosystems
ANS:	Aeronautics and space
NAN:	Nanotechnologies and nano-sciences, knowledge-based multifunctional materials and new production processes and devices
IST:	Information society technologies

Table A-1:
Directory of DFG scientific disciplines, review boards and subject areas (2006)

Scientific disciplines / review boards / subject areas	
Humanities and social sciences	
101	**Ancient cultures**
101-01	Prehistory
101-02	Classical philology
101-03	Ancient history
101-04	Classical archaeology
101-05	Egyptology and ancient near eastern studies
102	**History**
102-01	Medieval history
102-02	Early modern history
102-03	Modern and current history
102-04	History of science
103	**Fine arts studies**
103-01	Art history
103-02	Musicology
104	**Linguistics**
104-01	General and applied linguistics
104-02	Special linguistics
104-03	Typology, non-european languages, historical linguistics
105	**Literature, theatre and media studies**
105-01	Older german literature and lit medieval studies
105-02	Modern german literature
105-03	European and american literature
105-04	African and asian literatures
105-05	General literature and cultural studies
105-06	Media and theatre studies
105-07	European ethnology
106	**Ethnology, non-european cultures, religious studies**
106-01	Ethnology
106-02	Regional studies: Africa, America, Asia, Australia
106-03	Study of religion
106-04	Islamic studies, arabian studies, semitic studies
106-05	Jewish studies
107	**Theology**
107-01	Protestant theology
107-02	Roman catholic theology
108	**Philosophy**
108-01	History of philosophy
108-02	Theoretical philosophy
108-03	Practical philosophy
109	**Education sciences**
109-01	General education and historical perspectives
109-02	Teaching-learning process and qualification process
109-03	Socialization, institutions and professions
110	**Psychology**
110-01	General and physiological psychology, methodology
110-02	Developmental and educational psychology
110-03	Social psychology, industrial and organisational psychology
110-04	Clinical psychology, differential psychology and diagnostics

>> Continued on next page

Scientific disciplines / review boards / subject areas	
111	**Social sciences**
111-01	Sociological theory
111-02	Empirical social research
111-03	Communication science
111-04	Political science
112	**Economics**
112-01	Economic theory
112-02	Economic and social policy
112-03	Finance
112-04	Business administration
112-05	Statistics and econometrics
112-06	Economic and social history
113	**Jurisprudence**
113-01	Legal and political philosophy, legal history
113-02	Private law
113-03	Criminal law and law of criminal procedure
113-04	Criminology
Life sciences	
201	**Foundations of biology and medicine**
201-01	Biochemistry
201-02	Biophysics
201-03	Cell biology
201-04	Structural biology
201-05	General genetics
201-06	Developmental biology
201-07	Bioinformatics and theoretical biology
201-08	Nutritional sciences
201-09	Anatomy
201-10	Physiology
202	**Plant science**
202-01	Systematic botany and evolution
202-02	Ecology and ecosystem research
202-03	Allelobotany
202-04	Plant physiology
202-05	Plant biochemistry and biophysics
202-06	Plant cell and developmental biology
202-07	Plant genetics
203	**Zoology**
203-01	Special zoology, morphology
203-02	Evolution, biodiversity, physical anthropology
203-03	Comparative biochemistry, animal physiology and ecophysiology
203-04	Sensory and behavioural biology
203-05	Animal ecology and ecosystem research
203-06	Animal genetics, cell and developmental biology
204	**Microbiology, virology and immunology**
204-01	Metabolism, biochemistry and genetics of microorganisms
204-02	Microbial ecology and applied microbiology
204-03	Medical microbiology, molecular infection biology
204-04	Virology
204-05	Immunology
205	**Medicine**
205-01	Medical biometry, epidemiology, medical informatics
205-02	Occupational and social medicine
205-03	Human genetics

>> Continued on next page

Scientific disciplines / review boards / subject areas	
205-04	Pathology and forensic medicine
205-05	Clinical chemistry and pathobiochemistry
205-06	Pharmacy
205-07	Pharmacology and toxicology
205-08	Anaesthesiology
205-09	Internal medicine — cardiology
205-10	Internal medicine — angiology
205-11	Internal medicine — pneumology
205-12	Internal medicine — hematology, oncology
205-13	Internal medicine — gastroenterology, metabolism
205-14	Internal medicine — nephrology
205-15	Internal medicine — endocrinology
205-16	Internal medicine — rheumatology
205-17	Pediatrics
205-18	Gynaecology and obstetrics
205-19	Dermatology
205-20	Urology
205-21	Vascular and visceral surgery
205-22	Cardiothoracic surgery
205-23	Orthopaedics, traumatology
205-24	Dentistry, oral surgery
205-25	Radiology, nuclear medicine, radiotherapy
205-26	Biomedical technology and medical physics
206	**Neurosciences**
206-01	Molecular neuroscience
206-02	Cellular neuroscience
206-03	Developmental neurobiology
206-04	Systemic neuroscience
206-05	Comparative neurobiology and comparative sensory physiology
206-06	Neuroethology and cognitive neuroscience
206-07	Neurogenetics and psychiatric genetics
206-08	Clinical neurosciences I — neurology, neurosurgery
206-09	Clinical neurosciences II — psychiatry, psychotherapy
206-10	Clinical neurosciences III — ophthalmology
206-11	Clinical neurosciences IV — otolaryngology
206-12	Neuroimaging
207	**Agriculture, forestry, horticulture and veterinary medicine**
207-01	Soil sciences
207-02	Plant cultivation
207-03	Plant nutrition
207-04	Ecology of agricultural landscapes
207-05	Plant breeding
207-06	Phytomedicine
207-07	Agricultural and food process engineering
207-08	Agricultural economics and sociology
207-09	Inventory control and use of forest resources
207-10	Basic forest research
207-11	Animal breeding, maintenance and hygiene
207-12	Animal nutrition and nutrition physiology
207-13	Foundations of veterinary medicine
207-14	Foundations of pathogenesis, diagnostics, therapy
207-15	Clinical veterinary medicine
Natural sciences	
301	**Molecular chemistry**
301-01	Inorganic molecular chemistry
301-02	Organic molecular chemistry

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Scientific disciplines / review boards / subject areas	
302	**Chemical solid state research**
302-01	Solid state and surface chemistry, material synthesis
302-02	Physical chemistry of solids and solid surfaces
302-03	Theory and modelling
303	**Physical chemistry of molecules, liquids and interfaces, general theoretical chemistry**
303-01	Physical chemistry of molecules and liquids
303-02	Theory and modelling, general theoretical chemistry
304	**Analytical chemistry, method development**
304-01	Analytical chemistry, method development
305	**Chemistry of biological systems**
305-01	Bioorganic, bioinorganic and biophysical chemistry
305-02	Food chemistry
306	**Polymer research**
306-01	Polymer chemistry
306-02	Polymer physics
306-03	Polymer materials
307	**Condensed matter physics**
307-01	Condensed matter physics
308	**Optics, quantum optics, atoms, molecules, plasmas**
308-01	Optics, quantum optics, atoms, molecules, plasmas
309	**Particles, nuclei and fields**
309-01	Particles, nuclei and fields
310	**Statistical physics and nonlinear dynamics**
310-01	Statistical physics and nonlinear dynamics
311	**Astrophysics and astronomy**
311-01	Astrophysics and astronomy
312	**Mathematics**
312-01	Mathematics
313	**Atmospheric science and oceanography**
313-01	Atmospheric science and oceanography
314	**Geology and palaeontology**
314-01	Geology and palaeontology
315	**Geophysics and geodesy**
315-01	Geophysics, geodesy, remote sensing, geoinformatics
316	**Geochemistry, mineralogy and crystallography**
316-01	Geochemistry, mineralogy and crystallography
317	**Geography**
317-01	Human and physical geography
318	**Water research**
318-01	Water research
Engineering sciences	
401	**Production technology**
401-01	Metal-cutting manufacturing engineering

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Scientific disciplines / review boards / subject areas	
401-02	Primary shaping and reshaping technology
401-03	Micro-, precision, mounting, joining, separation technology
401-04	Plastics engineering
401-05	Production automation, factory operation, operations management
402	**Mechanics and constructive mechanical engineering**
402-01	Construction, machine elements
402-02	Mechanics
402-03	Lightweight construction, textile technology
403	**Process engineering, technical chemistry**
403-01	Chemical and thermal process engineering
403-02	Technical chemistry
403-03	Mechanical process engineering
403-04	Biological process engineering
404	**Heat energy technology, thermal machines and drives**
404-01	Energy process engineering
404-02	Technical thermodynamics
404-03	Fluid mechanics
404-04	Hydraulic and turbo engines and piston engines
405	**Materials engineering**
405-01	Structural and functional materials
405-02	Sintered and composite materials
405-03	Surfaces, coatings and functional layers
406	**Materials science, raw materials**
406-01	Raw materials, recycling, mining and metallurgy
406-02	Metallic, ceramic and polymer materials
406-03	Metallurgy, thermodynamics of multiphase metallic systems
406-04	Biomaterials
407	**System engineering**
407-01	Automation technology, robotics
407-02	Measuring technology, sensorics, actorics
407-03	Microsystem engineering
407-04	Traffic and transport systems, logistics
407-05	Ergonomics, human-machine systems
408	**Electrical engineering**
408-01	Electronic semiconductors, components, circuits, systems
408-02	Communication and high-frequency technology
408-03	Electrical energy production, distribution, application
409	**Computer science**
409-01	Theoretical computer science
409-02	Software technology
409-03	Operating, communication and information systems
409-04	Artificial intelligence, image and language processing
409-05	Computer architecture and embedded systems
410	**Construction engineering and architecture**
410-01	Architecture, construction research and history
410-02	City, regional, traffic and landscape planning
410-03	Construction material sciences, chemistry, physics
410-04	Construction engineering, operation, virtual design
410-05	Continuum mechanics, statics and dynamics
410-06	Geotechnics, hydraulic engineering

Table A-2:
Schematic overview of direct R&D project funding categories derived from the system used by the German government

Funding field	Funding priority		Funding area
Biotechnology	K0	Biotechnology	Biotechnology
R&D in the health sector	G0	R&D in the health sector	R&D in the health sector
Large-scale equipment for basic research	B0	Large-scale equipment for basic research	Large-scale equipment for basic research
Materials research: physical and chemical technologies	L2	Physical and chemical technologies	Physical and chemical technologies
Sustainable development	F1	Socio-ecological research; regional sustainability	Sustainable development
	F2	Sustainable Production; cleaner enviromental technology	
	F7	Global change (including peace-building research)	
Marine and polar research; marine technology	C1	Marine and polar research	Geosciences
	C2	Marine technology	
Geosciences and raw material supplies	O1	Geosciences (especially deep drillings)	
Space research and space technology	D1	National Funding of space research and space technology	Aeronautical and space research
Aeronautical research and hypersonic technology	M0	Aeronautical research and hypersonic technology	
Energy research and energy technology	E1	Coal and other fossil fuels	Energy research and energy technology
	E2	Renewable energy and energy conservation	
	E3	Nuclear energy research (excluding decommissioning of nuclear facilities)	
	E4	Decommissioning of nuclear facilities; risk sharing	
Materials research; physical and chemical technologies	L1	Materials research; materials for emerging technologies	Materials research
Information technology (including multimedia and production engineering)	I1	Computer science	Information technology
	I2	Basic information technologies	
	I3	Application of microsystems (including application of microelectronics; microperipherals)	
	I4	Production engineering	
	I5	Multimedia	
Research and technology for mobility and transport (including traffic safety)	N0	Research and technology for mobility and transport (including traffic safety)	Structural engineering, transport and mobility
Regional planning and urban development; building research	P2	Building research and technology; research and technology for preserving the architectural heritage; road building research	
R&D to improve working conditions	H0	R&D to improve working conditions	Further areas
Educational research	S1	Vocational training research	
	S2	Other educational research	
Innovation and improved basic conditions	T2	Improving the transfer of technology and knowledge	
Humanities; economics and social sciences	V0	Humanities; economics and social sciences	
Structural / innovative (generic) measures and other generic activities	W1	Structural / innovative (generic) measures	
	W2	Other generic activities	
Non R&D relevant education expenditures — non scientific expenditures	Y2	Non R&D relevant education expenditures — non scientific expenditures	

Table A-3:
Concordance of the classification systems used by the Federal Statistical Office for fields of teaching and research and by the DFG for scientific disciplines and research areas

T&R code	Field of teaching and research (T&R)	Research area	Scientific discipline
010	Linguistics and general cultural sciences	Humanities	Humanities and social sciences
020	Evangelical theology		
030	Catholic theology		
040	Philosophy		
050	History		
080	General and comparative literary and linguist. stud.		
090	Ancient philology (classical philology)		
100	Germanic studies (Ger., germanic lang. excl. Engl.)		
110	English, American studies		
120	Romance languages		
130	Slavonic stud., Baltic stud., Finno-Ugric stud.		
140	Other / non-Europ. linguistic and literary stud.		
160	Cultural sciences (in the strict sense)		
225	Regional science		
780	Art, general fine arts studies		
790	Fine arts studies		
800	Design		
820	Performing arts, film and television, theatr. stud.		
830	Music, musicology		
070	Library science, documentation, media stud.	Social and behavioural sciences	
170	Psychology		
180	Educational studies		
190	Special education		
200	Sport studies		
220	Law, economics and general humanities		
230	Political science		
235	Social sciences		
240	Social welfare		
250	Law		
270	Administrative studies		
290	Economics		
310	Economic engineering		
400	Biology	Biology	Life sciences
650	Dietetics and home economics		
390	Pharmacy	Medicine	
440	General human medicine		
450	Preclinical human medicine (incl. dentistry)		
470	Theo. clinical human medicine (incl. dentistry)		
490	Pract. clinical human medicine (excl. dentistry)		
520	Dentistry (clinical practical)		
970	Clinics overall, central services		
980	Clinics, social services		
986	Other clinical teaching units		
990	Institutions related to and not related to clinics		
540	Veterinary medicine	Veterinary medicine, agriculture and forestry	
550	Preclinical veterinary medicine		
560	Theoretical clinical veterinary medicine		
580	Practical clinical veterinary medicine		
610	Agriculture, forestry and dietetics		
615	Landscape and environmental architecture		
620	Agricultural sciences		
640	Forestry, timber trade		

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T&R code	Field of teaching and research (T&R)	research area	Scientific discipline
370	Chemistry	Chemistry	Natural sciences
360	Physics, astrophysics	Physics	
330	Mathematics, general natural sciences	Mathematics	
340	Mathematics		
410	Geosciences (excl. geography)	Geosciences	
420	Geography		
670	Engineering sciences	Mechanical and process engineering and materials science[1)]	Engineering sciences
680	Mining and metallurgy		
690	Mechanical engineering / process engineering		
720	Traffic technology, nautical science		
350	Computer science	Computer science, electrical and system engineering	
710	Electrical engineering		
730	Architecture	Construction engineering and architecture	
740	Regional development planning		
750	Civil engineering		
760	Surveying		
870	Universities in total		No classification possible
880	Central university administration		
890	Centrally administrated lecture rooms		
900	Central library		
910	University computing centres		
920	Central scientific services		
930	Central operating and supply services		
940	Social services		
950	Other educational institutions		
960	Institutions related to and not related to universities		

[1)] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, „mechancial and process engineering and materials science“.

Table A-4:
Full-time professors by higher education institution and DFG scientific discipline[1] (2003)

Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences	No classification possible
Aachen TH	391	61	78	96	155	1
Augsburg U	157	106		42	9	
Bamberg U	128	115		4	9	
Bayreuth U	182	81	15	67	19	
Berlin FHTW	203	109		5	89	
Berlin FU	529	262	154	100	11	3
Berlin HU	563	239	222	83	17	3
Berlin TU	329	88	19	85	134	4
Berlin UdK	173	159			14	
Bielefeld U	245	154	21	48	8	14
Bochum U	373	191	43	78	61	1
Bonn U	477	175	159	110	24	9
Bremen H	150	60	4		86	
Bremen IU	72	24	12	26	10	
Bremen U	339	164	20	73	43	39
Brunswick TU	237	60	27	57	90	3
Chemnitz TU	156	62		39	54	0.3
Clausthal TU	76	5		32	39	
Cologne DSHS	23	23				
Cologne U	489	271	124	93		1
Constance U	153	93	24	31	5	
Cottbus TU	120	12	1	19	88	
Darmstadt TU	267	59	15	88	105	
Dortmund U	283	114	5	67	92	5
Dresden TU	528	147	104	85	188	3
Duisburg-Essen U	520	234	80	103	96	7
Düsseldorf U	277	96	127	50	4	
Eichstätt-Ingolstadt KathU	114	101		11	2	
Erfurt U	83	81		1	1	
Erlangen-Nuremberg U	472	175	139	90	68	1
Frankfurt/Main U	475	250	128	89	8	
Frankfurt/Oder U	55	53		1		1
Freiberg TU	104	16	3	32	53	
Freiburg U	361	123	146	63	27	2
Giessen U	361	142	160	48	3	8
Göttingen U	423	154	176	86	5	2
Greifswald U	214	90	81	43		
Hagen FernU	76	48		8	20	
Halle-Wittenberg U	375	165	123	59	28	
Hamburg U	800	387	229	149	26	9
Hamburg UdBW	91	63		2	26	
Hamburg-Harburg TU	106	1		2	103	
Hannover MedH	102		100			3
Hannover TiHo	61		58	1		2
Hannover U	338	128	42	70	93	5
Heidelberg U	409	141	171	89	5	3
Hohenheim U	117	34	72	11		
Ilmenau TU	90	16		14	60	
Jena U	341	150	106	70	14	1
Kaiserslautern TU	164	14	13	52	85	
Karlsruhe HfG	18	16			2	
Karlsruhe TH	247	43	10	72	119	3
Kassel U	280	140	26	34	80	
Kiel U	381	135	122	59	28	37

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Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences	No classification possible
Koblenz-Landau U	127	92	4	18	12	1
Leipzig U	439	202	148	70	18	1
Lübeck U	72		58	2	10	2
Lüneburg U	190	110	4	12	63	1
Magdeburg U	214	65	62	24	64	
Mainz U	413	206	127	73	5	2
Mannheim U	118	93		11	14	
Marburg U	369	164	133	64	8	
Munich HPhil	10	10				
Munich TU	410	19	165	84	143	
Munich U	707	298	273	123	13	
Munich UdBW	150	41			94	15
Münster U	494	219	161	101	6	7
Oldenburg U	174	93	16	46	19	1
Osnabrück U	176	124	14	28	10	
Paderborn U	188	91	2	48	47	
Passau U	93	74		9	10	
Potsdam U	218	125	28	57	8	0.3
Regensburg U	264	126	82	54		2
Rostock U	285	86	92	47	60	
Saarbrücken U	252	96	75	43	38	
Siegen U	219	110	2	38	69	
Stuttgart U	254	47	10	60	134	3
Trier U	158	124		29	5	
Tübingen U	366	170	106	73	16	1
Ulm U	190	12	101	40	35	2
Weimar U	91	31		2	58	
Witten-Herdecke U	33	13	21			
Wuppertal U	256	108		61	87	
Würzburg U	368	127	157	75	9	
Report subtotal[2)]	**21,389**	**8,904**	**4,993**	**3,928**	**3,358**	**208**
Other HEIs	**16,027**	**7,693**	**640**	**880**	**6,662**	**152**
HEIs in total	**37,416**	**16,597**	**5,633**	**4,808**	**10,019**	**359**

[1)] Cf. Table A-3 for the classification system used in the report.

[2)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-5:
Full-time scientists and academics staff by higher education institution and DFG scientific discipline[1] (2003)

Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences	No classification possible
Aachen TH	3,686	242	1,145	480	1,728	91
Augsburg U	650	414	2	175	35	24
Bamberg U	387	301	1	15	46	25
Bayreuth U	803	275	75	316	115	21
Berlin FHTW	273	149		12	105	7
Berlin FU	2,874	920	1,319	500	55	80
Berlin HU	4,261	946	2,759	423	74	60
Berlin TU	1,959	352	79	437	1,030	61
Berlin UdK	329	292			32	5
Bielefeld U	1,206	524	133	207	71	270
Bochum U	2,259	797	347	514	528	74
Bonn U	2,774	570	1,349	561	149	145
Bremen H	205	89	4		107	4
Bremen IU	132	36	26	56	14	
Bremen U	1,661	429	88	345	356	442
Brunswick TU	1,422	187	163	235	807	29
Chemnitz TU	747	228		166	321	32
Clausthal TU	391	11		125	243	13
Cologne DSHS	194	193				1
Cologne U	2,882	972	1,358	454		98
Constance U	747	369	141	194	24	20
Cottbus TU	558	52	1	70	410	26
Darmstadt TU	1,604	202	66	466	844	26
Dortmund U	1,443	367	9	291	725	51
Dresden TU	3,580	537	1,191	371	1,391	91
Duisburg-Essen U	2,609	669	935	418	488	98
Düsseldorf U	1,937	321	1,371	200	19	25
Eichstätt-Ingolstadt KathU	292	254	1	28	7	2
Erfurt U	274	263		2	5	4
Erlangen-Nuremberg U	3,136	621	1,331	408	610	165
Frankfurt/Main U	2,628	812	1,296	424	37	60
Frankfurt/Oder U	177	161		3		13
Freiberg TU	539	50	17	155	303	15
Freiburg U	2,905	478	1,819	305	206	96
Giessen U	2,016	432	1,318	183	7	76
Göttingen U	2,605	542	1,620	402	5	36
Greifswald U	1,174	276	721	161		16
Hagen FernU	424	223		27	113	61
Halle-Wittenberg U	2,242	602	1,167	258	147	68
Hamburg U	3,124	925	1,437	568	116	78
Hamburg UdBW	299	176		7	111	5
Hamburg-Harburg TU	510	2		5	488	15
Hannover MedH	1,408		1,356			52
Hannover TiHo	268		260	3		5
Hannover U	1,912	408	182	313	829	180
Heidelberg U	3,087	538	1,997	454	14	83
Hohenheim U	620	123	379	49		69
Ilmenau TU	616	78		65	430	44
Jena U	2,154	540	1,162	383	57	12
Kaiserslautern TU	849	61	70	239	439	40
Karlsruhe HfG	31	24			4	4
Karlsruhe TH	2,067	234	66	477	1,184	106
Kassel U	967	358	100	119	325	66
Kiel U	2,271	404	1,249	271	138	209

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Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences	No classification possible
Koblenz-Landau U	341	233	12	36	42	18
Leipzig U	2,464	709	1,297	321	102	34
Lübeck U	925		852	9	57	7
Lüneburg U	410	225	10	28	80	66
Magdeburg U	1,588	291	703	120	473	
Mainz U	2,635	700	1,424	451	15	45
Mannheim U	594	394		30	74	97
Marburg U	1,982	491	1,175	255	30	33
Munich HPhil	19	19				
Munich TU	3,871	147	1,616	616	1,400	91
Munich U	4,883	1,161	3,000	622	76	24
Munich UdBW	443	113			309	22
Münster U	3,303	937	1,565	587	28	186
Oldenburg U	640	288	57	185	74	35
Osnabrück U	565	355	71	94	39	5
Paderborn U	892	262	6	184	380	60
Passau U	321	194		22	46	58
Potsdam U	979	498	114	276	36	56
Regensburg U	1,720	443	983	269		25
Rostock U	1,662	284	901	168	302	6
Saarbrücken U	1,828	435	902	222	219	49
Siegen U	677	269	3	125	247	33
Stuttgart U	2,475	215	64	348	1,588	260
Trier U	554	432		94	21	8
Tübingen U	2,886	607	1,747	364	100	67
Ulm U	1,728	38	1,219	193	224	53
Weimar U	402	91		11	289	11
Witten-Herdecke U	170	51	111	8		
Wuppertal U	776	260	1	206	273	36
Würzburg U	2,357	452	1,495	359	46	5
Report subtotal[2)]	**124,255**	**29,622**	**49,440**	**18,539**	**21,865**	**4,788**
Other HEIs	**22,772**	**11,951**	**843**	**1,190**	**8,232**	**556**
HEIs in total	**147,027**	**41,573**	**50,284**	**19,729**	**30,097**	**5,344**

[1)] Cf. Table A-3 for the classification system used in the report.

[2)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-6:
Current expenditure from 2001 to 2003 by higher education institution (in million euros)

Higher education institution	Current expenditure (total)	Administrative income		Third-party funding income		Current basic funds	
	Mio. €	Mio. €	% of total	Mio. €	% of total	Mio. €	% of total
Aachen TH	2,313.3	727.3	31.4	406.5	17.6	1,179.5	51.0
Augsburg U	212.3	6.1	2.9	29.9	14.1	176.4	83.1
Bamberg U	125.5	0.6	0.5	11.7	9.3	113.2	90.2
Bayreuth U	291.8	2.8	1 .0	64.3	22.0	224.7	77.0
Berlin FHTW	129.3	5.9	4.5	5.5	4.3	117.9	91.2
Berlin FU	1,724.7	614.4	35.6	231.3	13.4	879.0	51.0
Berlin HU	2,985.3	1,677.7	56.2	313.0	10.5	994.5	33.3
Berlin TU	943.5	21.5	2.3	213.7	22.7	708.3	75.1
Berlin UdK	139.3	3.3	2.4	7.1	5.1	128.8	92.5
Bielefeld U	471.1	4.3	0.9	92.5	19.6	374.3	79.5
Bochum U	964.7	5.0	0.5	180.6	18.7	779.0	80.8
Bonn U	2,222.1	1,052.6	47.4	213.4	9.6	956.1	43.0
Bremen H	91.9	6.2	6.7	13.9	15.1	71.8	78.1
Bremen IU	49.0	13.1	26.7	1.9	3.9	34.0	69.4
Bremen U	575.7	14.1	2.4	188.6	32.8	372.9	64.8
Brunswick TU	566.7	31.5	5.6	125.4	22.1	409.7	72.3
Chemnitz TU	274.5	2.4	0.9	58.8	21.4	213.3	77.7
Clausthal TU	193.1	16.8	8.7	49.7	25.7	126.6	65.6
Cologne DSHS	108.2	4.5	4.2	15.2	14.0	88.5	81.8
Cologne U	1,871.2	700.3	37.4	185.1	9.9	985.8	52.7
Constance U	297.8	5.2	1.7	65.6	22.0	227.0	76.2
Cottbus TU	202.8	3.7	1.8	47.9	23.6	151.2	74.6
Darmstadt TU	633.7	49.2	7.8	165.8	26.2	418.8	66.1
Dortmund U	566.9	7.0	1.2	104.1	18.4	455.7	80.4
Dresden TU	1,607.6	592.4	36.8	249.8	15.5	765.5	47.6
Duisburg-Essen U	1,828.3	785.4	43.0	180.5	9.9	862.4	47.2
Düsseldorf U	1,533.6	749.1	48.8	111.8	7.3	672.8	43.9
Eichstätt-Ingolstadt KathU	98.4	1.1	1.1	10.2	10.4	87.1	88.5
Erfurt U	98.7	1.3	1.3	7.9	8.0	89.5	90.7
Erlangen-Nuremberg U	1,727.7	771.4	44.6	239.2	13.8	717.1	41.5
Frankfurt/Main U	1,646.9	852.2	51.7	184.5	11.2	610.2	37.1
Frankfurt/Oder U	75.3	1.5	2.0	15.8	21.0	58.0	77.0
Freiberg TU	206.4	2.8	1.4	61.4	29.7	142.2	68.9
Freiburg U	1,861.7	935.2	50.2	230.8	12.4	695.7	37.4
Giessen U	1,408.0	716.6	50.9	120.7	8.6	570.7	40.5
Göttingen U	1,996.4	817.5	40.9	226.9	11.4	952.0	47.7
Greifswald U	648.2	385.5	59.5	44.1	6.8	218.6	33.7
Hagen FernU	232.3	41.7	17.9	29.9	12.9	160.7	69.2
Halle-Wittenberg U	1,225.3	610.8	49.8	103.9	8.5	510.7	41.7
Hamburg U	1,952.9	912.0	46.7	190.1	9.7	850.8	43.6
Hamburg UdBW	182.6	0.1	0.1	12.9	7.0	169.6	92.9
Hamburg-Harburg TU	208.6	1.2	0.6	44.8	21.5	162.6	77.9
Hannover MedH	1,471.1	904.8	61.5	113.0	7.7	453.2	30.8
Hannover TiHo	174.2	27.1	15.5	15.3	8.8	131.8	75.7
Hannover U	765.3	73.1	9.5	168.9	22.1	523.4	68.4
Heidelberg U	2,136.5	1,072.2	50.2	281.0	13.2	783.3	36.7
Hohenheim U	296.8	9.9	3.3	61.0	20.5	225.9	76.1
Ilmenau TU	212.4	13.6	6.4	40.5	19.1	158.4	74.5
Jena U	1,265.0	605.7	47.9	111.0	8.8	548.3	43.3
Kaiserslautern TU	308.1	7.8	2.5	84.9	27.5	215.4	69.9
Karlsruhe HfG	13.7	0.02	0.1	0.9	6.4	12.8	93.4
Karlsruhe TH	708.9	8.2	1.2	232.3	32.8	468.5	66.1
Kassel U	373.7	7.2	1.9	60.0	16.0	306.5	82.0
Kiel U	1,464.9	764.4	52.2	155.9	10.6	544.6	37.2
Koblenz-Landau U	135.2	1.2	0.9	13.7	10.1	120.3	88.9
Leipzig U	1,435.8	688.5	48.0	123.2	8.6	624.2	43.5

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Higher education institution	Current expenditure (total)	Administrative income		Third-party funding income		Current basic funds	
	Mio. €	Mio. €	% of total	Mio. €	% of total	Mio. €	% of total
Lübeck U	842.0	604.5	71.8	49.0	5.8	188.4	22.4
Lüneburg U	164.2	5.0	3.1	15.3	9.3	143.9	87.6
Magdeburg U	1,027.6	604.5	58.8	94.1	9.2	329.0	32.0
Mainz U	1,779.3	883.9	49.7	172.4	9.7	723.1	40.6
Mannheim U	220.7	3.4	1.5	33.0	15.0	184.3	83.5
Marburg U	1,197.1	618.7	51.7	104.1	8.7	474.3	39.6
Munich HPhil	6.5	0.7	10.2	1.3	20.1	4.5	69.7
Munich TU	1,917.6	589.3	30.7	409.4	21.3	919.0	47.9
Munich U	3,082.6	1,493.1	48.4	368.3	11.9	1,221.1	39.6
Munich UdBW	260.0	0.0	0.0	14.6	5.6	245.5	94.4
Münster U	2,159.9	900.7	41.7	191.0	8.8	1,068.2	49.5
Oldenburg U	337.3	15.6	4.6	52.0	15.4	269.7	80.0
Osnabrück U	261.0	6.0	2.3	29.7	11.4	225.3	86.3
Paderborn U	358.6	1.7	0.5	75.4	21.0	281.5	78.5
Passau U	118.1	1.1	1.0	12.1	10.3	104.8	88.8
Potsdam U	295.0	6.7	2.3	53.3	18.1	235.0	79.7
Regensburg U	987.7	457.1	46.3	109.5	11.1	421.1	42.6
Rostock U	942.0	510.0	54.1	73.7	7.8	358.4	38.0
Saarbrücken U	1,273.4	719.0	56.5	103.9	8.2	450.5	35.4
Siegen U	297.9	1.4	0.5	34.1	11.5	262.4	88.1
Stuttgart U	904.7	35.9	4.0	322.1	35.6	546.7	60.4
Trier U	220.3	3.5	1.6	40.1	18.2	176.6	80.2
Tübingen U	1,880.7	998.5	53.1	218.9	11.6	663.3	35.3
Ulm U	1,111.4	649.1	58.4	134.8	12.1	327.5	29.5
Weimar U	136.3	7.0	5.1	23.5	17.2	105.8	77.6
Witten-Herdecke U	82.0	21.4	26.1	38.5	46.9	22.2	27.0
Wuppertal U	329.0	1.8	0.5	42.2	12.8	285.0	86.6
Würzburg U	1,396.7	665.7	47.7	175.3	12.5	555.8	39.8
Report subtotal[1)]	**70,844.6**	**27,142.2**	**38.3**	**9,309.7**	**13.1**	**34,392.8**	**48.5**
Other HEIs	**9,156.3**	**515.9**	**5.6**	**509.0**	**5.6**	**8,131.4**	**88.8**
HEIs in total	**80,000.9**	**27,658.0**	**34.6**	**9,818.6**	**12.3**	**42,524.2**	**53.2**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

Source:

Federal Statistical Office: Current expenditure, administrative income, third-party funding income and current basic funds by higher education institution (2001 to 2003).

Calculated by the DFG.

Table A-7:
Third-party funding income from 2001 to 2003 by higher education institution and DFG research area[1] (in million euros)

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MPM[2]	ELE	CEA	No classification possible	"No classification possible" share of total
Munich TU	409.4		14.2	8.5	84.1	45.0	28.7	45.3	4.7	1.1	57.8	48.6	26.3	45.0	11.0
Aachen TH	406.5	3.7	4.5	10.3	41.0		13.9	18.1	5.6	8.3	192.1	44.3	30.2	34.3	8.4
Munich U	368.3	26.4	28.1	16.7	213.0	7.5	17.3	23.1	3.2	17.3		4.3		11.3	3.1
Stuttgart U	322.1	4.4	26.7	5.0			13.9	10.9	1.0	1.9	135.8	27.6	44.5	50.5	15.7
Berlin HU	313.0	17.9	28.9	12.1	198.3	5.1	5.6	14.5	6.0	1.7		4.9		18.0	5.8
Heidelberg U	281.0	14.2	10.0	31.5	153.9		14.8	26.6	12.9	5.3		0.1		11.8	4.2
Dresden TU	249.8	6.8	17.3	2.6	30.6	12.2	9.8	13.8	0.9	0.8	83.6	41.0	16.3	14.0	5.6
Erlangen-Nuremberg U	239.2	6.1	12.8	9.8	83.6		10.9	16.4	1.2	3.3	59.4	21.0		14.7	6.1
Karlsruhe TH	232.3	0.9	13.4	4.2			8.1	13.4	7.2	15.4	53.1	40.4	40.0	36.1	15.6
Berlin FU	231.3	27.1	18.6	10.2	76.6	6.1	6.6	8.2	42.7	10.3		1.2		23.5	10.2
Freiburg U	230.8	11.6	7.9	22.9	115.4	14.3	12.7	12.3	2.5	7.0		15.9		8.4	3.7
Göttingen U	226.9	4.6	7.6	16.4	76.6	29.0	10.4	9.0	1.3	5.7		0.5		65.8	29.0
Tübingen U	218.9	27.4	8.4	19.4	98.1		13.2	15.4	6.6	16.1		7.3		6.9	3.2
Berlin TU	213.7	5.5	11.1	1.5		9.4	15.2	15.2	16.2	2.2	70.5	31.3	7.6	28.1	13.1
Bonn U	213.4	18.0	6.2	12.6	70.1	11.6	14.5	19.5	7.0	15.5		7.6	4.0	26.8	12.6
Münster U	191.0	18.4	19.7	9.6	82.5		16.2	10.9	4.3	15.2	0.2	2.4		11.6	6.1
Hamburg U	190.1	10.5	7.8	12.9	78.1	1.5	5.5	8.4	0.4	9.8		3.7		51.4	27.0
Bremen U	188.6	2.8	16.7	15.5			3.5	20.8	4.6	30.2	40.5	27.5		26.6	14.1
Cologne U	185.1	22.6	18.2	16.0	83.5		6.7	17.5	1.2	13.5		0.1		5.8	3.1
Frankfurt/Main U	184.5	18.9	17.1	8.9	100.2		8.7	12.9	0.8	5.7		1.3		10.0	5.4
Bochum U	180.6	12.5	21.7	19.1	37.6		11.2	17.2	2.1	8.0	20.1	13.8	11.1	6.3	3.5
Duisburg-Essen U	180.5	9.3	18.7	7.4	69.3	0.3	9.5	11.4	1.8	1.2	18.8	22.0	5.5	5.4	3.0
Würzburg U	175.3	5.0	8.7	25.6	97.0		9.3	19.0	1.0	2.0		2.2		5.6	3.2
Mainz U	172.4	14.4	5.2	7.5	84.0		23.3	18.2	0.9	7.8		0.3		10.6	6.2
Hannover U	168.9	1.3	5.6	2.6		8.1	6.3	6.2	1.0	2.2	53.8	7.5	17.3	57.0	33.8
Darmstadt TU	165.8	1.9	5.1	5.6			8.8	16.3	1.8	16.1	48.3	29.2	21.3	11.5	6.9
Kiel U	155.9	3.1	3.3	3.6	55.6	11.1	2.6	6.1	0.6	10.3	4.2	1.7		53.7	34.4
Ulm U	134.8		3.6	6.0	76.6		7.7	6.8	1.0			21.5		11.7	8.7
Brunswick TU	125.4	0.5	3.0	9.7	1.0		7.5	5.1	0.9	2.6	40.2	22.9	24.4	7.7	6.1
Leipzig U	123.2	10.5	13.8	4.2	44.3	4.7	7.7	10.4	0.8	4.8	0.2	4.6	1.9	15.2	12.3
Giessen U	120.7	7.5	6.0	11.3	54.2	24.0	2.1	9.6	0.5	1.2		0.02		4.4	3.6
Hannover MedH	113.0				113.0										
Düsseldorf U	111.8	4.4	5.3	18.9	68.2		4.8	6.2	0.4	0.1		0.2		3.3	2.9
Jena U	111.0	7.8	10.5	10.7	38.9		8.4	20.2	1.1	4.1		0.9		8.4	7.5
Regensburg U	109.5	5.3	6.0	12.1	57.7		7.4	8.7	0.5	1.9				9.8	8.9
Dortmund U	104.1	1.2	11.4	0.03			3.4	6.9	5.9	0.01	39.4	19.8	7.7	8.5	8.2
Marburg U	104.1	9.0	9.4	11.2	50.5		9.0	4.7	1.9	2.6		0.7		5.2	5.0
Saarbrücken U	103.9	11.0	15.4	2.0	33.4		5.5	6.0	1.5	1.7	10.4	9.0		8.0	7.7
Halle-Wittenberg U	103.9	5.2	5.0	10.5	31.4	9.5	4.9	3.8	0.3	2.6	8.2	0.5		22.0	21.1
Magdeburg U	94.1	0.8	5.2	0.7	35.9		0.4	3.1	1.4		23.4	13.8		9.5	10.1
Bielefeld U	92.5	11.9	26.6	20.7			3.7	9.5	3.9			7.2		9.1	9.8
Kaiserslautern TU	84.9		3.4	5.5			5.1	19.2	5.1		18.6	14.1	6.0	7.8	9.2
Paderborn U	75.4	1.4	8.8	0.8		0.7	3.6	4.4	3.1	0.4	23.9	24.5	0.2	3.6	4.8
Rostock U	73.7	1.6	2.4	4.6	25.8	5.3	1.3	6.6	0.1		8.5	15.1	0.8	1.5	2.0
Constance U	65.6	5.5	6.4	9.7			2.4	10.8	1.0			0.4		29.4	44.8
Bayreuth U	64.3	3.9	3.9	8.4			9.4	6.1	1.8	13.4	6.9	0.1		10.5	16.3
Freiberg TU	61.4		1.5				4.9	1.3	1.0	8.3	40.2	1.2		3.0	4.9
Hohenheim U	61.0	0.04	5.0	7.0		35.2	0.4	0.3	0.2					12.7	20.8
Kassel U	60.0	2.1	5.9	0.6		8.3	0.5	4.0	0.6	0.01	11.0	10.5	9.3	7.2	11.9
Chemnitz TU	58.8	0.6	7.3				2.3	6.7	1.4	0.4	23.0	14.3		2.7	4.6
Potsdam U	53.3	8.7	7.8	9.7			3.0	10.1	1.3	4.5	0.1	1.0		7.2	13.5
Oldenburg U	52.0	1.2	13.0	2.5			3.3	9.9	8.9	2.6		3.9		6.7	12.9
Clausthal TU	49.7		0.1				1.4	6.8	0.4	1.4	30.1	0.1		9.6	19.2
Lübeck U	49.0				42.2							2.8		4.1	8.3
Cottbus TU	47.9	0.4	0.9				1.0	1.5	0.6		30.3	1.5	4.2	7.4	15.5
Hamburg-Harburg TU	44.8										22.9	11.3	10.3	0.3	0.7
Greifswald U	44.1	2.8	5.1	9.4	14.3		2.0	4.4	0.9	1.3				3.9	8.8

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Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MPM[2]	ELE	CEA	No classification possible	"No classification possible" share of total
Wuppertal U	42.2	1.7	5.5				5.8	7.2	0.9		5.1	9.0	5.2	1.8	4.3
Ilmenau TU	40.5		2.4					1.4	0.2		13.7	17.9		4.8	12.0
Trier U	40.1	8.2	15.6	0.3					0.2	7.9		1.3	0.01	6.5	16.2
Witten-Herdecke U	38.5		10.8	6.9	14.0		1.7		1.1					4.0	10.5
Siegen U	34.1	2.6	4.3				2.9	5.9	0.04		6.7	4.0	1.0	6.7	19.7
Mannheim U	33.0	2.8	13.2						0.3	0.6		4.6		11.6	35.1
Hagen FernU	29.9	0.5	13.6						0.4			6.8		8.6	28.7
Augsburg U	29.9	3.2	4.7	0.01			0.1	12.7	1.7	0.2		0.9		6.4	21.4
Osnabrück U	29.7	4.6	8.7	3.8			0.7	3.0	5.3	0.4		0.03		3.2	10.8
Weimar U	23.5	0.3	3.5										19.3	0.4	1.7
Frankfurt/Oder U	15.8	4.2	6.4											5.2	32.9
Hannover TiHo	15.3			0.1		14.9								0.4	2.6
Lüneburg U	15.3	0.2	5.6	0.002		1.4	0.3		2.2	0.01	1.3		1.5	2.7	17.5
Cologne DSHS	15.2		15.2												
Munich UdBW	14.6		0.6								3.0	3.7	5.9	1.3	9.2
Bremen H	13.9		2.1								3.1	2.0	3.3	3.4	24.2
Koblenz-Landau U	13.7	0.8	3.1	0.6			0.1	0.1	0.03	0.1		5.0		4.0	28.9
Hamburg UdBW	12.9		3.2								7.5	1.7		0.5	3.9
Passau U	12.1	1.5	3.4						2.7	0.1		1.8		2.6	21.8
Bamberg U	11.7	3.0	6.3							0.1		0.4		1.9	16.6
Eichstätt-Ingolstadt KathU	10.2	1.3	4.0						0.01	0.3		0.5		4.0	39.2
Erfurt U	7.9	2.1	4.7							0.04				1.0	13.2
Berlin UdK	7.1	4.2	0.6										1.4	0.9	12.5
Berlin FHTW	5.5	0.6	1.3								0.9			2.7	48.8
Bremen IU	1.9		0.6	0.7			0.2	0.03		0.4				0.001	0.1
Munich HPhil	1.3	1.2												0.2	11.7
Karlsruhe HfG	0.9													0.9	100.0
Report subtotal[3]	**9,309.7**	**441.6**	**695.5**	**507.1**	**2,630.1**	**265.3**	**432.5**	**649.7**	**201.3**	**298.0**	**1,216.3**	**669.4**	**326.4**	**976.5**	**10.5**
Other HEIs	**509.0**	**34.4**	**116.1**	**4.0**		**20.1**	**3.1**	**3.5**	**6.7**	**0.8**	**93.2**	**50.9**	**20.5**	**155.5**	**30.6**
HEIs in total	**9,818.6**	**476.0**	**811.6**	**511.1**	**2,630.1**	**285.4**	**435.7**	**653.3**	**208.0**	**298.7**	**1,309.5**	**720.3**	**346.9**	**1,132.0**	**11.5**
Based on: N HEIs	**285**	**159**	**202**	**75**	**38**	**41**	**77**	**74**	**89**	**64**	**119**	**150**	**78**	**221**	

>> See page 135 for the abbreviation key

[1] Cf. Table A-3 for the classification system used in the report.

[2] The classification system of teaching and research fields used by the Federal Statistical Office in the area of mechanical engineering does not allow sufficient subject differentiation. Therefore, the subjects have been combined into one research area, "mechancial and process engineering and materials science (MPM)".

[3] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

Source:

Federal Statistical Office: Third-party funding income in total by higher education institution and teaching and research field (2001 to 2003).

Calculated by the DFG.

Table A-8:
DFG awards from 2002 to 2004 by higher education institution and research area (in million euros)

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Munich U	130.8	13.8	12.7	37.8	36.9	3.0	7.3	10.7	1.0	4.4			0.1	3.1	
Aachen TH	126.2	1.6	1.8	4.7	9.9	0.5	8.7	2.4	3.3	4.9	30.4	15.3	22.2	15.6	4.9
Heidelberg U	105.1	9.2	5.0	28.7	31.2		8.8	8.5	5.9	4.6	0.3	1.5		1.3	0.1
Würzburg U	104.7	4.6	3.6	30.3	50.6	0.6	5.6	6.4	0.4	1.0		0.1	0.6	0.9	
Berlin HU	101.5	11.6	8.6	20.3	31.8	1.9	4.1	9.9	6.4	2.1		0.5		4.1	0.1
Karlsruhe TH	100.5	0.3	1.4	2.7	2.5		13.8	16.8	0.5	9.7	9.3	13.1	5.5	18.6	6.3
Erlangen-Nuremberg U	100.3	4.2	2.5	10.6	29.1	0.01	11.3	8.3	1.5	1.8	11.4	5.0	5.2	9.5	
Tübingen U	99.7	19.0	5.9	16.1	35.5	0.8	3.6	6.8	2.4	5.1	0.1	0.3	0.4	3.7	
Munich TU	99.3	0.2	1.4	11.7	20.1	6.9	8.6	11.0	3.7	1.9	9.8	8.7	0.5	11.8	3.0
Berlin FU	96.6	19.4	6.2	15.2	22.4	2.4	6.2	11.4	4.5	5.6	0.1	1.7	0.2	1.3	
Freiburg U	91.1	8.2	4.3	23.8	30.9	1.2	7.3	4.9	2.9	2.5		0.2	0.5	4.4	
Göttingen U	85.1	4.5	4.3	22.3	22.4	8.9	7.5	7.9	1.6	3.8	1.0	0.04	0.8	0.1	
Bonn U	81.9	6.8	6.6	15.3	22.8	2.0	7.0	7.1	4.7	6.4	0.001	0.2	0.2	2.5	0.3
Stuttgart U	79.1	2.2	2.2	4.8	0.6	0.1	6.6	5.5	2.4	1.9	25.0	8.0	4.4	11.7	3.6
Münster U	73.5	13.7	3.2	11.1	19.6	0.1	10.0	4.4	5.1	5.1		0.2	0.7	0.3	
Bochum U	73.3	6.4	3.6	14.5	6.2	0.3	4.5	9.3	2.1	4.9	6.2	2.6	5.4	3.6	3.5
Hamburg U	72.1	11.2	4.4	13.6	14.1	0.7	3.6	13.0	0.9	9.2		0.2	0.1	1.0	0.2
Cologne U	70.7	12.3	4.6	16.4	14.7	0.7	4.8	8.6	0.6	5.4		0.1		2.4	0.1
Mainz U	69.2	7.7	1.3	5.1	32.7	0.3	6.3	10.2	1.0	4.0			0.4	0.1	
Frankfurt/Main U	66.5	12.4	7.8	18.1	13.9		4.3	4.3	1.1	3.5	0.1	0.1		0.8	
Dresden TU	66.5	4.5	3.1	2.0	3.3	1.5	5.1	7.0	0.3	4.9	8.5	4.1	5.4	12.1	4.5
Berlin TU	63.6	2.2	2.6	2.5	0.8	2.2	5.0	5.2	10.8	2.9	10.8	7.7	1.8	7.4	1.5
Bremen U	62.2	1.7	4.9	1.8	0.2	0.1	0.8	3.1	0.5	27.7	4.9	4.9	4.1	7.5	0.1
Hannover U	60.2	0.3	1.1	1.4	1.6	2.8	3.8	9.0	0.8	3.8	23.2	3.3	4.1	3.9	1.3
Darmstadt TU	53.8	0.01	2.4	3.9	0.7	0.3	3.1	5.4	1.0	1.5	9.5	9.4	7.4	7.2	1.9
Giessen U	50.4	7.2	4.3	9.1	13.8	10.6	2.3	2.5	0.2	0.4					
Marburg U	50.3	4.0	3.8	13.7	18.2	0.2	2.5	4.8	0.3	1.6			0.1	1.0	
Duisburg-Essen U	49.7	1.2	3.6	2.5	12.3		4.1	10.7	3.8	2.0	1.2	4.1	0.5	2.3	1.4
Düsseldorf U	49.0	2.9	3.2	15.3	19.1	0.1	1.8	5.1	0.4	0.1	0.1	0.3	0.2	0.6	
Jena U	46.8	8.9	4.9	10.1	5.9	0.1	3.9	6.0	1.2	2.4	0.1	0.9	0.6	1.7	
Brunswick TU	45.9	0.7	0.8	4.9	1.3	0.9	1.7	2.2	0.1	1.0	8.2	5.8	1.8	9.4	7.1
Dortmund U	45.8	0.3	3.6		0.8		3.6	3.4	1.9	0.2	14.4	4.9	0.8	11.4	0.6
Ulm U	44.5	0.2	0.3	9.0	20.8	0.03	7.2	2.0	0.01	0.1	0.1	0.5	0.1	4.3	
Constance U	43.7	11.1	7.1	7.2	3.5	0.1	1.6	10.1	0.2	1.7		0.3	0.2	0.6	
Halle-Wittenberg U	41.3	6.1	2.4	13.7	3.8	2.9	4.6	4.5	0.01	1.1	0.001	1.9	0.1	0.2	0.01
Kiel U	41.0	2.9	2.5	4.9	9.1	3.8	2.1	4.0	1.3	7.0			0.7	2.5	0.1
Regensburg U	40.0	3.7	1.3	9.6	12.7		3.9	7.5	0.6	0.5		0.1	0.1		
Bielefeld U	40.0	8.2	8.1	8.3	1.1	0.3	2.9	4.1	2.9			0.4	0.1	3.7	
Saarbrücken U	39.3	5.1	3.0	6.4	9.0		2.1	3.8	1.0	0.1	2.1	0.5	1.6	4.7	
Leipzig U	38.4	7.5	2.0	6.6	5.9	0.7	4.9	4.9	1.3	1.3		1.1		1.8	0.4
Hannover MedH	33.6		0.1	7.5	24.7	0.9	0.5							0.04	
Bayreuth U	30.0	3.6	0.6	7.1	0.6	2.1	7.4	2.7	1.4	3.1	0.001	0.6	0.6	0.3	0.1
Kaiserslautern TU	26.0		0.2	3.1	1.5	0.05	0.9	5.9	2.0	0.2	3.2	2.1	0.9	5.3	0.6
Chemnitz TU	24.4	0.1	2.0		0.02		2.6	1.3	2.5		7.3	0.6	1.8	6.2	
Paderborn U	23.6	1.0	0.7				0.9	2.0	1.9	0.1	4.1	0.7	0.8	11.2	
Potsdam U	23.2	6.5	3.4	3.7	0.1	0.3	1.3	2.0	0.7	4.4	0.3			0.4	
Magdeburg U	21.4	0.1	1.0	2.5	6.3	0.02	0.2	0.9	0.8	0.1	2.3	3.3	0.3	3.6	
Hohenheim U	16.1	0.03	1.0	2.8	0.6	10.0	0.3			0.7	0.2			0.4	
Osnabrück U	14.6	1.3	4.3	4.3	1.4		0.2	2.4	0.3	0.2		0.01		0.1	
Rostock U	14.6	0.6	0.3	1.7	2.4	1.0	0.5	3.2	0.003	0.01	0.8	1.4	0.4	2.3	
Oldenburg U	14.2	0.4	0.4	2.3	1.6	0.1	1.2	0.5	0.1	4.4	0.1	0.6	0.1	2.3	0.2
Mannheim U	14.2	1.5	10.0	0.2	0.4				0.3	0.03		0.1		1.6	
Lübeck U	14.1	0.01	0.1	1.8	10.1		0.5		0.1	0.001				1.5	
Clausthal TU	13.5		0.1		0.02		2.1	0.3	0.03	0.3	2.8	1.3	5.9	0.7	
Freiberg TU	12.9	0.1	0.3			0.1	0.5	0.1	0.7	1.7	1.4	3.8	4.3		0.1
Augsburg U	12.9	2.2	1.9				0.5	5.0	1.5	0.4			0.2	1.1	
Hamburg-Harburg TU	11.4	0.003			0.1	0.01	0.5	0.1		0.2	0.5	2.7	3.0	2.9	1.5

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Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Trier U	11.0	5.3	3.4	0.2	0.1	0.3	0.05		0.003	1.4				0.3	
Ilmenau TU	10.9		0.3			0.1	0.03	0.3	0.1		0.7	2.8	0.9	5.7	
Siegen U	10.7	2.9	1.4		0.1		1.5	0.4	0.1	0.1	0.1	0.3	2.1	1.6	0.3
Kassel U	10.5	0.6	1.5	0.6	0.3	0.9	0.2	1.5	0.2	0.2	1.5	0.1	1.3	0.5	1.1
Greifswald U	9.1	1.2	0.7	1.4	1.0	0.03	0.6	3.1	0.2	0.5		0.3		0.1	
Hannover TiHo	7.8			0.8	1.6	5.5									
Wuppertal U	7.1	0.6	0.7		0.1		0.6	1.4	0.3	0.01		0.3		2.5	0.7
Bamberg U	6.9	1.9	4.4							0.1	0.02			0.3	0.2
Cottbus TU	6.3	0.3	0.2	0.2	0.03	1.3		0.1		1.6	0.2	0.5	0.4	0.8	0.7
Weimar U	4.9	0.03							0.01	0.1	0.1	0.002		0.2	4.4
Bremen IU	4.9	0.003	1.0	0.8	0.5	0.1	0.8	0.5		0.5		0.1		0.6	
Munich UdBW	3.6	0.2	0.6						0.4	0.5	0.4	0.7		0.5	0.3
Hamburg UdBW	2.7	0.1	1.0								0.8	0.6	0.2	0.1	
Witten-Herdecke U	2.2		0.1	1.7	0.4										
Erfurt U	1.9	1.5	0.4								0.1				
Hagen FernU	1.8	0.2	0.7						0.004					0.8	
Frankfurt/Oder U	1.6	1.2	0.4												
Koblenz-Landau U	1.2	0.2	0.2				0.1							0.6	
Eichstätt-Ingolstadt KathU	1.2	0.3	0.1						0.02	0.4				0.3	
Berlin UdK	1.1	0.9													0.2
Lüneburg U	0.9	0.01	0.9												
Karlsruhe HfG	0.8	0.8													
Passau U	0.7	0.2	0.01						0.1					0.5	
Cologne DSHS	0.5		0.1		0.5						0.002				
Bremen H	0.5											0.1		0.2	0.3
Munich HPhil	0.5	0.5													
Berlin FHTW	0.5	0.4	0.1												
Report subtotal[1)]	**3,232.0**	**284.9**	**201.2**	**498.5**	**646.1**	**79.6**	**231.0**	**306.5**	**94.5**	**169.6**	**203.6**	**130.5**	**100.1**	**234.4**	**51.6**
Other HEIs	**9.2**	**2.0**	**1.8**	**0.2**	**0.3**	**0.3**	**0.3**	**0.5**	**0.2**	**0.4**	**0.2**	**0.3**	**0.7**	**1.2**	**0.9**
HEIs in total	**3,241.1**	**286.9**	**203.1**	**498.6**	**646.4**	**79.9**	**231.2**	**307.0**	**94.7**	**170.0**	**203.8**	**130.8**	**100.8**	**235.5**	**52.5**
Based on: N HEIs	**154**	**96**	**94**	**59**	**68**	**54**	**65**	**62**	**67**	**70**	**50**	**61**	**56**	**82**	**46**

>> See page 135 for the abbreviation key

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

Table A-9:
DFG awards from 2002 to 2004 in relation to the total number of professors/scientists and academics by higher education institution

Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Karlsruhe TH	100.5	247	406.9	2,067	48.7
Hannover MedH	33.6	102	329.7	1,408	23.9
Aachen TH	126.2	391	323.1	3,686	34.2
Stuttgart U	79.1	254	311.2	2,475	31.9
Constance U	43.7	153	286.3	747	58.4
Würzburg U	104.7	368	285.0	2,357	44.4
Tübingen U	99.7	366	272.7	2,886	34.5
Heidelberg U	105.1	409	257.1	3,087	34.0
Freiburg U	91.1	361	252.1	2,905	31.3
Munich TU	99.3	410	242.2	3,871	25.7
Ulm U	44.5	190	235.0	1,728	25.8
Erlangen-Nuremberg U	100.3	472	212.5	3,136	32.0
Darmstadt TU	53.8	267	201.4	1,604	33.5
Göttingen U	85.1	423	201.0	2,605	32.7
Bochum U	73.3	373	196.3	2,259	32.4
Lübeck U	14.1	72	195.5	925	15.2
Brunswick TU	45.9	237	193.7	1,422	32.3
Berlin TU	63.6	329	193.3	1,959	32.5
Munich U	130.8	707	185.0	4,883	26.8
Bremen U	62.2	339	183.8	1,661	37.5
Berlin FU	96.6	529	182.5	2,874	33.6
Berlin HU	101.5	563	180.2	4,261	23.8
Hannover U	60.2	338	178.4	1,912	31.5
Clausthal TU	13.5	76	178.0	391	34.6
Düsseldorf U	49.0	277	176.8	1,937	25.3
Bonn U	81.9	477	171.9	2,774	29.5
Mainz U	69.2	413	167.3	2,635	26.3
Bayreuth U	30.0	182	164.7	803	37.4
Bielefeld U	40.0	245	163.3	1,206	33.2
Dortmund U	45.8	283	161.8	1,443	31.7
Kaiserslautern TU	26.0	164	159.1	849	30.7
Chemnitz TU	24.4	156	156.9	747	32.7
Saarbrücken U	39.3	252	156.4	1,828	21.5
Regensburg U	40.0	264	151.5	1,720	23.3
Münster U	73.5	494	148.9	3,303	22.3
Cologne U	70.7	489	144.5	2,882	24.5
Frankfurt/Main U	66.5	475	140.0	2,628	25.3
Giessen U	50.4	361	139.4	2,016	25.0
Hohenheim U	16.1	117	137.9	620	26.0
Jena U	46.8	341	137.5	2,154	21.7
Marburg U	50.3	369	136.2	1,982	25.4
Hannover TiHo	7.8	61	128.4	268	29.2
Dresden TU	66.5	528	125.9	3,580	18.6
Paderborn U	23.6	188	125.3	892	26.4
Freiberg TU	12.9	104	124.4	539	24.0
Ilmenau TU	10.9	90	121.2	616	17.6
Mannheim U	14.2	118	120.9	594	23.9
Halle-Wittenberg U	41.3	375	110.0	2,242	18.4
Hamburg-Harburg TU	11.4	106	108.1	510	22.4
Kiel U	41.0	381	107.6	2,271	18.1
Potsdam U	23.2	218	106.4	979	23.7
Magdeburg U	21.4	214	99.8	1,588	13.5
Duisburg-Essen U	49.7	520	95.7	2,609	19.1
Hamburg U	72.1	800	90.1	3,124	23.1
Leipzig U	38.4	439	87.7	2,464	15.6

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Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Osnabrück U	14.6	176	83.3	565	25.9
Augsburg U	12.9	157	82.2	650	19.8
Oldenburg U	14.2	174	81.8	640	22.2
Trier U	11.0	158	69.9	554	19.9
Bremen IU	4.9	72	68.4	132	37.3
Witten-Herdecke U	2.2	33	65.8	170	12.8
Weimar U	4.9	91	54.4	402	12.3
Bamberg U	6.9	128	54.0	387	17.9
Cottbus TU	6.3	120	52.4	558	11.3
Rostock U	14.6	285	51.2	1,662	8.8
Siegen U	10.7	219	48.6	677	15.7
Greifswald U	9.1	214	42.5	1,174	7.7
Kassel U	10.5	280	37.5	967	10.9
Hamburg UdBW	2.7	91	29.7	299	9.1
Frankfurt/Oder U	1.6	55	28.6	177	8.8
Wuppertal U	7.1	256	27.8	776	9.2
Munich UdBW	3.6	150	23.8	443	8.0
Cologne DSHS	0.5	23	23.6	194	2.8
Erfurt U	1.9	83	23.5	274	7.1
Hagen FernU	1.8	76	23.2	424	4.2
Eichstätt-Ingolstadt KathU	1.2	114	10.2	292	4.0
Koblenz-Landau U	1.2	127	9.1	341	3.4
Passau U	0.7	93	7.6	321	2.2
Berlin UdK	1.1	173	6.4	329	3.4
Lüneburg U	0.9	190	4.8	410	2.2
Bremen H	0.5	150	3.5	205	2.6
Berlin FHTW	0.5	203	2.5	273	1.9
Total[1)]	**3,230.6**	**21,361**	**151.2**	**124,205**	**26.0**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and at which 20 professors or more (full-time equivalents) were employed full-time in 2003.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution (2003).

Calculated by the DFG.

Table A-10:
DFG awards from 2002 to 2004 in relation to the total number of professors/scientists and academics by higher education institution: Humanities and social sciences

Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Constance U	18.2	93	196.5	369	49.3
Tübingen U	24.9	170	146.3	607	41.0
Mannheim U	11.6	93	125.1	394	29.4
Bielefeld U	16.3	154	105.9	524	31.1
Freiburg U	12.5	123	101.7	478	26.2
Heidelberg U	14.2	141	101.1	538	26.4
Berlin FU	25.6	262	97.7	920	27.8
Stuttgart U	4.4	47	93.7	215	20.5
Jena U	13.9	150	92.5	540	25.7
Munich U	26.5	298	88.8	1,161	22.8
Saarbrücken U	8.1	96	84.5	435	18.6
Berlin HU	20.2	239	84.5	946	21.4
Frankfurt/Main U	20.2	250	81.0	812	24.9
Giessen U	11.5	142	80.9	432	26.6
Potsdam U	9.9	125	79.2	498	19.9
Münster U	16.8	219	76.9	937	18.0
Bonn U	13.4	175	76.5	570	23.5
Trier U	8.7	124	70.8	432	20.3
Würzburg U	8.2	127	64.6	452	18.2
Düsseldorf U	6.1	96	63.2	321	18.9
Cologne U	16.9	271	62.5	972	17.4
Göttingen U	8.8	154	57.0	542	16.2
Aachen TH	3.5	61	56.6	242	14.3
Berlin TU	4.8	88	55.1	352	13.8
Bamberg U	6.3	115	54.7	301	21.0
Bochum U	10.0	191	52.5	797	12.6
Bayreuth U	4.2	81	52.0	275	15.3
Halle-Wittenberg U	8.5	165	51.5	602	14.1
Dresden TU	7.6	147	51.5	537	14.1
Marburg U	7.8	164	47.4	491	15.9
Leipzig U	9.5	202	47.0	709	13.4
Osnabrück U	5.6	124	44.8	355	15.6
Bremen IU	1.0	24	43.6	36	28.8
Mainz U	8.9	206	43.2	700	12.7
Kiel U	5.5	135	40.6	404	13.5
Darmstadt TU	2.4	59	40.5	202	11.8
Hamburg U	15.7	387	40.5	925	16.9
Bremen U	6.6	164	40.1	429	15.3
Karlsruhe TH	1.7	43	39.8	234	7.3
Siegen U	4.3	110	39.5	269	16.1
Regensburg U	5.0	126	39.4	443	11.2
Augsburg U	4.1	106	38.8	414	9.9
Erlangen-Nuremberg U	6.7	175	37.9	621	10.7
Dortmund U	3.9	114	34.3	367	10.6
Chemnitz TU	2.1	62	33.5	228	9.2
Hohenheim U	1.1	34	31.3	123	8.6
Frankfurt/Oder U	1.6	53	29.7	161	9.7
Brunswick TU	1.5	60	24.6	187	7.9
Erfurt U	1.9	81	23.3	263	7.2
Greifswald U	2.0	90	21.9	276	7.1
Duisburg-Essen U	4.8	234	20.4	669	7.1
Munich UdBW	0.8	41	20.4	113	7.4
Hagen FernU	0.9	48	19.8	223	4.3
Paderborn U	1.7	91	19.0	262	6.6
Hamburg UdBW	1.1	63	17.3	176	6.2

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Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Magdeburg U	1.1	65	16.6	291	3.7
Kassel U	2.1	140	15.0	358	5.9
Wuppertal U	1.2	108	11.5	260	4.8
Hannover U	1.4	128	10.9	408	3.4
Rostock U	0.9	86	10.6	284	3.2
Oldenburg U	0.9	93	9.4	288	3.0
Lüneburg U	0.9	110	8.2	225	4.0
Berlin UdK	0.9	159	5.9	292	3.2
Koblenz-Landau U	0.4	92	4.8	233	1.9
Berlin FHTW	0.5	109	4.7	149	3.5
Eichstätt-Ingolstadt KathU	0.5	101	4.6	254	1.8
Cologne DSHS	0.1	23	3.5	193	0.4
Passau U	0.2	74	2.5	194	1.0
Weimar U	0.03	31	1.0	91	0.3
Total[1)]	**481.0**	**8,709**	**55.2**	**29,000**	**16.6**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and at which twenty professors or more (full-time equivalents) were employed full-time in the humanities and social sciences in 2003.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-11:
DFG awards from 2002 to 2004 in relation to the total number of professors/scientists and academics by higher education institution: Life sciences

Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Würzburg U	81.6	157	519.5	1,495	54.6
Tübingen U	52.4	106	497.0	1,747	30.0
Bochum U	21.0	43	494.4	347	60.6
Bielefeld U	9.7	21	466.4	133	72.6
Constance U	10.8	24	451.1	141	76.9
Freiburg U	55.9	146	382.4	1,819	30.7
Heidelberg U	59.8	171	350.3	1,997	30.0
Hannover MedH	33.0	100	331.3	1,356	24.3
Göttingen U	53.6	176	304.0	1,620	33.1
Mainz U	38.1	127	299.7	1,424	26.8
Ulm U	29.8	101	296.9	1,219	24.5
Erlangen-Nuremberg U	39.7	139	286.7	1,331	29.8
Munich U	77.7	273	285.2	3,000	25.9
Regensburg U	22.3	82	272.0	983	22.7
Düsseldorf U	34.4	127	271.2	1,371	25.1
Brunswick TU	7.2	27	267.0	163	44.3
Berlin FU	39.9	154	260.0	1,319	30.3
Cologne U	31.8	124	256.3	1,358	23.4
Bonn U	40.2	159	253.3	1,349	29.8
Frankfurt/Main U	31.9	128	249.8	1,296	24.6
Berlin HU	54.1	222	244.0	2,759	19.6
Marburg U	32.1	133	241.1	1,175	27.3
Munich TU	38.7	165	235.1	1,616	24.0
Giessen U	33.4	160	208.5	1,318	25.4
Saarbrücken U	15.4	75	206.0	902	17.1
Lübeck U	11.9	58	205.9	852	14.0
Aachen TH	15.0	78	192.1	1,145	13.1
Münster U	30.8	161	191.8	1,565	19.7
Hohenheim U	13.4	72	186.2	379	35.4
Duisburg-Essen U	14.8	80	186.0	935	15.9
Halle-Wittenberg U	20.3	123	165.4	1,167	17.4
Jena U	16.0	106	151.3	1,162	13.8
Potsdam U	4.1	28	147.2	114	35.7
Kiel U	17.8	122	145.3	1,249	14.2
Magdeburg U	8.8	62	142.6	703	12.6
Hannover U	5.8	42	137.8	182	31.8
Hannover TiHo	7.8	58	135.1	260	30.1
Hamburg U	28.4	229	124.0	1,437	19.8
Witten-Herdecke U	2.1	21	103.4	111	19.1
Bremen U	2.0	20	101.0	88	22.9
Leipzig U	13.2	148	89.4	1,297	10.2
Kassel U	1.7	26	65.7	100	17.0
Dresden TU	6.8	104	65.1	1,191	5.7
Rostock U	5.1	92	55.2	901	5.6
Greifswald U	2.4	81	30.1	721	3.4
Total[1)]	**1,173.2**	**4,845**	**242.1**	**48,800**	**24.0**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and at which twenty professors or more (full-time equivalents) were employed full-time in life sciences subjects in 2003.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-12:
DFG awards from 2002 to 2004 in relation to the total number of professors/scientists and academics by higher education institution: Natural sciences

Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Karlsruhe TH	40.8	72	566.7	477	85.6
Bremen U	32.1	73	439.7	345	93.0
Constance U	13.6	31	438.1	194	70.1
Heidelberg U	27.8	89	312.8	454	61.3
Munich TU	25.2	84	301.5	616	40.9
Mainz U	21.6	73	296.1	451	47.9
Berlin TU	23.9	85	282.1	437	54.6
Freiburg U	17.6	63	279.1	305	57.6
Berlin FU	27.8	100	278.5	500	55.6
Stuttgart U	16.5	60	274.2	348	47.2
Berlin HU	22.5	83	272.4	423	53.1
Bochum U	20.9	78	267.4	514	40.6
Erlangen-Nuremberg U	22.9	90	255.2	408	56.1
Hannover U	17.4	70	247.9	313	55.4
Tübingen U	17.9	73	245.1	364	49.1
Münster U	24.7	101	244.1	587	42.0
Kiel U	14.5	59	243.9	271	53.4
Göttingen U	20.7	86	241.0	402	51.6
Regensburg U	12.5	54	231.5	269	46.4
Ulm U	9.2	40	230.5	193	47.6
Bonn U	25.2	110	229.3	561	45.0
Bayreuth U	14.6	67	218.1	316	46.2
Cologne U	19.5	93	209.5	454	42.9
Bielefeld U	9.9	48	205.6	207	47.8
Dresden TU	17.4	85	204.6	371	46.9
Aachen TH	19.4	96	201.9	480	40.4
Duisburg-Essen U	20.6	103	200.7	418	49.3
Jena U	13.5	70	192.5	383	35.2
Munich U	23.4	123	189.7	622	37.6
Würzburg U	13.4	75	180.3	359	37.4
Leipzig U	12.5	70	178.5	321	38.9
Hamburg U	26.6	149	178.3	568	46.9
Augsburg U	7.4	42	176.2	175	42.3
Kaiserslautern TU	9.1	52	175.3	239	38.1
Halle-Wittenberg U	10.2	59	172.4	258	39.5
Chemnitz TU	6.4	39	164.7	166	38.8
Saarbrücken U	7.0	43	161.9	222	31.3
Frankfurt/Main U	13.3	89	149.9	424	31.4
Potsdam U	8.4	57	148.2	276	30.6
Düsseldorf U	7.4	50	146.4	200	36.8
Marburg U	9.2	64	144.5	255	36.3
Dortmund U	9.0	67	135.0	291	31.1
Oldenburg U	6.1	46	133.0	185	33.1
Darmstadt TU	11.0	88	125.3	466	23.6
Osnabrück U	3.2	28	114.3	94	34.0
Giessen U	5.4	48	113.3	183	29.7
Paderborn U	5.0	48	104.1	184	27.2
Greifswald U	4.3	43	99.9	161	26.7
Freiberg TU	3.0	32	94.3	155	19.5
Brunswick TU	4.9	57	86.0	235	20.8
Clausthal TU	2.7	32	83.9	125	21.5
Magdeburg U	2.0	24	82.5	120	16.5
Rostock U	3.7	47	79.3	168	22.2
Bremen IU	1.8	26	68.9	56	32.3
Kassel U	2.2	34	64.2	119	18.4
Siegen U	2.0	38	51.6	125	15.7
Trier U	1.4	29	49.2	94	15.2
Wuppertal U	2.4	61	38.7	206	11.5
Total[1)]	**794.5**	**3,795**	**209.4**	**18,113**	**43.9**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and at which twenty professors or more (full-time equivalents) were employed full-time in natural sciences subjects in 2003.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-13:
DFG awards from 2002 to 2004 in relation to the total number of professors/scientists and academics by higher education institution: Engineering sciences

Higher education institution	Mio. €	Professors		Scientists/academics total	
		N	K € per prof.	N	K € per scientist
Aachen TH	88.3	155	571.7	1,728	51.1
Bremen U	21.5	43	500.2	356	60.4
Erlangen-Nuremberg U	31.1	68	460.0	610	50.9
Karlsruhe TH	52.8	119	443.7	1,184	44.6
Stuttgart U	52.8	134	393.7	1,588	33.2
Hannover U	35.7	93	383.7	829	43.1
Brunswick TU	32.3	90	359.1	807	40.0
Paderborn U	16.8	47	358.2	380	44.3
Bochum U	21.4	61	350.3	528	40.5
Dortmund U	32.0	92	348.2	725	44.2
Darmstadt TU	35.5	105	337.6	844	42.0
Chemnitz TU	15.9	54	294.3	321	49.4
Clausthal TU	10.7	39	273.9	243	44.0
Munich TU	33.7	143	236.6	1,400	24.1
Saarbrücken U	8.8	38	234.7	219	40.3
Berlin TU	29.3	134	219.1	1,030	28.4
Freiburg U	5.0	27	186.4	206	24.5
Dresden TU	34.7	188	184.2	1,391	25.0
Freiberg TU	9.5	53	178.9	303	31.3
Ilmenau TU	10.0	60	166.7	430	23.2
Magdeburg U	9.5	64	149.4	473	20.0
Ulm U	5.0	35	142.4	224	22.3
Kaiserslautern TU	12.1	85	142.1	439	27.5
Bonn U	3.2	24	132.0	149	21.2
Kiel U	3.3	28	118.8	138	24.1
Hamburg-Harburg TU	10.6	103	102.9	488	21.7
Duisburg-Essen U	9.5	96	98.4	488	19.4
Weimar U	4.8	58	82.8	289	16.6
Rostock U	4.9	60	81.1	302	16.1
Halle-Wittenberg U	2.2	28	79.8	147	15.2
Siegen U	4.3	69	62.2	247	17.3
Hamburg UdBW	1.6	26	62.1	111	14.5
Kassel U	4.5	80	56.6	325	13.9
Hamburg U	1.4	26	54.1	116	12.1
Hagen FernU	0.8	20	40.5	113	7.2
Wuppertal U	3.4	87	39.5	273	12.6
Cottbus TU	2.6	88	29.9	410	6.4
Munich UdBW	1.9	94	19.8	309	6.0
Bremen H	0.5	86	6.2	107	5.0
Total[1)]	**663.9**	**2,898**	**229.1**	**20,271**	**32.7**

[1)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and at which twenty professors or more (full-time equivalents) were employed full-time in engineering sciences subjects in 2003.

Source:

Federal Statistical Office: Full-time scientific and artistic staff (full-time equivalent) by higher education institution and teaching and research field (2003).

Calculated by the DFG.

Table A-14:
DFG awards from 2002 to 2004 by non-university research institution and research area (in million euros)

Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Institute of Plastics Processing (IKV)	Aachen	2.9						1.7				0.6			0.6	
FhI for Production Technology (IPT)	Aachen	1.8										1.4			0.4	
ACCESS	Aachen	0.9												0.9		
FhI for Laser Technology (ILT)	Aachen[1)]	0.8										0.3			0.5	
MPI for Heart and Lung Research, Kerckhoff Institute	Bad Nauheim	0.6			0.6											
Friedrich Baur Research Institute for Biomaterials (FBI)	Bayreuth	0.5												0.5		
German Institute of Human Nutrition (DIfE)	Bergholz-Rehbrücke	1.4			0.5	0.9										
Max Delbrück Centre for Molecular Medicine (MDC)	Berlin	11.4	0.003		6.8	4.4							0.1			
Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI)	Berlin	4.3			0.3			0.6	3.2						0.2	
Fritz Haber Institute of the Max Planck Society	Berlin	4.1						1.9	2.2							
MPI for Infection Biology	Berlin	3.5			0.1	3.3										
Zuse Institute Berlin (ZIB)	Berlin	3.0				0.1				2.9			0.1			
Leibniz Institute for Molecular Pharmacology (FMP)	Berlin	2.8			1.6	1.0		0.2								
Weierstrass Institute for Applied Analysis and Stochastics (WIAS)	Berlin	2.7							0.2	2.4	0.1	0.001				
German Institute for Economic Research (DIW)	Berlin	2.7		2.7												
MPI for Molecular Genetics	Berlin	2.4			0.8	1.6										
Prussian Cultural Heritage Foundation	Berlin	1.7	1.7													
Hahn Meitner Institute Berlin (HMI)	Berlin	1.7			0.2			0.1	0.6	0.1	0.004		0.3	0.4		
German Rheumatism Research Centre (DRFZ)	Berlin	1.3			0.3	1.0										
FhI for Telecommunications, Heinrich Hertz Institute (HHI)	Berlin	1.3							0.1						1.2	
Berlin-Brandenburg Academy of Sciences (BBAW)	Berlin	0.9	0.9													
MPI for Human Development	Berlin	0.8		0.8												
German Heart Institute Berlin (DHZB)	Berlin	0.8				0.8										
Institute for Zoo and Wildlife Research (IZW)	Berlin	0.7			0.4		0.3									
Social Science Research Centre Berlin (WZB)	Berlin	0.5		0.5												
MPI for the History of Science	Berlin	0.5	0.5													
Federal Institute for Materials Research and Testing (BAM)	Berlin[1)]	3.8				0.1		0.7				0.6	0.3	1.4	0.3	0.6
German Archaeological Institute (DAI)	Berlin[1)]	3.8	3.8													
Robert Koch Institute (RKI)	Berlin[1)]	1.6			0.1	1.5	0.04									
Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB)	Berlin[1)]	1.3			0.1	0.1	0.1				1.0					
Center of Advanced European Studies and Research (CAESAR)	Bonn	0.5							0.3	0.2						
MPI for Radio Astronomy	Bonn[1)]	0.7							0.4						0.2	
Leibniz Centre for Medicine and Biosciences, Research Centre Borstel (FZB)	Borstel	6.6			1.3	5.1		0.2								
Bremen Institute for Applied Beam Technology (BIAS)	Bremen	3.5										2.4		0.3	0.8	

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Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
MPI for Marine Microbiology	Bremen	1.6			0.2	0.4					1.0		0.1			
Foundation Institute for Materials Engineering (IWT)	Bremen	1.0				0.1		0.03			0.005	0.5	0.1	0.3		
Center for Tropical Marine Ecology (ZMT)	Bremen	0.7									0.7					
FhI for Manufacturing Technology and Applied Materials Research (IFAM)	Bremen[1)]	0.5						0.1					0.01	0.4		
Alfred Wegener Institute for Polar and Marine Research (AWI)	Bremerhaven[1)]	3.6			0.3	0.03					3.3					
Society for Biotechnological Research (GBF)	Brunswick	4.8			1.2	2.7							1.0			
FhI for Surface Engineering and Thin Films (IST)	Brunswick	0.5										0.5				
Physikalisch-Technische Bundesanstalt (PTB)	Brunswick[1)]	4.0				0.1			1.9			0.1	0.5		1.4	
Federal Agricultural Research Centre (FAL)	Brunswick[1)]	1.9			0.1	0.4	1.4						0.1			
FhI for Machine Tools and Forming Technology (IWU)	Chemnitz[1)]	1.2										1.0		0.3		
MPI for Plant Breeding Research	Cologne	2.9			2.9											
German Aerospace Centre (DLR)	Cologne[1)]	7.9				0.1			0.05	0.001	1.5	0.4	1.7	2.7	1.5	
MPI for Molecular Physiology	Dortmund	2.7			2.3	0.03		0.2	0.1							
Leibniz Research Centre for Working Environment and Human Factors (IfADo)	Dortmund	0.9		0.8	0.1											
Institute for Analytic Sciences (ISAS)	Dortmund[1)]	0.7			0.1			0.5	0.1							
FhI for Material Flow and Logistics (IML)	Dortmund[1)]	0.6										0.6				
Leibniz Institute for Solid State and Materials Research (IFW)	Dresden	6.1						0.3	3.4			0.1		2.0	0.3	
Leibniz Institute of Polymer Research (IPF)	Dresden	4.6			0.1			3.0	0.7			0.5	0.2	0.1		
Research Centre Rossendorf (FZR)	Dresden	2.5			0.1	0.1		0.1	0.6		0.4		0.9	0.2		
MPI for Molecular Cellular Biology and Genetics	Dresden	2.0			1.8	0.1			0.1							
MPI for the Chemical Physics of Solids	Dresden	0.7						0.1	0.6							
MPI for the Physics of Complex Systems	Dresden	0.5						0.05	0.3	0.1			0.1			
FhI for Material and Beam Technology (IWS)	Dresden[1)]	0.7										0.6		0.1		
Research Institute for the Biology of Farm Animals (FBN)	Dummerstorf	1.5					1.5									
MPI for Iron Research	Düsseldorf	4.3							0.1			2.2	0.1	1.8	0.1	
German Diabetes Centre, Leibniz Centre for Diabetes Research (DDZ)	Düsseldorf	1.0			0.1	0.9										
North Rhine-Westphalia Science Centre	Düsseldorf	0.5	0.1	0.4												
Research Centre Karlsruhe (FZK)	Eggenstein-Leopoldshafen[1)]	6.6			1.3	0.3	0.6	0.7	0.5			0.4	0.5	1.3	0.9	0.1
FhI for Integrated Circuits (IIS)	Erlangen[1)]	0.8													0.8	
Department for Historical Monuments of Baden-Württemberg (LAD)	Esslingen	2.0	2.0													
MPI for Brain Research	Frankfurt/Main	2.5			1.8	0.7										
MPI of Biophysics	Frankfurt/Main	2.1			2.1	0.1										
Institute of Social Research (IfS)	Frankfurt/Main	1.3		1.3												
Freies Deutsches Hochstift at the Goethe Museum	Frankfurt/Main	1.2	1.2													
Peace Research Institute (HSFK)	Frankfurt/Main	1.1		1.1												
Institute for Biomedical Research, Georg Speyer Haus	Frankfurt/Main	1.1			0.5	0.6										
Society for Chemical Engineering and Biotechnology (DECHEMA)	Frankfurt/Main	0.6						0.2					0.1	0.3		
Senckenberg Research Institute and Natural Museum (FIS)	Frankfurt/Main[1)]	1.6			0.4						1.3					

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Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
German Institute for International Educational Research (DIPF)	Frankfurt/Main[1)]	0.7		0.7												
MPI of Immunobiology	Freiburg	3.1			0.9	2.1										
Tumour Biology Centre Freiburg (KTB)	Freiburg	1.1				1.1		0.1								
Kiepenheuer Institute for Solar Physics (KIS)	Freiburg	0.8							0.8							
FhI for Mechanics of Materials (IWM)	Freiburg[1)]	1.4					0.1		0.03			0.4		0.8		
MPI of Quantum Optics	Garching	1.8						0.1	1.7							
MPI for Astrophysics	Garching	0.8						0.1	0.8							
Institute for Plant Genetics and Crop Plant Research (IPK)	Gatersleben[1)]	3.5			3.0		0.5									
Research Centre Geesthacht (GKSS)	Geesthacht[1)]	1.1						0.1			0.1			0.9		
MPI of Colloids and Interfaces	Golm	3.1			0.1			2.2	0.5				0.2			
MPI for Molecular Plant Physiology	Golm	2.2			2.0		0.2									
MPI for Gravitational Physics, Albert Einstein Institute	Golm[1)]	2.3							2.3							
MPI for Biophysical Chemistry	Göttingen	7.1			5.3	1.1		0.6					0.1			
MPI for Experimental Medicine	Göttingen	3.1			1.0	2.1										
German Primate Centre (DPZ)	Göttingen	1.8			1.1	0.5	0.3									
MPI for Dynamics and Self-organization	Göttingen	1.6						0.9	0.8							
Leibniz Institute for Plant Biochemistry (IPB)	Halle	2.1			2.0			0.1								
MPI of Microstructure Physics	Halle	1.8			0.3			0.1	1.3					0.3		
Bernhard Nocht Institute for Tropical Medicine (BNI)	Hamburg	2.0			0.2	1.8										
Heinrich-Pette-Institute for Experimental Virology and Immunology (HPI)	Hamburg	1.6			0.2	1.4										
Max Planck Unit for Structural Molecular Biology at DESY	Hamburg	1.5			0.9	0.6										
MPI for Comparative and International Private Law	Hamburg	0.8		0.8												
German Institute of Global and Area Studies (GIGA)	Hamburg	0.7	0.05	0.7							0.01					
MPI for Meteorology	Hamburg	0.7			0.1						0.6					
Institute for Safety and Prevention Research (ISIP)	Hamburg	0.6		0.6												
German Electron Synchrotron (DESY)	Hamburg[1)]	1.1			0.01				1.1							
Laser Centre Hannover (LZH)	Hannover	3.2				0.2			0.9			1.9	0.1	0.2		
Institute for Integrated Production Hannover (IPH)	Hannover	1.4										1.4				
Federal Institute for Geosciences and Natural Resources (BGR)	Hannover[1)]	1.7									1.7					
German Cancer Research Centre (DKFZ)	Heidelberg	12.9			6.3	6.3	0.1	0.1							0.1	
MPI for Astronomy	Heidelberg	1.0						0.2	0.9							
German Centre for Research on Ageing (DZFA)	Heidelberg	0.8		0.1		0.6									0.04	
MPI for Nuclear Physics	Heidelberg	0.7							0.7		0.1					
European Laboratory for Molecular Biology (EMBL)	Heidelberg[1)]	4.7			3.5	1.0		0.1							0.2	
MPI for Medical Research	Heidelberg[1)]	3.8			2.0	1.8										
Friedrich-Loeffler-Institute, Federal Research Institute for Animal Health (FLI)	Island of Riems[1)]	0.9					0.9									
MPI for Chemical Ecology	Jena	1.5			1.2		0.1	0.2								
Leibniz Institute for Natural Product Research and Infection Biology (HKI)	Jena	1.4			0.3	1.0		0.1								

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Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Leibniz Institute for Age Research, Fritz Lipmann Institute (FLI)	Jena	1.4			1.3	0.1										
Institute for Physical High Technology (IPHT)	Jena	0.9							0.2				0.6	0.1		
MPI for Biogeochemistry	Jena	0.6			0.3		0.2				0.2					
Research Centre Jülich (FZJ)	Jülich	9.9			1.9	2.2	0.1	0.7	1.9	0.01	0.2		0.7	1.8	0.4	
Institute for Composite Materials (IVW)	Kaiserslautern	3.2						2.3				0.9				
German Research Centre for Artificial Intelligence (DFKI)	Kaiserslautern[1)]	0.7													0.7	
FhI for Information and Data Processing (IITB)	Karlsruhe[1)]	0.6		0.1											0.5	
MPI for Solar System Research	Katlenburg-Lindau	0.9							0.2		0.6					
Leibniz Institute of Marine Sciences (IFM-GEOMAR)	Kiel	18.9			0.8	0.1					17.9					
Leibniz Institute for Science Education (IPN)	Kiel	1.0		1.0												
Paul-Ehrlich-Institute, Federal Agency for Sera and Vaccines (PEI)	Langen	0.7			0.3	0.3		0.1								
Leibniz Institute for Tropospheric Research (IfT)	Leipzig	2.5									2.5					
Leibniz Institute of Surface Modification (IOM)	Leipzig	1.4							0.3			0.1	0.1	0.1	0.9	
MPI for Mathematics in the Sciences	Leipzig	1.2							0.05	1.2						
MPI for Human Cognitive and Brain Sciences	Leipzig[1)]	1.5	0.1	1.0	0.1	0.3										
Centre for Environmental Research Leipzig-Halle (UFZ)	Leipzig[1)]	1.3			0.1		0.4	0.1			0.6		0.1			
Leibniz Institute for Neurobiology (IfN)	Magdeburg	1.9			1.1	0.8										
MPI for Polymer Research	Mainz	3.7						2.0	1.2				0.4		0.1	
MPI for Chemistry	Mainz	1.0									1.0					
Department for Historical Monuments of Rhineland-Palatinate (LAD)	Mainz[1)]	0.6	0.6													
Central Institute of Mental Health	Mannheim	2.6		0.1	0.2	2.3										
Centre for European Economic Research (ZEW)	Mannheim	1.1		1.1												
Germany Literary Archive Marbach	Marbach	0.6	0.6													
MPI for Terrestrial Microbiology	Marburg	1.5			0.5	0.6	0.3									
MPI for Neurobiology	Martinsried	2.2			0.7	1.5										
MPI for Biochemistry	Martinsried[1)]	13.0			10.4	2.3		0.1	0.2							
MPI for Coal Research	Mülheim/Ruhr	3.0			0.1			2.7	0.1				0.1			
MPI for Bioinorganic Chemistry	Mülheim/Ruhr	1.1			0.5	0.1		0.5								
Leibniz Centre for Agricultural Landscape Research (ZALF)	Müncheberg[1)]	0.8			0.04		0.8									
Bavarian Academy of Sciences	Munich	2.0	0.4						1.3		0.1			0.3		
MPI for Psychiatry	Munich	1.7		0.3	0.2	1.2										
MPI for Physics, Werner Heisenberg Institute	Munich	1.1							1.1							
Bavarian Natural History Collections	Munich	1.1			0.6						0.5					
Munich Municipal Hospital	Munich	0.7		0.1	0.1	0.5										
Institute for Social Research (ISF)	Munich	0.5		0.5												
Institute for Diabetes Research (IFDF)	Munich	0.5				0.5										

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Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
German Museum (DM)	Munich[1)]	0.7	0.7													
Institute of Contemporary History (IfZ)	Munich[1)]	0.6	0.6													
Research Centre for Environment and Health (GSF)	Neuherberg[1)]	6.9			3.0	3.1	0.2	0.1			0.2				0.2	
Regional Authority for viniculture and horticulture of Rhenish Palatinate	Neustadt	0.6				0.1	0.6									
National Research Centre for Geosciences (GFZ)	Potsdam	6.7									6.7					
Astrophysical Institute Potsdam (AIP)	Potsdam	1.5							1.4		0.1					
Potsdam Institute for Climate Impact Research (PIK)	Potsdam	0.8							0.4		0.3		0.1			
Baltic Sea Research Institute Warnemünde (IOW)	Rostock	1.5			0.05						1.4					
Leibniz Institute for Catalysis (LIKAT)	Rostock[1)]	1.0						0.7					0.3	0.1		
MPI for Informatics	Saarbrücken	2.8				0.1		0.1							2.6	
FhI for Non-Destructive Testing (IZFP)	Saarbrücken[1)]	0.6				0.1		0.05	0.1			0.1		0.1	0.1	0.2
Mecklenburg-Western Pomerania Regional Authority for Culture and the Preservation of Monuments and Historic Buildings	Schwerin	0.7	0.7													
MPI for Ornithology	Seewiesen[1)]	0.5			0.5											
MPI for Solid State Research	Stuttgart	3.1						0.3	2.6				0.1		0.1	
MPI for Metals Research	Stuttgart	1.3						0.1	0.7					0.5		
Dr. Margarete Fischer Bosch Institute for Clinical Pharmacology (IKP)	Stuttgart	0.5	0.1			0.4										
MPI for Developmental Biology	Tübingen	1.9			1.8	0.1										
Knowledge Media Research Centre (IWM)	Tübingen	1.0		1.0												
MPI for Biological Cybernetics	Tübingen	0.6		0.02	0.1	0.2									0.3	
Foundation of Weimar Classics	Weimar	0.7	0.7													
Herzog August Library (HAB)	Wolfenbüttel	0.8	0.8													
Report subtotal[2)]		**364.2**	**15.6**	**15.7**	**83.8**	**64.9**	**8.5**	**25.3**	**39.2**	**6.9**	**44.0**	**16.7**	**8.9**	**18.3**	**15.5**	**0.8**
Other institutions		**40.2**	**9.6**	**3.1**	**3.0**	**6.3**	**2.0**	**1.2**	**2.4**	**0.2**	**3.1**	**2.1**	**2.3**	**1.4**	**2.6**	**0.6**
Overall total		**404.3**	**25.2**	**18.8**	**86.7**	**71.2**	**10.6**	**26.5**	**41.6**	**7.1**	**47.2**	**18.8**	**11.2**	**19.7**	**18.1**	**1.5**
Based on: N institutions		**411**	**96**	**50**	**89**	**108**	**31**	**63**	**59**	**10**	**56**	**36**	**42**	**40**	**47**	**10**

>> See page 135 for the abbreviation key

[1)] and other locations

[2)] Only institutions that received more than €0.5 million in DFG funding between 2002 and 2004.

>> Sorted by headquarters

Table A-15:
Funding profile of the 40 higher education institutions with the highest DFG funding volumes, based on direct R&D project funding by the German government between 2002 and 2004 (in million euros)

Higher education institution	Total	BIO	MED	LEB	PCT	SDE	GEO	ASR	ENE	MAT	INF	STM	Further funding areas
Munich TU	60.7	8.2	2.4	17.0	0.7	6.1	1.6	1.8	4.9	1.5	10.1	1.4	5.1
Aachen TH	54.4	2.7	3.8	10.4	1.1	4.9	0.1	5.2	4.3	2.1	7.9	4.5	7.4
Stuttgart U	45.1	3.9		0.3	4.1	7.1	0.8	1.7	12.4	0.3	6.7	2.4	5.3
Dresden TU	44.2	1.0	4.3	2.6	0.7	13.0	0.1	1.3	4.1	3.2	5.2	3.2	5.5
Munich U	43.2	12.0	12.9	6.3	1.1	4.8	0.3	0.1	0.03	1.5	3.3		0.8
Heidelberg U	39.6	8.6	7.6	13.3	1.6	3.7		2.4	0.1	1.6	0.4		0.3
Bonn U	37.6	6.9	5.5	7.0	0.1	12.2	1.3	2.3		0.1	1.1	0.5	0.6
Bremen U	34.5	1.8	0.3	0.2	0.1	8.6	6.3	9.9	3.2	0.2	2.5	0.4	0.9
Hamburg U	34.4	4.8	3.7	6.0	1.3	10.3	4.1	1.0		1.2	0.6	0.2	1.2
Cologne U	34.3	5.6	10.5	2.2	1.6	7.4		3.5	0.5	0.8	0.5	0.5	1.1
Berlin FU	34.3	10.6	13.1	1.4	0.4	3.7	0.6	2.2		1.0	0.4	0.1	0.8
Berlin TU	33.4	2.0	0.9	0.9	1.0	8.9	1.6	1.8	1.7	1.1	8.4	3.6	1.6
Karlsruhe TH	32.8	1.0		4.8	1.2	6.6	0.4	0.3	2.5	1.5	10.0	2.8	1.7
Berlin HU	30.8	10.9	13.2	2.8	0.8	0.01		0.6		0.5	1.1		1.0
Bochum U	30.1	5.3	7.5	5.0	1.8	1.3		1.5	1.5	0.5	4.1	0.8	0.7
Göttingen U	28.9	14.5	3.8	3.2	0.4	4.7	0.6	0.3	0.3		0.5		0.5
Freiburg U	27.2	4.5	9.2	5.5	2.3	2.1	0.04	0.6	0.03	0.2	2.2		0.3
Kiel U	27.1	10.7	3.7	1.3		3.2	3.8	2.0	0.5	0.3	1.0		0.7
Erlangen-Nuremberg U	26.4	3.6	5.6	4.2	0.8	0.2		1.2	1.5	3.2	4.4	0.3	1.3
Würzburg U	26.1	13.9	3.9	2.5	1.2	2.4	0.4	0.3	0.03	0.05	1.3		
Mainz U	26.1	1.8	3.3	7.2	0.1	4.4	1.0	2.0	0.3	0.1	1.1		4.8
Tübingen U	26.0	7.4	7.3	1.4	0.6	3.4		2.1		0.4	3.2	0.02	0.1
Münster U	22.6	3.2	9.2	1.9	2.6	1.6	0.4	1.5		0.4	1.0		0.8
Hannover U	20.4	0.4	0.1	0.3	0.3	1.9	2.5	0.7	4.0	0.9	3.5	0.9	4.9
Brunswick TU	19.5	1.4		0.3	1.7	2.0	0.3	4.1	1.8	0.3	4.8	0.8	2.0
Marburg U	18.8	5.8	9.1	0.4	0.4	0.6		0.3	0.03	0.8	0.9		0.5
Leipzig U	18.4	0.8	8.8	0.5	0.3	1.3	0.4			1.2	1.0	0.3	3.8
Jena U	18.3	1.7	6.1	0.4	4.4	0.9		0.6	1.3	0.2	1.0		1.8
Darmstadt TU	18.2	0.03		4.8	1.4	1.5	0.2	0.6	2.9	1.3	3.4	1.0	1.0
Bielefeld U	18.0	9.6	0.4	0.7	1.2	0.4				0.1	1.2		4.4
Halle-Wittenberg U	17.3	2.8	6.1	0.4		2.7		0.1		0.5	1.2		3.5
Ulm U	16.5	1.7	8.7	0.3	1.2	0.7		0.7		1.7	1.3		0.4
Duisburg-Essen U	15.7	1.8	2.6	0.4	0.4	2.6	0.1	0.2	0.4	0.9	2.9	0.6	2.8
Giessen U	15.2	6.5	1.0	2.7	0.4	2.1		0.6	0.1		1.4		0.4
Düsseldorf U	14.8	2.8	9.1	0.3	0.6	0.2	0.2	0.3	0.3	0.9			0.1
Frankfurt/Main U	13.8	2.4	2.6	3.9	2.6	0.8		0.6		0.2	0.6	0.1	0.2
Dortmund U	11.0			2.6	0.4	1.1			0.1	1.2	2.4	1.6	1.7
Saarbrücken U	9.5	1.3	0.7	1.5	0.5	0.2		0.1	0.6	1.5	1.1		2.0
Regensburg U	8.2	0.5	1.9	0.3	0.1	0.4	0.1				1.9	0.1	3.0
Constance U	3.5	0.4	0.2	0.4				0.01	2.1				0.5
Report subtotal[1)]	**1,056.8**	**184.7**	**189.3**	**127.4**	**41.5**	**140.3**	**27.5**	**54.3**	**51.7**	**33.2**	**105.5**	**26.1**	**75.3**
Other HEIs	**302.3**	**8.0**	**35.9**	**12.6**	**17.7**	**47.6**	**12.2**	**7.9**	**23.9**	**10.8**	**37.7**	**7.8**	**80.3**
HEIs in total	**1,359.1**	**192.7**	**225.2**	**139.9**	**59.2**	**187.9**	**39.7**	**62.2**	**75.6**	**43.9**	**143.2**	**34.0**	**155.6**
Based on: N HEIs	**186**	**62**	**49**	**68**	**61**	**84**	**40**	**56**	**63**	**57**	**83**	**47**	**166**

>> See page 135 for the abbreviation key

[1)] The study is based on the 40 higher education institutions with the highest DFG funding volumes from 2002 to 2004.

Source:

Federal Ministry of Education and Research (BMBF): Direct R&D project funding by higher education institution and funding priority (based on PROFI project database; 2002 to 2004).

Calculated by the DFG.

Table A-16:
Funding profile of the 40 higher education institutions with the highest DFG funding volumes, based on participation in the Sixth EU's Framework Programme (in million euros)

Higher education institution	Total	CGK	LGB	FQS	SGE	ANS	NAN	IST	Further funding areas
Stuttgart U	34.6		1.8	0.4	9.7	2.2	4.8	7.1	8.5
Munich U	28.5	0.1	12.2	5.2	0.9		1.3	2.7	6.1
Munich TU	28.5		5.3	4.4	1.7	2.0	5.0	3.3	6.9
Aachen TH	27.2		0.8	0.2	4.9	2.2	6.7	8.1	4.3
Heidelberg U	25.7	0.2	11.5		1.8		1.2	2.7	8.2
Tübingen U	25.2	0.2	13.7	0.5	2.2		0.2	1.6	6.8
Karlsruhe TH	22.0		0.3		0.8	3.9	2.2	12.4	2.4
Frankfurt/Main U	15.7	0.1	8.7	0.3	0.6		1.0	1.7	3.4
Göttingen U	14.3	0.02	6.7	1.1	2.8		0.2	0.3	3.2
Freiburg U	13.9	0.03	6.6		0.1	0.2	0.7	4.3	2.0
Mainz U	13.5	0.4	2.1	1.3	0.2		1.2	2.0	6.4
Bonn U	13.2	0.1	4.1	0.9	1.2	0.1	0.01	1.0	5.8
Bochum U	13.2		2.5				1.4	4.3	5.0
Dresden TU	12.9		2.7		1.8	1.1	0.3	5.4	1.6
Berlin TU	12.5		0.4	0.05	2.5	1.3	0.9	4.8	2.5
Berlin FU	11.9	1.2	3.7	1.4	1.0		0.7	1.1	2.9
Darmstadt TU	11.7	0.8	0.7		0.5	1.3	2.5	4.3	1.7
Berlin HU	11.7	0.1	3.6	1.4	0.6		1.1	0.3	4.6
Hamburg U	11.6	0.2	3.6		1.4	0.2	1.0	0.8	4.4
Cologne U	11.0	0.4	7.3		0.5		0.5	0.4	2.0
Hannover U	10.9	0.2	0.2	0.2	1.5	1.8	3.2	2.1	1.7
Saarbrücken U	10.4		2.4			1.1	3.2	2.9	0.7
Bremen U	9.3	0.6			2.7	0.2	1.2	3.8	0.8
Giessen U	9.1	0.3	5.7	0.02	0.02		0.5		2.6
Münster U	8.9	0.1	2.8	0.1			2.6	0.3	2.9
Erlangen-Nuremberg U	8.4		1.5	0.1	1.6		0.3	1.6	3.4
Würzburg U	7.3		4.0				0.7	1.8	0.9
Ulm U	6.9		2.2				1.9	0.9	1.8
Duisburg-Essen U	6.4	0.1	0.9		0.5		0.4	1.8	2.7
Bielefeld U	5.7	2.0	0.2	1.0				1.5	1.0
Marburg U	5.5	0.2	3.3	0.2	0.3			0.2	1.3
Düsseldorf U	5.4		1.6	0.4			0.7	0.6	2.2
Leipzig U	5.2		0.3	0.2			2.0	1.2	1.6
Dortmund U	5.2	0.5			0.5		2.6	0.5	1.0
Constance U	5.0	0.8	1.1	0.2	2.0		0.2		0.8
Jena U	5.0	0.1	0.8	0.2	0.1		1.0	0.2	2.5
Kiel U	5.0		1.1	0.01	0.3		0.2	1.6	1.8
Brunswick TU	4.1		0.4		0.9	1.1	0.1	1.6	0.1
Regensburg U	2.8		1.0		0.04				1.8
Halle-Wittenberg U	1.6		1.3		0.2				0.004
Report subtotal[1)]	**487.1**	**8.7**	**129.4**	**19.9**	**45.8**	**18.6**	**53.3**	**90.9**	**120.6**
Other HEIs	**87.8**	**4.7**	**12.4**	**3.3**	**12.1**	**4.0**	**6.7**	**21.4**	**23.1**
HEIs in total	**574.9**	**13.3**	**141.8**	**23.2**	**57.9**	**22.6**	**60.0**	**112.3**	**143.7**
Based on: N HEIs	**98**	**32**	**48**	**30**	**52**	**23**	**51**	**65**	**80**

>> See page 135 for the abbreviation key

[1)] The study is based on the 40 higher education institutions with the highest DFG funding volumes from 2002 to 2004.

Source:

EU Office of the BMBF: German participation in FP6 by higher education institution and thematic priority (as of 24 January 2006). Calculated by the DFG.

Table A-17:
DFG review board members by higher education institution and scientific discipline (election period 2004 to 2007)

Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences
Berlin HU	26	7	13	6	
Dresden TU	26	3	4	5	14
Freiburg U	21	6	13	1	1
Aachen TH	17		4	3	10
Tübingen U	17	8	8	1	
Berlin FU	16	8	7	1	
Münster U	16	6	7	3	
Erlangen-Nuremberg U	14	3	3	4	4
Göttingen U	14	4	5	4	1
Cologne U	13	6	5	2	
Munich U	12	4	6	2	
Würzburg U	12	5	7		
Munich TU	12		5	3	4
Bonn U	12	2	7	3	
Bochum U	12	2	4	3	3
Hamburg U	12	6	5	1	
Darmstadt TU	12		2	2	8
Magdeburg U	11	1	4	1	5
Heidelberg U	10	4	4	2	
Hannover U	10		1	4	5
Brunswick TU	10	1	2	2	5
Leipzig U	10	4	5	1	
Mainz U	9	3	3	3	
Berlin TU	9	1	1	3	4
Giessen U	9	1	6	2	
Marburg U	9	2	5	2	
Halle-Wittenberg U	9	2	4	2	1
Stuttgart U	8			1	7
Jena U	8	5	1	1	1
Bayreuth U	7	2	3	2	
Frankfurt/Main U	6	2	3	1	
Kiel U	6	1	5		
Chemnitz TU	6	1		2	3
Dortmund U	5	1		2	2
Ulm U	5		3		2
Constance U	5	4		1	
Kaiserslautern TU	5		2		3
Potsdam U	5	2		3	
Mannheim U	5	4	1		
Greifswald U	5	1	4		
Karlsruhe TH	4			2	2
Düsseldorf U	4	1	2	1	
Regensburg U	4	2	1	1	
Bielefeld U	4		2	2	
Bremen U	3	1			2
Saarbrücken U	3	1	2		
Hannover MedH	3		3		
Hohenheim U	3	1	2		
Oldenburg U	3		3		
Lübeck U	3		3		
Freiberg TU	3				3
Siegen U	3	1		1	1
Kassel U	3	1	1		1
Hannover TiHo	3		3		
Duisburg-Essen U	2	1	1		
Osnabrück U	2		2		

>> Continued on next page

Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences
Rostock U	2		1	1	
Weimar U	2				2
Paderborn U	1				1
Clausthal TU	1				1
Augsburg U	1			1	
Hamburg-Harburg TU	1				1
Trier U	1	1			
Ilmenau TU	1				1
Wuppertal U	1	1			
Cottbus TU	1			1	
Munich UdBW	1	1			
Hamburg UdBW	1				1
Erfurt U	1	1			
Hagen FernU	1	1			
Eichstätt-Ingolstadt KathU	1	1			
HEIs in total	**503**	**127**	**188**	**89**	**99**
Based on: N HEIs	**71**	**47**	**48**	**42**	**30**

Table A-18:
DFG review board members by non-university research institution and scientific discipline (election period 2004 to 2007)

Institution	Headquarter	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences
Institute of Plastics Processing (IKV)	Aachen	1				1
Kerckhoff Clinic GmbH	Bad Nauheim	1		1		
Fritz Haber Institute of the Max Planck Society	Berlin	1			1	
Leibniz Institute for Molecular Pharmacology (FMP)	Berlin	1		1		
Max Delbrück Centre for Molecular Medicine (MDC)	Berlin	1		1		
Social Science Research Centre Berlin (WZB)	Berlin	1	1			
Federal Institute for Materials Research and Testing (BAM)	Berlin[1)]	1				1
German Archaeological Institute (DAI)	Berlin[1)]	1	1			
Leibniz Centre for Medicine and Biosciences, Research Centre Borstel (FZB)	Borstel	1		1		
MPI for Marine Microbiology	Bremen					
Alfred Wegener Institute for Polar and Marine Research (AWI)	Bremerhaven[1)]	1			1	
Federal Agricultural Research Centre (FAL)	Brunswick[1)]	1		1		
Physikalisch-Technische Bundesanstalt (PTB)	Brunswick[1)]	2		1	1	
FhI for Machine Tools and Forming Technology (IWU)	Chemnitz[1)]	1				1
German Aerospace Centre (DLR)	Cologne[1)]	2			1	1
Federal Environment Agency (UBA)	Dessau	1			1	
MPI for Molecular Physiology	Dortmund	1		1		
FhI for Material Flow and Logistics (IML)	Dortmund[1)]	1				1
Leibniz Institute of Polymer Research (IPF)	Dresden	3			2	1
MPI for the Physics of Complex Systems	Dresden	1			1	
Research Institute for the Biology of Farm Animals (FBN)	Dummerstorf	2		2		
Research Centre Geesthacht (GKSS)	Geesthacht[1)]	1				1
MPI of Colloids and Interfaces	Golm	1			1	
MPI for Molecular Plant Physiology	Golm	1		1		
MPI for Biophysical Chemistry	Göttingen	4		4		
MPI for Experimental Medicine	Göttingen	1		1		
Institute of Vegetable and Ornamental Crops (IGZ)	Großbeeren[1)]	1		1		
Leibniz Institute for Plant Biochemistry (IPB)	Halle	1		1		
MPI of Microstructure Physics	Halle	1			1	
MPI for Comparative and International Private Law	Hamburg	1	1			
German Electron Synchrotron (DESY)	Hamburg[1)]	1			1	
German Cancer Research Centre (DKFZ)	Heidelberg	5		5		
MPI for Astronomy	Heidelberg	1			1	
MPI for Nuclear Physics	Heidelberg	1			1	
European Laboratory for Molecular Biology (EMBL)	Heidelberg[1)]	1		1		
Leibniz Institute for Age Research, Fritz Lipmann Institute (FLI)	Jena	1		1		
MPI for Chemical Ecology	Jena	1			1	
Research Centre Jülich (FZJ)	Jülich	2			1	1
Leibniz Institute of Marine Sciences (IFM-GEOMAR)	Kiel	1			1	
Leibniz Institute of Atmospheric Physics (IAP)	Kühlungsborn[1)]	1			1	
Leibniz Institute of Surface Modification (IOM)	Leipzig	1			1	
Leibniz Institute for Tropospheric Research (IfT)	Leipzig	1			1	
Leibniz Institute for Neurobiology (IfN)	Magdeburg	1		1		
Central Institute of Mental Health	Mannheim	2		2		
MPI for Terrestrial Microbiology	Marburg	1		1		
MPI for Neurobiology	Martinsried	1		1		
MPI for Biochemistry	Martinsried[1)]	2		2		
MPI for Coal Research	Mülheim/Ruhr	1			1	
MPI for Bioinorganic Chemistry	Mülheim/Ruhr	1			1	
Research Centre for Environment and Health (GSF)	Neuherberg[1)]	1		1		
National Research Centre for Geosciences (GFZ)	Potsdam	3			3	
Federal Centre for Breeding Research on Cultivated Plants (BAZ)	Quedlinburg[1)]	1		1		
MPI for Art History - Bibliotheca Hertziana	Rom	1	1			
MPI for Informatics	Saarbrücken	1				1
FhI for Silicate Research (ISC)	Würzburg[1)]	1				1
Total		**72**	**4**	**34**	**24**	**10**
Based on: N institutions		**55**	**4**	**24**	**21**	**10**

[1)] and other locations

>> Sorted by headquarters

Table A-19:
DFG reviewers from 2002 to 2004 by higher education institution and research area[1)]

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Munich U	317	63.1	45.2	40.1	92.4	12.4	12.4	20.5	6.7	18.0			1.3	4.9	
Heidelberg U	250	40.3	22.0	27.0	89.0	2.3	14.5	22.4	12.0	14.0		1.0	1.0	4.1	0.5
Tübingen U	250	72.1	21.0	24.1	76.2	2.8	12.0	11.5	5.5	17.4	0.1	0.1	3.5	3.7	0.2
Bonn U	250	39.1	21.6	21.3	58.9	20.6	10.7	21.2	15.8	27.6	1.0	2.0		9.3	1.0
Munich TU	248	4.3	3.2	17.1	51.9	27.9	22.8	17.9	7.6	7.5	9.5	14.4	5.6	36.6	21.8
Freiburg U	239	45.1	21.6	24.4	74.6	7.3	13.5	11.7	8.4	12.6	0.5	1.4	0.3	16.2	1.4
Erlangen-Nuremberg	237	29.7	17.5	13.7	68.1	3.7	9.8	19.6	8.1	10.9	6.2	9.8	16.4	23.3	0.4
Berlin FU	232	62.6	25.4	22.1	58.2	10.1	12.0	10.4	6.9	16.0	0.1	1.1	0.6	2.9	3.6
Göttingen U	219	39.5	19.7	23.7	48.3	29.8	11.3	16.5	6.6	15.3	0.4	1.8	5.5	0.8	
Berlin HU	216	49.7	32.7	18.9	56.5	10.8	3.9	9.6	7.5	15.5	1.1		1.6	6.2	2.0
Hamburg U	207	43.0	28.9	16.8	52.6	3.3	12.2	16.1	5.7	18.8	1.1	0.3	1.0	5.2	2.1
Münster U	202	48.4	16.1	19.4	54.5	2.6	12.2	15.0	9.0	11.7	1.0	0.2	5.9	4.0	2.0
Cologne U	196	45.2	30.4	21.5	46.0	2.2	11.2	13.9	4.3	16.1		1.5	0.2	2.0	1.7
Aachen TH	194	2.0	6.5	4.6	33.9	3.8	12.1	13.6	10.6	10.6	19.1	19.6	13.4	29.1	15.1
Bochum U	192	32.6	10.5	16.2	29.9	2.3	11.0	16.1	6.8	12.8	6.5	9.9	5.8	17.8	13.6
Würzburg U	179	17.0	9.7	29.2	72.8	2.3	9.6	16.8	4.0	11.2		0.1	1.9	4.4	0.2
Frankfurt/Main U	174	32.0	26.1	25.9	43.0	0.3	8.5	12.6	5.4	14.1	1.0			5.1	
Mainz U	168	29.2	15.3	14.6	56.2	0.9	11.3	13.9	7.6	13.9	1.0		2.0	2.1	
Karlsruhe TH	151	5.0	4.0	8.9	5.9	2.0	12.3	9.4	3.4	18.3	6.0	16.1	8.9	36.7	14.0
Dresden TU	148	10.5	10.2	5.1	23.1	6.1	9.3	8.7	4.0	6.0	12.1	7.3	11.0	21.3	13.4
Berlin TU	141	15.5	7.6	1.9	4.1	6.7	9.8	13.2	8.3	10.1	10.2	11.5	6.1	21.6	14.3
Stuttgart U	139	5.4	4.8	7.2	4.4	2.5	13.9	12.8	4.2	7.0	19.1	16.8	3.8	18.2	19.0
Duisburg-Essen U	138	6.3	8.8	6.4	37.4	1.0	8.5	16.4	10.4	6.3	4.9	12.2	1.9	11.5	6.1
Kiel U	138	19.8	12.4	6.4	36.0	15.4	5.2	9.6	5.2	15.7		0.1	1.3	9.6	0.8
Marburg U	132	27.6	10.5	17.5	41.0	5.2	13.1	7.5	0.3	5.5	0.5	1.0		0.3	2.0
Giessen U	131	11.2	10.5	19.8	36.4	24.3	4.2	8.8	4.0	7.7			1.0	3.1	0.1
Düsseldorf U	123	17.8	8.4	17.3	50.6	3.1	8.8	7.0	6.1			0.4	0.8	1.7	1.0
Darmstadt TU	120	4.5	4.3	8.6	1.5	0.4	12.6	8.5	7.8	8.4	12.5	11.1	8.9	19.5	11.5
Jena U	117	24.0	16.9	13.7	24.9	2.8	5.0	11.0	5.2	7.7	1.5		1.3	2.9	0.1
Regensburg U	114	13.9	14.3	14.9	38.5	2.0	9.4	11.4	2.6	4.8	0.5	1.0		0.1	0.5
Saarbrücken U	112	18.9	10.1	9.7	29.5	1.1	5.2	7.5	4.5	1.0	4.1	1.3	7.0	10.6	1.4
Hannover U	110	7.1	7.3	2.4	3.4	14.1	8.6	7.5	4.0	11.6	12.8	4.9	2.1	15.7	8.5
Ulm U	106	0.6	2.2	10.5	50.2	1.7	9.3	7.8	4.3	1.5		2.2	2.4	13.3	
Halle-Wittenberg U	105	22.8	12.9	14.1	16.3	10.1	5.2	4.9	3.0	3.5	1.6	4.1	2.5	3.5	0.5
Brunswick TU	104	4.6	2.3	7.3	4.9	5.2	4.8	7.8	4.7	6.7	9.1	7.3	8.1	17.8	13.4
Leipzig U	99	17.5	11.2	4.6	33.3	5.8	6.6	4.7	2.0	6.0	0.2	1.0	1.1	2.5	2.5
Dortmund U	92	6.7	14.3	0.4	2.3	0.5	6.7	11.4	4.5	1.0	6.9	9.6	1.4	17.6	8.7
Bielefeld U	88	15.8	20.0	11.4	5.9	1.4	5.1	10.2	11.0	0.5		1.0	0.4	4.4	1.0
Constance U	86	18.4	21.1	11.2	12.5	2.1	5.3	8.3	1.7	2.3		0.1		3.2	0.1
Bayreuth U	80	10.3	3.6	16.1	2.4	5.6	10.9	7.0	4.0	12.7	0.5	2.7	3.9	0.4	
Bremen U	80	9.4	9.6	5.8	9.7		3.6	3.3	6.0	16.2	1.8	2.9	2.3	8.8	0.6
Magdeburg U	74	0.1	10.6	1.4	20.1	0.4	2.6	1.5	6.0	1.0	8.6	8.9	2.5	10.0	0.5
Kaiserslautern TU	72		0.3	5.0	8.4	0.3	5.7	9.2	7.8	1.5	4.3	4.4	2.4	15.3	7.5
Hannover MedH	65	1.0	0.3	8.2	53.8	1.0								0.7	
Potsdam U	59	14.5	14.7	4.6	3.0	0.8	5.0	3.7	2.0	7.2				2.4	1.2
Rostock U	55	4.0	3.5	5.1	12.5	3.0	3.0	4.7	1.0	1.6	1.4	3.2	2.2	7.1	2.7
Paderborn U	51	4.9	1.1	1.0	1.0		2.8	7.1	5.2	1.0	3.2	3.8	4.7	15.2	0.1
Hohenheim U	46	0.1	5.8	3.6	4.8	27.6				3.0		1.0		0.1	
Kassel U	46	1.7	4.3	2.4	0.6	1.4	4.0	5.0		1.0	5.1	2.2	1.9	7.6	9.0
Chemnitz TU	45	4.1	4.7	0.1	0.6		5.5	4.0	5.1	0.02	7.9	1.5	2.9	8.5	0.1
Hamburg-Harburg TU	44		0.5	0.3	1.3	0.1	1.0	0.3	1.0	3.9	6.4	7.3	5.4	10.4	6.2
Trier U	42	18.2	13.7	1.0	2.2				3.0	2.0				1.0	1.0
Freiberg TU	42	1.0	0.7		1.3	0.4			1.3	7.3	3.4	6.6	17.8	0.1	2.3
Clausthal TU	41					0.3	5.7	1.6	2.5	4.0	3.6	6.2	15.4	0.7	1.0
Mannheim U	40	5.3	22.3		0.7	0.4		0.3	4.7	0.2			1.0	5.2	
Wuppertal U	40	4.0	6.0	0.3	1.9	0.2	4.7	4.5	2.0	3.0	0.6	2.3		5.4	5.2
Osnabrück U	38	8.6	6.4	8.6	4.3	0.5		4.8	2.0			0.1	0.3	2.6	

>> Continued on next page

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Greifswald U	38	7.0	6.3	3.6	10.9	1.2	1.0	2.6	3.0	2.0				0.4	
Lübeck U	37		0.1	2.9	27.2	0.1	1.2	1.0						4.0	
Oldenburg U	33	2.3	5.4	2.9	3.7	1.2	4.8	2.2	1.1	2.8	0.5	1.5		4.4	0.4
Siegen U	31	4.6	2.9	0.3	1.0	0.8	2.9	3.0	2.0	1.4		0.7	5.1	5.4	1.0
Augsburg U	30	5.5	5.0		0.2			9.1	5.6		0.1		1.5	3.0	
Bamberg U	29	12.7	10.8		1.0				0.5	1.0	1.0			1.0	1.0
Munich UdBW	26	2.8	4.0	0.5	0.5	0.3		2.0	0.3	4.0	2.0	4.9	0.1	3.0	1.7
Hannover TiHo	22			4.9	4.4	11.3	1.4							0.1	
Cottbus TU	22	1.3	2.5			2.1	1.0	0.5	1.0	3.5	1.0			2.0	7.2
Ilmenau TU	22		3.0		1.5		0.1	0.3			2.0	0.6	3.8	10.6	0.2
Weimar U	19	4.0								0.1	0.4				14.4
Bremen IU	17	1.0	6.0	3.3	1.3	1.0	1.5	2.0	0.8		0.3				
Erfurt U	14	6.3	7.3		0.4										
Passau U	13	6.0	4.0						1.0					2.0	
Hagen FernU	13	4.0	3.9					0.5		0.02				4.5	0.01
Eichstätt-Ingolstadt KathU	12	6.5	2.5						2.0	1.0					
Hamburg UdBW	11	0.9	2.0								6.3	1.0	0.5		0.3
Witten-Herdecke U	9		2.0	1.8	4.2										1.0
Koblenz-Landau U	9	1.8	4.2			1.2								1.8	
Frankfurt/Oder U	6	2.5	3.3			0.2									
Report subtotal[2)]	**7,836**	**1,124.9**	**770.3**	**663.2**	**1,709.5**	**319.9**	**447.9**	**554.0**	**310.2**	**476.8**	**211.1**	**233.7**	**209.7**	**556.0**	**248.9**
Other HEIs	**80**	**21.7**	**15.2**	**1.5**	**2.1**		**0.6**	**2.0**	**0.2**	**0.1**	**4.8**	**5.0**	**3.0**	**8.2**	**15.6**
HEIs in total	**7,916**	**1,146.6**	**785.5**	**664.7**	**1,711.6**	**319.9**	**448.5**	**556.0**	**310.4**	**476.9**	**215.9**	**238.7**	**212.7**	**564.2**	**264.5**
Based on: N HEIs	**136**	**90**	**87**	**64**	**71**	**63**	**61**	**65**	**65**	**64**	**54**	**57**	**54**	**79**	**72**

>> See page 135 for the abbreviation key

[1)] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[2)] Only higher education institutions at which five or more DFG reviewers were employed during the study period from 2002 and 2004 (based on: written reviews).

Table A-20:
DFG reviewers from 2002 to 2004 by non-university research institution and research area[1)]

Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
German Institute of Human Nutrition (DIfE)	Bergholz-Rehbrücke	6			0.4	5.6	0.03									
Max Delbrück Centre for Molecular Medicine (MDC)	Berlin	21			6.2	14.8		0.1								
Social Science Research Centre Berlin (WZB)	Berlin	11	0.2	10.7									0.1			
Prussian Cultural Heritage Foundation	Berlin	8	8.0													0.03
Fritz Haber Institute of the Max Planck Society	Berlin	7						2.4	3.1				1.3	0.2		
MPI for Molecular Genetics	Berlin	7			3.8	2.7	0.2								0.3	
MPI for Infection Biology	Berlin	7			1.0	5.0	1.0									
Hahn Meitner Institute Berlin (HMI)	Berlin	6			0.3				3.7			0.3		0.7	1.0	
German Heart Institute Berlin (DHZB)	Berlin	6			0.3	5.5							0.2			
Weierstrass Institute for Applied Analysis and Stochastics (WIAS)	Berlin	5								4.0		1.0				
MPI for Human Development	Berlin	5	1.0	4.0												
Federal Institute for Materials Research and Testing (BAM)	Berlin[2)]	11						3.0				1.0		4.0	3.0	
German Archaeological Institute (DAI)	Berlin[2)]	9	9.0													
Robert Koch Institute (RKI)	Berlin[2)]	5				2.5	1.5	1.0								
Leibniz Centre for Medicine and Biosciences, Research Centre Borstel (FZB)	Borstel	8			1.0	5.8	0.5	0.5					0.2			
Foundation Institute for Materials Engineering (IWT)	Bremen	6										0.6	1.8	3.4	0.2	
MPI for Marine Microbiology	Bremen	5			1.1	1.5	1.3				1.0		0.1			
Alfred Wegener Institute for Polar and Marine Research (AWI)	Bremerhaven[2)]	14			1.0						13.0					
Society for Biotechnological Research (GBF)	Brunswick	16			5.2	9.0	0.8						1.0			
Federal Agricultural Research Centre (FAL)	Brunswick[2)]	9			0.2	0.2	8.6						1.0			
Physikalisch-Technische Bundesanstalt (PTB)	Brunswick[2)]	7				1.0			2.0			1.5	1.0		1.5	
Federal Biological Research Centre for Agriculture and Forestry (BBA)	Brunswick[2)]	6				1.0	5.0									
MPI for Plant Breeding Research	Cologne	13			9.9		3.1									
MPI for Neurological Research	Cologne	5				4.0	1.0									
German Aerospace Centre (DLR)	Cologne[2)]	21			0.5	0.5		0.2	0.5		6.5	0.9	5.2	4.7	2.0	
Institute for Heavy Ion Research (GSI)	Darmstadt	7				1.0			6.0							
MPI for Molecular Physiology	Dortmund	6			3.3	2.0		0.7								
Leibniz Institute of Polymer Research (IPF)	Dresden	9				1.0		6.3	0.1			1.3	0.3			
MPI for Molecular Cellular Biology and Genetics	Dresden	9			7.5	1.5										
Leibniz Institute for Solid State and Materials Research (IFW)	Dresden	8						1.0	2.3					3.8	0.9	
Research Institute for the Biology of Farm Animals (FBN)	Dummerstorf	10			1.0		9.0									
MPI for Iron Research	Düsseldorf	9						0.4	1.0			0.1		7.4		
German Diabetes Centre, Leibniz Centre for Diabetes Research (DDZ)	Düsseldorf	5			1.5	3.4	0.04									
Research Centre Karlsruhe (FZK)	Eggenstein-Leopoldshafen[2)]	21			4.9	1.1	2.0	2.0	1.0		4.0		3.0	1.0	2.0	

>> Continued on next page

Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Rhenish Clinics of Essen	Essen	6		0.9		5.1										
MPI of Biophysics	Frankfurt/Main	5			3.7	1.2		0.1								
Senckenberg Research Institute and Natural Museum (FIS)	Frankfurt/Main[2)]	8			0.7						7.3					
MPI of Immunobiology	Freiburg	8			3.3	3.7		1.0								
FhI for Mechanics of Materials (IWM)	Freiburg[2)]	5						0.3					0.7	4.0		
HELIOS Clinics	Fulda[2)]	7			0.3	6.4									0.3	
MPI of Quantum Optics	Garching	5						0.7	4.3							
MPI for Extraterrestrial Physics	Garching	5							5.0							
Institute for Plant Genetics and Crop Plant Research (IPK)	Gatersleben[2)]	9			4.7	0.8	3.5									
Research Centre Geesthacht (GKSS)	Geesthacht[2)]	8											0.4	6.6	1.0	
MPI for Molecular Plant Physiology	Golm	9			8.0		1.0									
MPI of Colloids and Interfaces	Golm	7			0.4			6.0	0.2					0.5		
MPI for Biophysical Chemistry	Göttingen	23			15.4	5.9		1.7								
German Primate Centre (DPZ)	Göttingen	7			2.8	1.9	2.3									
MPI for Experimental Medicine	Göttingen	5			1.5	3.5										
Leibniz Institute for Plant Biochemistry (IPB)	Halle	8			5.8	0.5	1.1	0.5								
MPI of Microstructure Physics	Halle	5							3.0					2.0		
Bernhard Nocht Institute for Tropical Medicine (BNI)	Hamburg	5			1.0	3.9	0.1									
German Electron Synchrotron (DESY)	Hamburg[2)]	5			1.0				4.0							
German Cancer Research Centre (DKFZ)	Heidelberg	61			11.9	46.0	1.0	1.8		0.2					0.2	
MPI of Nuclear Physics	Heidelberg	8							6.0		2.0					
European Laboratory for Molecular Biology (EMBL)	Heidelberg[2)]	15			14.6	0.4										
MPI for Medical Research	Heidelberg[2)]	6			1.2	3.8			1.0							
Leibniz Institute for Age Research, Fritz Lipmann Institute (FLI)	Jena	6			2.5	2.3		0.3							1.0	
MPI for Chemical Ecology	Jena	5			3.2	0.2	1.0	0.6								
Research Centre Jülich (FZJ)	Jülich	46			3.5	5.0	0.8	3.2	14.0		2.7	2.0	3.3	8.9	2.6	
Institute for Composite Materials (IVW)	Kaiserslautern	5						2.6				2.4		0.1		
Federal Research Centre for Nutrition and Food (BfEL)	Karlsruhe[2)]	6				1.0	4.0	1.0								
Leibniz Institute of Marine Sciences (IFM-GEOMAR)	Kiel	17			2.0	2.0					13.0					
Leibniz Institute for Tropospheric Research (IfT)	Leipzig	7						1.4			4.6		1.0			
Herzzentrum Leipzig	Leipzig	5			0.8	4.0							0.1		0.1	
MPI for Evolutionary Anthropology	Leipzig	5	3.0		1.0	1.0										
Centre for Environmental Research Leipzig-Halle (UFZ)	Leipzig[2)]	11			4.1	1.1	2.0				3.9					
Leibniz Institute for Neurobiology (IfN)	Magdeburg	5		0.1	1.1	3.8										
MPI for Polymer Research	Mainz	6			0.1			4.9	0.4					0.7		
Central Institute of Mental Health	Mannheim	9		1.6		7.4										
MPI for Terrestrial Microbiology	Marburg	7			1.7	3.5	0.8	0.1			1.0					

>> Continued on next page

Institution	Headquarter	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
MPI for Biochemistry	Martinsried[2)]	19			9.8	5.2		2.8	1.0				0.3			
MPI for Coal Research	Mülheim/Ruhr	7			0.1			6.1					0.7	0.1		
Bavarian Academy of Sciences	Munich	5	1.2	0.8					1.0		1.0				1.0	
MPI for Physics, Werner Heisenberg Institute	Munich	5							5.0							
MPI for Psychiatry	Munich	5			0.7	4.3										
Bavarian Natural History Collections	Munich	5			3.0						2.0					
Research Centre for Environment and Health (GSF)	Neuherberg[2)]	25			7.6	13.5	0.6	0.5		1.0	1.8					
National Research Centre for Geosciences (GFZ)	Potsdam	16	0.01								16.0					
Astrophysical Institute Potsdam (AIP)	Potsdam	5							5.0							
Baltic Sea Research Institute Warnemünde (IOW)	Rostock	6			1.0	0.3					4.8					
MPI for Informatics	Saarbrücken	7			0.7	0.2		0.1							6.0	0.1
MPI for Metals Research	Stuttgart	12							6.0					5.0	1.0	
MPI for Solid State Research	Stuttgart	10						4.3	4.5						1.2	
MPI for Developmental Biology	Tübingen	5	1.0		3.0	1.0										
Report subtotal[3)]		**810**	**23.3**	**18.1**	**171.2**	**207.7**	**52.5**	**57.4**	**80.0**	**5.2**	**84.5**	**11.1**	**20.7**	**52.9**	**25.3**	**0.1**
Other institutions		**504**	**66.1**	**59.1**	**36.6**	**103.0**	**20.4**	**36.3**	**30.9**	**5.5**	**32.4**	**21.1**	**17.9**	**27.6**	**36.0**	**11.0**
Overall total		**1,314**	**89.5**	**77.1**	**207.8**	**310.7**	**72.9**	**93.8**	**111.0**	**10.7**	**116.9**	**32.2**	**38.7**	**80.5**	**61.3**	**11.1**
Based on: N institutions		**411**	**68**	**54**	**93**	**141**	**45**	**64**	**50**	**9**	**44**	**34**	**38**	**50**	**63**	**16**

>> See page 135 for the abbreviation key

[1)] The subject affiliation of reviewers corresponds to the subject of the review board in which the proposal is evaluated. For reviewers who were active in more than one subject and in different research areas, calculations were based on so-called research area equivalents. For example: If three proposals were reviewed in research area A and one in research area B, the research area equivalent would be 0.75 in A und 0.25 in B.

[2)] and other locations

[3)] Only institutions at which five or more DFG reviewers were employed during the study period from 2002 and 2004 (based on: written reviews).

>> Sorted by headquarters

Table A-21:
Prizewinners in the Gottfried Wilhelm Leibniz Programme by higher education institution and scientific discipline (1986 to 2005)

Higher education institution	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences
Munich U	12	3	6	3	
Berlin FU	11	5	3	1	2
Heidelberg U	11	7	4		
Freiburg U	9	2	6	1	
Marburg U	9		4	5	
Frankfurt/Main U	8	3	1	3	1
Tübingen U	8	4	2	2	
Bonn U	7	2	1	4	
Göttingen U	7			7	
Munich TU	7			3	4
Saarbrücken U	7	1		1	5
Würzburg U	7	1	6		
Aachen TH	6			3	3
Bielefeld U	6	4		1	1
Cologne U	6	3	2	1	
Münster U	6	2	1	3	
Berlin TU	5			3	2
Bochum U	5		2	3	
Kiel U	5		2	3	
Constance U	5	3	1	1	
Stuttgart U	4			1	3
Bayreuth U	3		1	2	
Berlin HU	3			3	
Duisburg-Essen U	3			3	
Düsseldorf U	3		3		
Hamburg U	3	2	1		
Karlsruhe TH	3			3	
Mainz U	3			3	
Paderborn U	3				3
Augsburg U	2	1		1	
Brunswick TU	2				2
Darmstadt TU	2			2	
Erlangen-Nuremberg U	2				2
Freiberg TU	2			1	1
Magdeburg U	2		1	1	
Potsdam U	2	1		1	
Regensburg U	2	1	1		
Ulm U	2			1	1
Bamberg U	1	1			
Bremen U	1				1
Cottbus TU	1				1
Dresden TU	1			1	
Halle-Wittenberg U	1		1		
Hamburg-Harburg TU	1				1
Hannover U	1			1	
Hohenheim U	1		1		
Jena U	1				1
Oldenburg U	1				1
Osnabrück U	1	1			
Siegen U	1			1	
Wuppertal U	1			1	
HEIs in total	**206**	**47**	**50**	**74**	**35**
Based on: N HEIs	**51**	**19**	**21**	**34**	**18**

Table A-22:
Prizewinners in the Gottfried Wilhelm Leibniz Programme by non-university research institution and scientific discipline (1986 to 2005)

Institution	Headquarter	Total	Humanities and social sciences	Life sciences	Natural sciences	Engineering sciences
Max Delbrück Centre for Molecular Medicine (MDC)	Berlin	1		1		
Fritz Haber Institute of the Max Planck Society	Berlin	1			1	
German Archaeological Institute (DAI)	Berlin[1)]	1	1			
German Aerospace Centre (DLR)	Cologne[1)]	1				1
MPI for Iron Research	Düsseldorf	1				1
MPI of Immunobiology	Freiburg	1		1		
FhI for Mechanics of Materials (IWM)	Freiburg[1)]	1				1
MPI for Astrophysics	Garching	1			1	
MPI for Extraterrestrial Physics	Garching	1			1	
Research Centre Geesthacht (GKSS)	Geesthacht[1)]	1				1
MPI for Molecular Plant Physiology	Golm	1		1		
MPI for Gravitational Physics, Albert Einstein Institute	Golm[1)]	1			1	
MPI for Biophysical Chemistry	Göttingen	5		5		
German Electron Synchrotron (DESY)	Hamburg[1)]	1			1	
German Cancer Research Centre (DKFZ)	Heidelberg	3		3		
MPI for Nuclear Physics	Heidelberg	1			1	
MPI for Medical Research	Heidelberg[1)]	1		1		
European Laboratory for Molecular Biology (EMBL)	Heidelberg[1)]	1		1		
Leibniz Institute of Marine Sciences (IFM-GEOMAR)	Kiel	3			3	
MPI for Mathematics in the Sciences	Leipzig	2			2	
MPI for Human Cognitive and Brain Sciences	Leipzig[1)]	2	2			
MPI for Polymer Research	Mainz	1			1	
MPI for Biochemistry	Martinsried[1)]	2		2		
MPI for Coal Research	Mülheim/Ruhr	2			2	
Research Centre for Environment and Health (GSF)	Neuherberg[1)]	1		1		
MPI for Psycholinguistics	Nijmegen	1	1			
National Research Centre for Geosciences (GFZ)	Potsdam	1			1	
MPI for Informatics	Saarbrücken	1				1
MPI for Solid State Research	Stuttgart	1			1	
MPI for Developmental Biology	Tübingen	3		3		
Total		**44**	**4**	**19**	**16**	**5**
Based on: N institutions		**30**	**3**	**10**	**12**	**5**

[1)] and other locations

>> Sorted by headquarters

Table A-23:
Research stays by AvH visiting researchers from 2000 to 2004 by higher education institution and research area

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Munich U	202	64	23	18	20	3	28	29	9	8					
Munich TU	172	1		15	7	6	66	34	10	2	2	8	2	16	3
Berlin FU	172	83	13	5	6	4	28	19	6	7		1			
Berlin HU	164	68	17	11	15	2	10	17	16	6				2	
Heidelberg U	154	51	11	11	8		31	25	6	9	1	1			
Bonn U	133	29	19	12	6	8	15	26	11	3				3	1
Göttingen U	118	24	6	5	10	11	39	10	3	7			2	1	
Erlangen-Nuremberg U	112	8	3	4	10		29	25	8	3	3	10	2	6	1
Tübingen U	112	43	3	12	13	1	14	7	7	9		1		2	
Cologne U	110	49	15	9	7		9	12	4	4	1				
Frankfurt/Main U	104	19	13	5	9		7	42	5	2				2	
Freiburg U	98	24	14	14	16		11	11	3	2				3	
Stuttgart U	91	1	1				13	15	11	7	14	15	3	7	4
Bochum U	90	15		5	2		17	18	2	11	5	2	6	7	
Berlin TU	87	23	1	4		1	11	15	10	2	5	1	3	8	3
Hamburg U	85	18	4	10	7	1	8	26	5	5				1	
Aachen TH	84		1	3	4		23	14	2	2	6	5	18	3	3
Münster U	84	21	7	7	5	1	20	7	3	9			3	1	
Karlsruhe TH	77	1		2	1	1	15	25	3	8	3	6	4	4	4
Darmstadt TU	77	1		3			6	18	4	2	15	7	9	11	1
Bayreuth U	71	22		5		1	10	11	4	15		1		1	1
Würzburg U	68	6	3	10	9	1	21	13	1	4					
Marburg U	63	16	2	6	7	1	16	8	6	1					
Ulm U	62			5	5		24	19	3			1	4	1	
Mainz U	60	11	2	3	5		15	20	1	3					
Dresden TU	58	7	1	3	2		11	14	4	2	4	2	3	2	3
Bielefeld U	55	8	2	2			10	15	16					2	
Giessen U	54	4	7	6	5	7	1	10	10	3		1			
Constance U	54	17	4	5	2		14	10	1			1			
Kiel U	52	8	4	4	4	7	7	2	5	9				1	1
Regensburg U	52	10	7	5	6		8	13	3						
Duisburg-Essen U	50	5	2		3		12	9	5	1	1	2	2	7	1
Hannover U	41	2	1	1			9	11	1	6	2	2	2	2	2
Saarbrücken U	39	14	1	1	3		7	4	4				1	4	
Leipzig U	39	14	2	3	4	1	10	2	1			1			1
Potsdam U	39	9	2	1	1		2	11	4	7	1			1	
Kaiserslautern TU	34			4			5	15	3		3	2		2	
Jena U	32	5		2	4		6	7	5	1			2		
Düsseldorf U	31	5		3	6		7	6	4						
Augsburg U	29	6					4	13	4				2		
Brunswick TU	25			3		2	9	4	2		1		2	1	1
Dortmund U	25	1		2			10	7	1		1	1	1	1	
Halle-Wittenberg U	25	7	1	2	2	2	6	2	1			1			1
Hohenheim U	22		1	4	1	14	1				1				
Bremen U	20		3	1	1		1	2	2	4	3	1		2	
Paderborn U	18	3						4	6		3	2			
Magdeburg U	17	1	1		5			1	5		2		1	1	

>> Continued on next page

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Osnabrück U	17	1	1	6	1			3	2	2			1		
Hamburg-Harburg TU	17			1	1	1					1	6	4	2	1
Wuppertal U	17	2					8	3	3		1				
Clausthal TU	16							7		2			5	1	1
Rostock U	14	1	1		1		4	2	2			1		1	1
Chemnitz TU	13						7	1	2		2			1	
Freiberg TU	11	1					1	1		3	3		2		
Mannheim U	10	1	6	1				1	1						
Kassel U	10	1	1					4	2				1		1
Bamberg U	10	9	1												
Trier U	8	5	3												
Ilmenau TU	7							1	1			2	1	2	
Erfurt U	6	3	2						1						
Report subtotal[1)]	**3,617**	**748**	**212**	**244**	**224**	**76**	**646**	**651**	**244**	**171**	**84**	**84**	**86**	**112**	**35**
Other HEIs	**16**	**4**	**3**				**2**				**1**	**2**		**3**	**1**
HEIs in total	**3,633**	**752**	**215**	**244**	**224**	**76**	**648**	**651**	**244**	**171**	**85**	**86**	**86**	**115**	**36**
Based on: N HEIs	**68**	**52**	**44**	**45**	**39**	**21**	**50**	**55**	**54**	**35**	**26**	**28**	**26**	**36**	**21**

>> See page 135 for the abbreviation key

[1)] Only higher education institutions with five research stays or more from AvH visiting researchers in the specified period.

Source:

Alexander von Humboldt Foundation (AvH): Research stays by visiting researchers (award recipients and fellows) by higher education institution and AvH research area (2000 to 2004).

Calculated by the DFG.

Table A-24:
DAAD-funded foreign researchers from 2002 to 2004 by higher education institution and DFG research area

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA	No classification possible
Berlin HU	186	79	29	16	10	21	3	13	8	4		1		2		
Berlin FU	178	81	38	13	8	6	5	8	6	11						2
Munich U	110	46	19	13	10	3	2	7	2	8						
Göttingen U	107	18	6	18	6	40	7	3	2	7						
Heidelberg U	98	45	9	5	14		4	9	3	6	2	1				
Dresden TU	92	12	9	6	2	8	7	11	3	2	14	1	1	9	7	
Aachen TH	91	3	1	4	2	2	3	8	4	4	25	7	8	14	6	
Tübingen U	89	33	16	10	6		9	3	2	9				1		
Kassel U	87	17	25	2		17	3	7	1	1	5			3	2	4
Hannover U	87	11	11	9	3	8	9	2	1	3	10	5		6	8	1
Bochum U	84	38	6	2	4		3	9	4	3	2	1		5	7	
Leipzig U	84	36	5	7	7	5	10	6	1	4					1	2
Giessen U	81	6	4	14	5	34	3	7	2	6						
Freiburg U	80	35	9	7	10	7	9			3						
Hamburg U	78	26	10	11	6	2	7	4	2	5				4		1
Berlin TU	77	12	5	5	1	4	5	2	4	3	7	3	7	5	13	1
Bonn U	74	21	9	11	1	12	8	2	3	5				1		1
Karlsruhe TH	73	3	4	6		4	16	8	4	2	14	3		6	3	
Stuttgart U	65	6	3	3		1	2	7	4	5	18	2		5	9	
Hohenheim U	64		2	12	1	43	3		1		2					
Frankfurt/Main U	64	25	16	9	3		1	4	2	3						1
Erlangen-Nuremberg U	62	7	8	2	12	1	4	3	3	7	4	4	2	5		
Münster U	59	16	12	11	5	1	6	4	2	1				1		
Darmstadt TU	57	4	3	5			5	12	9	4	7			5	3	
Cologne U	57	26	11	2	9	1		3		4						1
Würzburg U	54	15	2	7	10	1	9		3	6				1		
Halle-Wittenberg U	53	18	2	6	1	14	3	2		2	3	2				
Bremen U	52	15	6	5		3	4	4	6	1	1	1		5	1	
Kiel U	51	6	5	5	3	10	2	4	3	7				3	2	1
Potsdam U	50	13	9	1	2		5	4	10	6						
Bayreuth U	48	12	2	9	1	4	8	2	3	6						1
Munich TU	45		1	3	5	8	4	4	3		9			5	3	
Rostock U	44	5	2	6		9	10	4	3		4	1				
Marburg U	43	21	7	3	1		7		1	3						
Jena U	40	9	6	5	4	2		6	4	3		1				
Düsseldorf U	38	14		6	4		3		7	3	1					
Magdeburg U	38	4	2		3		4	3	6		8	2	1	5		
Mainz U	37	14	2	2	4		5	2	3	3						2
Constance U	36	13	8	4		1	1	7	1					1		
Bielefeld U	36	10	11	5			1	1	5	1		1		1		
Duisburg-Essen U	34	8	3	1	1		6	1	3		2		1	6	2	
Brunswick TU	33	2	4	3		1	7	4		3	3		1	2	3	
Saarbrücken U	30	16	1	3			7	1			1			1		
Ulm U	27		2	4	7		8	1	1			1		3		
Ilmenau TU	27	2					1	2	1		8		1	11	1	
Dortmund U	25	2	2	2		1	2	1	3		2	3		1	5	1
Regensburg U	18	4	4	2	1		5		1	1						
Hamburg-Harburg TU	14			2		1		3		2	3			1	2	
Mannheim U	11	5	6													
Passau U	8	3	5													
Frankfurt/Oder U	5	1	4													
Report subtotal[1)]	**3,081**	**818**	**366**	**287**	**172**	**275**	**236**	**198**	**140**	**157**	**155**	**40**	**22**	**118**	**78**	**19**
Based on: N HEIs	**51**	**47**	**48**	**46**	**35**	**32**	**45**	**42**	**42**	**38**	**24**	**18**	**8**	**29**	**18**	**13**

>> See page 135 for the abbreviation key

[1)] Subject-related data for DAAD-funded scientists and academics is available for 51 higher education institutions, whose total expenditure amounted to at least one million euros per year. A total of 3,601 scientists and academics from abroad were funded at 154 higher education institutions by the DAAD during the specified period.

Source:

German Academic Exchange Service (DAAD): DAAD-funded foreign researchers by higher education institution and DAAD subject (based on: 51 HEIs; 2002 to 2004). Calculated by the DFG.

Table A-25:
Participations in DFG cooperative research programmes[1)] from 2002 to 2004 by higher education institution and research area

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Berlin HU	87	14	10	22	13	1	6	9	8	1	1			2	
Berlin FU	65	8	7	20	11	3	5	4	3	3				1	
Munich TU	64	2	2	12	13	4	2	7	3		10	5		3	1
Munich U	62	11	6	13	17	2	2	7	2	1				1	
Heidelberg U	57	7	8	14	13		2	6	4	1	1	1			
Berlin TU	49	3	3	8	3	2	4	5	6	3	6	3		3	
Tübingen U	45	15	3	9	7	2	3	4		2					
Bochum U	45	6	4	10	1		4	10	1	2	2	1	2		2
Würzburg U	44	2	2	14	16	1	3	5		1					
Stuttgart U	44	5		3		1	2	5	1		11	4	3	4	5
Bonn U	41	4	4	11	5	2	4	5	2	2			1	1	
Erlangen-Nuremberg U	40	6	1	5	10		3	2	1		5	1	1	5	
Aachen TH	39	1	1	2	1	1	6	1	2	1	6	6	7	2	2
Göttingen U	37	3	1	15	5	4	4	1	3		1				
Frankfurt/Main U	37	10	4	8	6		4	3	1					1	
Karlsruhe TH	35	1	2		1		3	4		4	5	3	2	7	3
Dresden TU	35	2		2	2	1	4	5	1	2	4	2	1	6	3
Darmstadt TU	35		1	6	1		4	6		2	5	4	1	4	1
Hamburg U	33	6	4	9	5		2	4	1	2					
Mainz U	33	7	3	3	8		5	5		2					
Giessen U	33	7	6	8	6	4	1	1							
Cologne U	30	4	2	7	10		1	3	1	2					
Freiburg U	28	1	4	8	5	1	3	1	3	1	1				
Marburg U	28	3	4	8	6		3	4							
Bielefeld U	27	6	5	6	1			3	4		1			1	
Hannover U	26			1	3	3	1	3			12		2		1
Dortmund U	26	1	3				3	3	3		7	1	1	3	1
Münster U	24	3	2	3	5		5	2	2	1		1			
Halle-Wittenberg U	24	5	1	6	1	2	4	3			2				
Leipzig U	24	5		5	2	1	3	5	1					2	
Duisburg-Essen U	22	1	3	1	2		3	6	1	1	1	2			1
Jena U	22	5	3	7			2	2	2					1	
Saarbrücken U	22	2	6	3	3		1	2		1	1			1	2
Düsseldorf U	21	3		7	8			3							
Constance U	21	7	4	1	1		1	4	1	1				1	
Regensburg U	21	5	1	5	2		3	5							
Hannover MedH	20			5	12	2	1								
Kiel U	19	1	1	2	3	3		1	1	6				1	
Potsdam U	18	8	1	5			1	2	1						
Mannheim U	17	2	6		3			2	3		1				
Brunswick TU	16			4		1		1			6	1	1		2
Magdeburg U	16		1	1	3			2	1		2	3	1	2	
Ulm U	15			2	8		3	2							
Bremen U	13		2	1				2		4	2	2			
Chemnitz TU	12		1				2	1	1		6			1	
Kaiserslautern TU	11			2			1	3	1		1		1	1	1
Paderborn U	11	1						1	1		2		2	4	
Hohenheim U	10			2	1	5					1	1			
Osnabrück U	10	2	3	3				2							
Bayreuth U	9	1		1	1	1	1	3							1
Lübeck U	9			3	5				1						
Greifswald U	9	1	1	3				2		1				1	
Wuppertal U	9	2						4						2	1
Clausthal TU	8						2	1	1		1		3		
Augsburg U	8	2	2					2	2						
Trier U	8	4	2						1	1					
Kassel U	8		1	1		1	1				1			2	1

>> Continued on next page

Higher education institution	Total	HUM	SOC	BIO	MED	AGR	CHE	PHY	MAT	GEO	MIE	TPE	MSE	ELE	CEA
Hannover TiHo	8			1	5	2									
Rostock U	7			1			1	3			1			1	
Freiberg TU	7			1				1	1	1	1	2			
Munich UdBW	6	1	1		1						1	1		1	
Oldenburg U	5			3	1					1					
Siegen U	5	2	1				1	1							
Bamberg U	5	3	2												
Hamburg-Harburg TU	4								1				1	1	1
Ilmenau TU	4		1								1	1		1	
Cottbus TU	4					2								2	
Bremen IU	4		1	2	1										
Weimar U	3	1													2
Berlin UdK	3	1									1			1	
Hagen FernU	2		1						1						
Frankfurt/Oder U	1	1													
Karlsruhe HfG	1	1													
Passau U	1					1									
Munich HPhil	1	1													
Berlin FHTW	1											1			
Report subtotal[2)]	**1,654**	**206**	**138**	**305**	**237**	**53**	**120**	**184**	**74**	**50**	**110**	**46**	**30**	**70**	**31**
Other HEIs	**18**	**5**	**4**	**1**	**3**		**1**	**1**		**1**				**2**	
HEIs in total	**1,672**	**211**	**142**	**306**	**240**	**53**	**121**	**185**	**74**	**51**	**110**	**46**	**30**	**72**	**31**
Based on: N HEIs	**90**	**57**	**50**	**54**	**47**	**26**	**45**	**56**	**38**	**28**	**34**	**21**	**16**	**35**	**18**

>> See page 135 for the abbreviation key

[1)] Collaborative Research Centres (including programme variations), Research Units, Research Training Groups and Research Centres

[2)] Only higher education institutions that received more than €0.5 million in DFG funding between 2002 and 2004, and which participated in at least one programme.

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