

Deutsche Forschungsgemeinschaft

Nurturing Tomorrow's Research Leaders

The Heisenberg Programme



DFG

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Named after a Nobel Laureate

The Heisenberg Programme is all about quality

At age 26, Werner Heisenberg was appointed professor; at 32 he was awarded the Nobel Prize – an exceptional career that many aspire to but few achieve. Heisenberg was therefore the obvious choice when it came to naming a new programme for promoting young, highly qualified researchers headed for professorship. From the very beginning it was clear that successful applicants would have to be top-tier talent and “young for their accomplishments”, as it was put by Heinz Maier-Leibnitz, the DFG President at the time.

The decision 30 years ago to establish this programme was driven by two considerations that remain important to this day.

On the one hand, young researchers who were already qualified for professorship but had yet to be offered a permanent position at a German university were to be given an opportunity to bridge the gap with independent research work. The objectives were to keep highly gifted young researchers from switching to fields outside of science and to retain their talent for research in Germany, as well as to achieve a balanced age structure at research institutions.

On the other hand, there was a desire to allow exceptionally qualified scientists and academics to pursue independent research, unencumbered by supervisors, institutions or predetermined projects. It is especially the freedom to choose their own topic, their schedule and their workplace (for a period of up



to five years) that has made this fellowship so attractive for many applicants. Quite a few funding recipients use their fellowship for a stay abroad.

The programme was originally designed to run for five years and fund 750 fellowships. It was hoped that after this period the difficult job situation would have improved. The vast majority of these early fellows found suitable positions. At the same time, word quickly got around about the excellent quality of the fellows and of the programme. In 1991 this success ultimately persuaded the DFG to continue the programme out of its own budget to systematically promote excellence, even after the job situation had improved.

The last major innovation was the introduction of the Heisenberg professorship in late 2005. Interestingly, Heisenberg professorships had been included in the initial concept and suggested several times. Originally they were supposed to follow up the fellowship period or provide provisional appointments, to be eliminated as soon as the Heisenberg fellow was offered a permanent professorship. Under the current solution,

the DFG provides start-up funding for a professorship for five years. Following a successful interim review, the position then converts into a regular university professorship. This model can be considered the beginning of a tenure-track system with secure career prospects and thus represents a big step forward for young researchers in Germany.

Today the Heisenberg Programme is one of the DFG's most renowned funding programmes. Since 1978 it has supported over 2,000 researchers, many of whom have attained prominent positions in science and academia, or – as I predict with certainty – will do so in the future.

Prof. Dr.-Ing. Matthias Kleiner
President of the
Deutsche Forschungsgemeinschaft

Testimonials



After spending time abroad at Fermilab, Chicago, and the University of Rochester, New York, the Heisenberg fellowship allowed me to shift my research focus from P anti-P scattering

at 2 TeV at the Tevatron to PP scattering at 14 TeV at the LHC – even while realising a dual-career solution together with my wife, also a particle physicist, at the Max Planck Institute for Physics.

Prof. Dr. Arnulf Quadt
Institute of Physics II,
University of Göttingen

As one of the first Heisenberg fellows in 1978 I benefited early on from what was then a unique new programme to promote young researchers. I took full advantage of it,



pausing twice to take on visiting professorships, and leveraged it for my development as an academic. The fellowship certainly contributed to my appointment as the first professor for ecological psychology. At any rate, it marked the beginning of my professional career, also in the area of research policy.

Prof. Dr. Lenelis Kruse-Graumann
Institute of Psychology,
Division of Ecological Psychology,
FernUniversität in Hagen - University of Hagen



The Heisenberg fellowship was the most important support I received throughout my career. It was a valuable experience to see Germany's premier research organisation make

such an enormous leap of faith. Even though researchers tend to specialise early these days, a Heisenberg fellowship proves, for the first time in a young researcher's career, that the greater community recognises that scientist's achievements, conferring responsibility by ensuring maximum freedom.

Prof. Dr.-Ing. habil. Dierk Raabe
Head of Microstructure Physics
and Metal Forming, Max Planck Institute
for Iron Research, Düsseldorf

Independent, Motivating, Generous Career Support

The Heisenberg fellowship has been a great career opportunity for many researchers



What did the Heisenberg fellowship mean for someone who was 39 at the time? Quite simply relief from all that daily hyper-bureaucratic nonsense that an assistant at a per-

petually reforming German university has to take care of. I was able to resign from my assistant position, concentrate on teaching young, smart students, which brought me many moments of happiness, read really thick books, and even write some myself. A fabulous time without frustrations! Sadly, the call to my first professorship came all too soon.

Prof. Dr. Friedrich Wilhelm Graf
Faculty of Protestant Theology,
Department of Systematic Theology,
Ludwig Maximilian University of Munich



After I completed my doctorate I went into Big Science. An exciting field, large facilities, long-term projects, international measuring campaigns, my own team, a well-paid permanent position – in short, an excellent career environment. But, after an extended stay in Stanford, all of that just wasn't enough anymore: there was no interaction with students. A successful Heisenberg proposal enabled me to return to academia.

Prof. Dr. Katharina Kohse-Höinghaus
Department of Physical Chemistry I,
University of Bielefeld



At first the fellowship was a great piece of fortune and a great reassurance. A great piece of fortune because, as a recently habilitated adjunct professor, I was freed from the dreary pros-

pect of trying to economically survive the next five years, in which hardly any vacancies were expected to open up. And it was reassuring to see that all my work hadn't been in vain but was being positively acknowledged. However, since shortly afterwards I had the luck to receive a call to fill the only vacant chair, I ended up declining the fellowship.

Prof. Dr. Joachim Rückert
Department of Legal History,
University of Frankfurt am Main

Fantastic! The fellowship was one of my life's most positive experiences. Independent, motivating, generous in its implementation, uncomplicated in its procedures, it allowed me to thrive and blossom. I could hardly believe that something like this existed. It gave me the courage to be one of the best. Thanks to all who made this possible for me.



Prof. Dr.-Ing. Bernd Kröplin
Institute of Statics and Dynamics of Aerospace Structures, University of Stuttgart

The Heisenberg fellowship enabled me to work continuously with two of the most reputable teams for nonlinear dynamics, at the universities of Potsdam in Germany and Maryland in the US. During this period I formed many international cooperative relationships, which have played a crucial role in my scientific career and continue to influence my research to this day.



Prof. Dr. Ulrike Feudel
Institute for Chemistry and Biology of the Marine Environment (ICBM), University of Oldenburg

The Heisenberg fellowship was the most privileged phase of my academic life so far, and one for which I am extremely grateful. Not only was I able to organise my time freely and work productively without restrictions, I also had the opportunity to go on long and intensive visits abroad, doing field work in Southeast Asia. Never before or afterwards have I enjoyed so much creative freedom. And "on the side" I also gave birth to our son during this period.



Prof. Dr. Frauke Kraas
Department of Geography, University of Cologne



The Heisenberg fellowship allowed me to focus on my research activities and to visit the US for extended periods to work on collaborative projects. It was also an important quality criterion and definitely one of the reasons why I was offered professorships.

Prof. Dr. Jürgen Soll
Department of Biology I, Botany, Ludwig Maximilian University of Munich

In 1995, the fellowship gave me the opportunity to join the newly founded Max Planck Institute for the History of Science in Berlin. I tackled new projects there which I hadn't even mentioned in my application, and I didn't have a bad conscience because I sensed that the Heisenberg Programme is based on trust and freedom – trust that fellows will make the most of their privileged situation and feel free to pursue whatever research is closest to their heart.



Prof. Dr. Michael Hagner
Science Studies, ETH Zurich



The Heisenberg Programme enabled me to go abroad for extended research visits, which have definitely enriched my scholarship and my knowledge of the international university system. Being able to do research at the foremost institutions in the United States was important for my development and my career. My stay in Potsdam was particularly helpful in preparing me for my current leadership position.

Prof. Dr. Artemis Alexiadou
Institute of Linguistics, English Department, University of Stuttgart

After I habilitated at the University of Frankfurt at age 30, the Heisenberg fellowship gave me the wonderful opportunity to keep working on my research projects, without the pressure of having to find a permanent position as soon as possible. I used my fellowship to go to the Optical Sciences Center at the University of Arizona, where after one year I got a tenure-track position as an associate professor.



Prof. Dr. Stefan W. Koch
Faculty of Physics, University of Marburg

I received the Heisenberg fellowship in 1994, simultaneously with an offer to substitute for a professor at the Bundeswehr University in Neubiberg, which is why I didn't take up the fellowship. But when I was appointed to this chair in 1996, and for all my applications up to that point, the fellowship was extremely helpful. The reputation alone of having been accepted into a DFG excellence programme gave me an immediate advantage with appointment committees.



Prof. Dr. Merith Niehuss
Historian, President of the Bundeswehr University in Neubiberg

Without the Heisenberg fellowship my academic career would have taken an entirely different course, and certainly a less successful one. The fellowship came at just the right time, and by allowing me to visit American and British research institutions it opened new horizons that helped define my future work. Contacts I was able to make 20 years ago still provide a solid basis for transatlantic collaboration today.



Prof. Dr. Bernd Engler
American Studies, Rector of the University of Tübingen

Quality Standards As High As Ever

Over 2,000 fellows since the inception of the Heisenberg Programme

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It must have been due to the name that a disproportionately large number of physicists participated in the first round of proposals for Heisenberg fellowships. Today “Heisenberg” stands for quality in all areas of research while the reason behind the programme’s name is sometimes forgotten. “To me, Werner Heisenberg embodies everything we expect of our fellows,” says Dr. Robert Paul Königs, Head of the DFG’s Scientific Affairs Department. “Heisenberg was young, he was an outstanding researcher, and he was mobile.”

In 1927 Werner Heisenberg, only 26 years old, formulated one of the fundamental tenets of quantum mechanics: the Heisenberg uncertainty principle. That same year he was appointed professor in Leipzig; three years earlier he had already been Max Born’s assistant and worked with Niels Bohr in Copenhagen. In 1932 he received the Nobel Prize. He is even one of a select group of scientists whose names have made their way into popular culture: “Heisenberg compensators” are a 24th century invention, devised on a famous starship. But back to the 20th century.

What to do with young talent?

During the 1960s and 1970s West Germany experienced a period of extraordinarily rapid growth in higher education. Existing universities were expanded and many new ones established. So many permanent positions were created that it didn’t seem necessary to promote up-and-coming scientists through special programmes. But once the boom was

over, the chances of young scientists and academics finding long-term employment in science and research diminished significantly. The jobs that had been created during the expansion phase were already occupied by young researchers; the job market was sewn up for years to come. What to do with highly gifted young talent?

On 4 November 1977 the heads of Germany’s federal and state governments, following a recommendation by the Federal and State Commission for Educational Planning and Research Promotion, adopted an effective countermeasure. The DFG was put in charge of implementing it. The politicians wanted to keep “those with a particular penchant and talent for research and scholarship from seizing opportunities in non-research fields, thus being lost to science and academia,” as stated in the DFG’s 1978 annual report.

The Heisenberg Programme was to enable qualified young researchers “to devote themselves to research, free from other obligations, in order to retain them in science and academia.” It wasn’t just about preventing brain drain until new job openings became available – the inventors of the Heisenberg Programme also wanted to invigorate research in general, and thereby sustain and enhance innovation in

A 1978 newspaper advertisement announcing the DFG’s first call for proposals in the Heisenberg Programme



Germany. This is exactly why so much is being done these days to support young research talent, especially by the DFG. “Promoting young researchers is very close to our hearts and one of our core missions,” emphasises Robert Paul Königs. Although in 1951 the DFG’s statutes made no mention of it, the “education and advancement of young researchers” was incorporated into the statutes as a goal in 1959. Today everybody understands that investing in talented minds brings out the country’s greatest potential.

Strong showing by physicists

The Heisenberg Programme was the DFG’s first new programme to be launched since the Collaborative Research Centres were initially started in 1967. For the first round of funding, from 1978 to 1982, the budget provided for a total of 750 fellowships. By 15 December 1978, the application deadline for the first round, 344 proposals had been received in Bonn. With 44 applicants for physics, the eponym’s research area made the strongest showing, followed by 19 proposals for mathematics. Other clusters were found in theoretic-



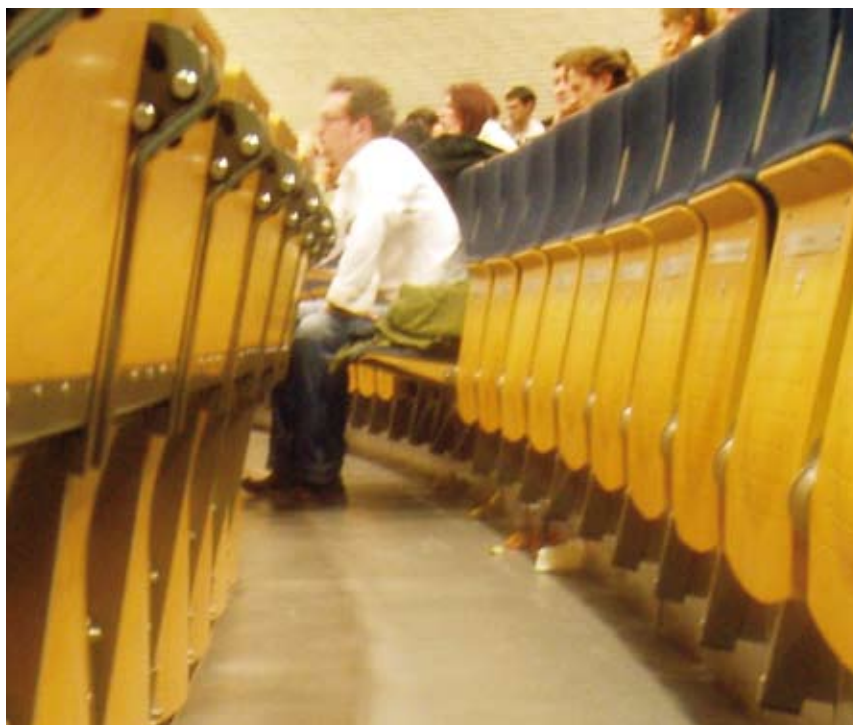
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cal medicine and biology; 55 applications were received for the humanities. Conspicuously under-represented were the engineering sciences and practical medicine. Robert Paul Königs has an explanation: "In those fields there are other paths that lead to professorship, for example work in an industrial or clinical setting." Not much has changed in this regard – only a few engineers have joined the programme since then. Many other things did change, however: once the DFG realised that overly rigid rules turn off creative minds, it did away with the age limit of 33, as it did for its other programmes. Today's Heisenberg fellows are a bit older on average than those of the past; the largest cohort is between 35 and 40 years old.

While women were highly under-represented during the first round in 1978 – they made up only 7% of applicants and 5% of those accepted – their share increased to 22% in 2006. "But it's not necessarily a good sign to see more women fellows." Robert Paul Königs warns of undue optimism. "It turns out that permanent positions still tend to go to men, whereas women have to scrape by on fellowships."

A brand name

One thing has not changed since the Heisenberg Programme was launched 30 years ago: the scientific quality standards which successful applicants must meet are extremely demanding. However, eligibility for professorship is also an important criterion, though, unlike in the past, habilitation is no longer



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a prerequisite. Rejection rates are still high, and the programme can boast an amazing track record. "Due to the strict criteria it applies, the fellowship has become a brand name and gained an extraordinary reputation," says Robert Paul Königs.

A Heisenberg fellowship is more than a CV boost. Yet quite a few researchers, knowing they won't even need the funding, have applied for that very reason. Today it seems hard to believe that the programme initially suffered a lack of applicants. Eugen Seibold, DFG President from 1980 to 1985, surmised at the time that the fellowship might not be very attractive due to a

poor outlook for permanent positions. Indeed it wasn't until 1990 that all of the originally intended 750 fellowships had been awarded. Yet there was never any doubt about the mission of the programme, because a shortage of habilitated scientists and scholars was still looming. Therefore, as part of the Higher Education Special Programme II, a "Heisenberg" succession plan was developed for 1991 to 2000.

DFG continues "Heisenberg"

The third phase of the Heisenberg Programme was initiated by the DFG itself. Once the special funds were exhausted, newly approved fellowships could not

have been financed throughout their given term. “Therefore the DFG decided rather quickly that both the Heisenberg Programme, as an outstanding excellence programme for future university teachers, and a scaled-down fellowship programme for habilitation candidates should be continued and financed from its own regular budget starting in 2001,” said the DFG Secretary General at the time, Dr. Reinhard Grunwald, in 2000.

These days there are fewer physicists – even the Heisenberg Programme has been affected by the much-discussed transition from the century of physics to the century of biology. Proposals in the life sciences, including biology and medicine, now outnumber applications from natural scientists, among whom physicists have actually become a minority. And scholars in the humanities and social sciences haven’t been scared off by the physicist-inspired title. They

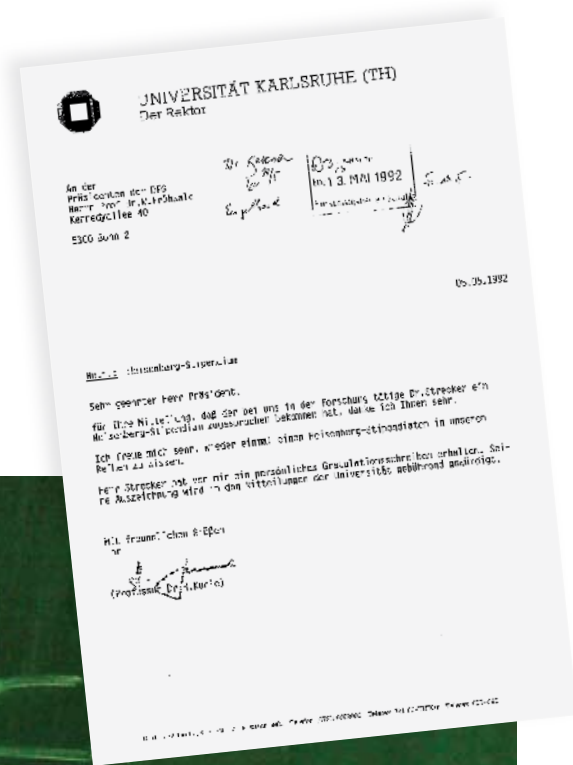
the Leibniz Prize. In addition, many former fellows currently serve on the DFG’s highest statutory bodies. With Klaus von Klitzing, a first-round fellow, there’s even a Nobel laureate in physics – like Heisenberg himself – among the alumni. According to Klaus von Klitzing, the Heisenberg fellowship was a crucial prerequisite for his 1985 Nobel Prize success (see page 10). To date the DFG has granted over 2,000 fellowships – a lack of applicants has long become a problem of the past.

What was originally meant to alleviate a temporary job bottleneck has become a key instrument for promoting young researchers, and one that is still in a class of its own. Funding for young researchers, such as that offered by the Max Planck Society or the Helm-

searchers to multitask, the Heisenberg Programme points in a clear direction. “A Heisenberg fellow has made a commitment to science.”

Susanne Weiss

A letter of thanks from University of Karlsruhe’s president to the president of the DFG for a Heisenberg grant to one of its researchers



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have been responsible for about one-third of all proposals submitted during the programme’s first 30 years.

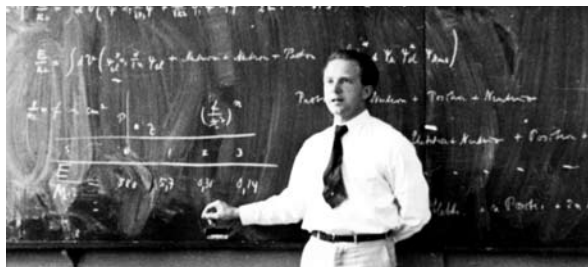
Outstanding track record

A look at the post-fellowship careers of Heisenberg alumni reveals the programme’s outstanding track record. No fewer than 28 of them have been honoured with Germany’s most important and highly endowed research award,

the Leibniz Prize, which is usually tied to a certain institution. “What makes this typical of the DFG”, explains Robert Paul Königs, “is that it’s not a structural programme but rather an individual grant that allows young people to devote themselves to their research, free from institutional and structural constraints.” And he points out yet another unique feature. While it has become fashionable to promote the ability of young re-

A Playful Genius

Werner Heisenberg
revolutionised physics



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Early on Werner Heisenberg displayed two qualities that would define his bright career: talent and ambition. His secondary-school teachers already noticed the “playful ease” with which he made his “outstanding achievements”. He was also “quite confident” and eager to impress. Later on, as a professor, Heisenberg played table tennis and wanted to be the best there as well – just like in science and in chess.

Nobel Prize in record time

Born in Würzburg in 1901 to an equally ambitious father – the son of a craftsman who managed to become a professor of Greek – Heisenberg discovered during his Munich schooldays the joy of “playing around between mathematics and direct experience”. He taught himself mathematics as a way to describe the laws of physics. From 1920 on he studied physics in record time. Only one year after he submitted his doctoral thesis “On the Stability and Turbulence of Fluid Flow”, he habilitated in Göttingen with Max Born, whose assistant he had become. In 1927, at the age of 26, Heisenberg was called to Leipzig as Professor of Theoretical Physics.

Thanks to this young researcher, the Saxonian university became connected to the centres of modern nuclear physics: Copenhagen, Cambridge and Göttingen. An inspiring teacher, he also attracted highly gifted students, among them Carl Friedrich von Weizsäcker and the future “father of the hydrogen bomb”, Edward Teller. Together with them Heisenberg laid the foundations for solid-state quantum mechanics, for

which he received the Nobel Prize in 1932. Along with Niels Bohr, Max Born und Pascual Jordan, he developed the uncertainty principle, which defies the laws of classical physics.

At the beginning of the Nazi regime the renowned physicist spoke out against the expulsion of Jewish scientists – with little success. He was attacked when he refused to sign a declaration of loyalty to Hitler. In 1937 proponents of “Aryan physics” turned against him and his quantum physics, which they deemed infiltrated by Jews. Heisenberg remained in Germany, despite generous offers from American universities.

During World War II he led the uranium project of Germany’s Army Ordnance Office. Its purpose was to investigate possible applications of nuclear fission. In 1942 he became the director of the Kaiser Wilhelm Institute for Physics in Berlin-Dahlem, which was supposed to continue the large-scale experiments. Shortly before the end of the war, the Allied forces arrested Heisenberg and other nuclear researchers and took them to the United Kingdom. Because of his career during the Third Reich, Heisenberg was not uncontroversial after the war.

Committed to promoting young researchers

His student Carl Friedrich von Weizsäcker said later about Heisenberg: “He was a brilliant scientist, then an artist, and, owing to a sense of obligation, a homo politicus.” Especially in post-war Germany, Heisenberg’s activities were focused on research policy. Under the umbrella



of the Max Planck Society he founded an Institute of Physics in Göttingen and served as its director from 1946 to 1958. After that he headed the Max Planck Institute of Physics in Munich until 1970. At the head of the Deutsche Forschungsrat, a predecessor to the DFG, Heisenberg helped shape basic research from 1949 to 1951. As the first president of the re-established Alexander von Humboldt Foundation between 1953 and 1975 he was especially committed to promoting young researchers.

Heisenberg married Elisabeth Schumacher in 1937 and had seven children. He died in Munich in 1976.

Magdalena Schaeffer

Heisenberg Fellowship Made Nobel Prize Possible

Klaus von Klitzing

was one of the first fellows

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In the night before 5 February 1980, Klaus von Klitzing made the crucial breakthrough: he discovered the quantum Hall effect. The physicist realised that the unit of electrical resistance (Ohm) is precisely defined by two physical constants – Planck’s constant h and the electron charge e – and is thus itself a physical constant. The von Klitzing constant has since been a universal standard for measuring resistance. It is used around the world to standardise and calibrate resistors – for instance by the Federal Physical and Technical Institute in Germany. In 1985 Klaus von

Klitzing was awarded the Nobel Prize for Physics. A few years earlier he had been one of the first Heisenberg fellows.

“A Heisenberg fellowship makes a Nobel Prize possible,” would be a fair statement, says the physicist. “Without the fellowship it would have been much harder to get into the best laboratories for my research.” At the time, Klaus von Klitzing had to travel to a special German-French laboratory for generating high magnetic fields in Grenoble. There he was able to make the measurements that ultimately led to his prizewinning

discovery. Nowadays such high magnetic fields can be generated with superconducting coils, which are available in many laboratories. “Freedom is the most important aspect of the fellowship,” the scientist says, and he mentions another benefit that many young researchers long for – “responsibility”.

Klaus von Klitzing, born in 1943 in the Province of Posen (today Poland), studied physics at the Technical University of Braunschweig and graduated in 1969. Then he switched to the Julius Maximilian University in Würzburg, where he earned his doctorate in 1972. Between 1975 and 1978 he did research at the Clarendon Laboratory in Oxford, among other places.

When he applied for the Heisenberg fellowship in 1978 he had already habilitated. The same year he made his groundbreaking discovery he was offered a professorship in solid state physics by the Technical University of Munich. In January of 1985, the year he received the Nobel Prize, Klaus von Klitzing went to Stuttgart to head one of the departments at the Max Planck Institute for Solid State Research, where he still works. His address: Heisenbergstraße 1, and then down the Von-Klitzing-Pfad.

Physics for the general public

“Scientific drive and idealism” steered Klaus von Klitzing toward a career in research. He is still committed to basic research and actively tries to generate enthusiasm and curiosity about physics, and to make his subject accessible to the general public. Now there’s even an award named after this multi-award-winning physicist. In 2005 the Carl von Ossietzky University of Oldenburg and the non-profit EWE Foundation began to honour outstanding science educators with an annual Klaus von Klitzing Prize.

Susanne Weiss

Intrigued by Research Management

Jürgen Mlynek

calls for clear career paths

A litmus test for his professional future – that was what the Heisenberg fellowship meant, says Professor Jürgen Mlynek. The President of the Helmholtz Association of German Research Centres decided back then that, should it not work out with the fellowship, he was no longer going to pursue a career in science. “I actually had a plan B. I had a job lined up as a board assistant with a major corporation.” Plan B stayed in the drawer. Today the research manager is himself an active supporter of young scientists and academics.

Jürgen Mlynek, born in Gronau an der Leine in 1951, studied physics at the Technical University of Hanover and at the École Polytechnique in Paris. In 1979 he did his doctorate in Hanover, then spent one year at the IBM research lab in San Jose, California. He gained his habilitation in Hanover in 1984. “The situation was ideal back then. I came back from the US, habilitated in Hanover when I was only 33, and then immediately got the Heisenberg fellowship.” The physicist used his fellowship for a little less than a year at the TU Hanover and then went to the ETH Zurich as an assistant professor. In 1990 he was offered a Chair in Experimental Physics at the University of Constance, where he would research and teach for a whole decade. But during this time he also began to be intrigued by research management. In September 2000 the scientist moved to Berlin to become the president of Humboldt University. Early in 2001 he resigned from his post as Vice President

of the DFG, which he had held since 1996. Jürgen Mlynek led Humboldt to become one of the premier German universities. Promoting young researchers was especially important to him – under his aegis Humboldt was the first German university to announce “junior professorships”. As a university educator he helped supervise over 100 theses; ten of his former students are professors today. The physicist’s work has been recognised with many awards, including the DFG’s prestigious Leibniz Prize in 1992.

Head of the Helmholtz Association

Since September 2005 Jürgen Mlynek has been the President of the Helmholtz Association, which has since further increased individual funding for talented young researchers. There are currently about 70 independent junior research groups working under the umbrella of the Helmholtz Association, each with annual funding of about 250,000 euros over five years. Their number is set to

increase to about 100 over the next few years. “We offer young researchers early independence, excellent working conditions and a tenure option,” says Mlynek. After three to four years and a positive review of their scientific performance by independent experts, researchers are eligible for tenure. This model has already shown some success in persuading young researchers at top institutions abroad to return to Germany, says the president.

Jürgen Mlynek calls for clear career paths for young scientists and academics. “I still think the habilitation model is anachronistic and a competitive disadvantage. Fortunately, over the last ten years, programmes such as the DFG’s Emmy Noether Programme, the Helmholtz Young Investigator Groups, and “junior professorships” have done a lot to move the system forward.”

Doris Bünnagel



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A Model That Aims to Encourage

The Heisenberg professorship: Interview with Beate Scholz and Paul Heuermann

The first Heisenberg professorships have been approved.

How has the response been?

Heuermann: Initially only the scientists themselves showed an interest. But now we also get many enquiries from univer-

ship achieves its desired effect: universities develop appropriate mechanisms for long-term career paths, and an awareness for systematic HR planning and development is thus being created at German universities.

But the Heisenberg professorship also offers more flexibility in another respect. Researchers can first take advantage of the fellowship, for example by doing research abroad. Then, for the Heisenberg professorship, which has a long-

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sity departments and administrations. We welcome this development because it means that this new funding instrument is successfully establishing itself. We also get a broader range of subjects, even though it's harder for smaller subjects with less financial and HR flexibility to decide on a specific research strategy.

Scholz: What I consider important is that the universities focus more strongly on aspects of research strategy when they make their HR decisions. That's also becoming apparent with the Heisenberg professorship and the universities' growing interest in it. It seems they've now begun to actively recruit outstanding researchers and are trying to retain them. In this way the Heisenberg professor-

There is no age limit for Heisenberg professors. Why?

Scholz: We want to create flexible career paths, enable diversity, make room for different professional biographies, and accommodate a wide range of researcher personalities. What counts are scientific quality and a person's track record in relation to their age. Flexibility is also important when it comes to dual career couples in academia. If you want to attract top-level researchers, you increasingly have to offer attractive professional opportunities to their often equally qualified partners – assuming, of course, they have the right track record. This aspect is becoming more and more important for our international competitiveness.

Heuermann: Getting rid of the age limit means, most of all, that the DFG's Head Office must shift from using merely formal criteria to a more quality-oriented decision, based on the review and scientific evaluation of a researcher's track record.

term outlook, they can find a university which suits their own innovative field of research. That switch should occur no more than between 18 months and 2 years of having begun the fellowship. This leaves sufficient time for researchers to prove themselves before the evaluation.

Who has applied so far?

Heuermann: I want to point out two groups in particular: Heisenberg fellows who take advantage of the possibility to switch, and leaders of Emmy Noether Independent Junior Research Groups.

Scholz: Our idea is to use the DFG funding chain to develop a model for a type of tenure track that is similar to the American tenure-track system. In that

Beate Scholz is a Programme Director in the DFG Research Careers Division.
Paul Heuermann is responsible for the DFG's Heisenberg Programme and advises applicants regarding procedural issues (Telephone: +49 228 885 2398, Email: paul.heuermann@dfg.de).

sense the Emmy Noether Programme is the equivalent of an assistant professorship. Junior research group leadership does not yet result in a permanent position. The Heisenberg professorship is thus the counterpart to the associate

So the DFG expects the university to make a clear commitment?

Scholz: Exactly. This is based on an idea similar to the Max Planck Society's Harnack Principle. That is, pick an excep-



professorship. In other words, researchers can use the consecutive links of the funding chain to attain qualification at the highest level, because at each step they undergo a strict scientific review. In addition to that, it's important to speed up the appointment process for professors. In a competitive global environment we cannot and should not keep our top candidates waiting too long.

Heuermann: Incidentally, our experiences so far show that the period between the DFG decision and the beginning of the Heisenberg professorship is only six months on average. This might be in part because some universities, to the extent that state regulations allow it, shorten the appointment process by including anonymised DFG reviews. It also helps speed up the process when university management is actively involved from the outset – because for the structure to evolve as intended, a professorship may have to be renamed or cut from another department. But the idea is definitely not to simply replace or duplicate an existing professorship.

tional scientist and structurally develop a new core research area around that person. Because the foremost purpose of the Heisenberg professorship is really to promote excellent individuals.

Heuermann: That's why universities can't apply. However, university management does play a key role in this process.

Scholz: An implicit goal of this funding programme is also to cultivate a mindset at universities that they should actively look all over the world for great minds that are of interest because of their innovative research. At the same time, the Heisenberg professorship is a model that is meant to encourage a tenure-track mentality in Germany. We have to make sure that the best scientists and academics can look forward to a secure career if we want to strengthen Germany as a research location.

Interview: Uschi Heidel

The Heisenberg Professorship

The Heisenberg professorship is an extension to the Heisenberg Programme. Like the fellowship, it prepares researchers for leadership positions. It offers candidates who prove themselves the reliable prospect of a professorship.

Young researchers find a university where they can establish a new area of research with their professorship. The host institution must demonstrate to the DFG that the establishment of the Heisenberg professorship will set a new research priority.

In the DFG review process researchers compete for a Heisenberg professorship. Only criteria of scientific excellence apply here. Around the same time, the host institution likewise examines candidates for the newly created professorship through its appointment procedure. If the university selects the candidate approved by the DFG, that person initially takes up a Heisenberg professorship.

After five years – following successful evaluation by the DFG and the university – this position converts into a tenured professorship.

The Heisenberg professorship, like the Heisenberg fellowship, is aimed at scientists and scholars who have attained eligibility for professorship via the Emmy Noether Programme, DFG-funded project staff positions, research in the private sector, or mid-level academic positions, as well as "junior professors", habilitated academics, returning German expatriates, and foreign researchers.

A Whole Lot of Freedom

Roland Strausz

is the first Heisenberg professor of economics

Economist Roland Strausz believes that mining is an apt metaphor for scholarly research: material is located, then extracted, hauled to the surface, sorted, processed, and marketed. The 36-year-old, who speaks eagerly and passionately about his profession, feels very much at home in the “pits”, because his academic ambition finds its greatest satisfaction in basic research. His prospecting work in the tunnels of scholarship – and this is where his mining analogy ends – has not gone unnoticed. The business paper *Handelsblatt* selected him in 2006 as one of the three strongest researchers under 40.

Inspired by everyday experiences

This may have been due to his impressive list of publications, but also because Roland Strausz often leaves the realm of abstract modelling to ask surprising real-world science questions. Thus he might investigate the role that durability plays in MP3 players for their success in the market; or why large enterprises can get bogged down in their internal communications; or whether a discounter should be required by law to stock minimum quantities of any bargain merchandise. Strausz is inspired by his own everyday experiences: “Should I buy another one of these wonderful espresso makers that are so easy to use and make such great coffee, even though the last one broke after a short time?” In other words, is quality not necessarily the same as durability?

These types of questions can be analysed with the tools of information economics. In order to advance and

apply them, Roland Strausz collaborates with other researchers such as his former teacher, Berlin economist Helmut Bester. Their focus is on information asymmetry between market partners. Modelling, analysing and ultimately forecasting this relationship is the purpose of this booming branch of research. Several Nobel Prizes have gone to information economists in recent years.

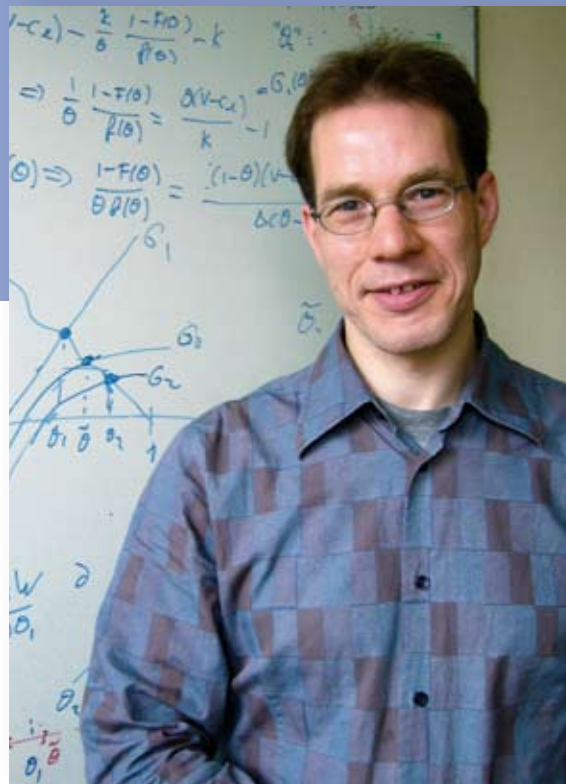
Roland Strausz’s preoccupation with information economics goes back to his student days in Tilburg, the Netherlands. In 1995 he followed Helmut Bester, himself a Heisenberg fellow in the 1980s, to the Free University of Berlin, where he habilitated in 2005. In 2006 he also received a Heisenberg fellowship. “That gave me a whole lot of freedom for my research,” says the Dutchman with a charming accent. In the 2007/2008 winter semester Strausz took up a Heisenberg professorship at

the Humboldt University in Berlin. He wants to expand his work on information economics and apply it to new problems – perhaps the issue of regulation for telecommunications or energy markets. But he lowers any expectations that his findings will be of use to policymakers any time soon; more work needs to be done first to develop universally valid models.

Creating his own environment

Roland Strausz enjoys living in Berlin with his family. His transfer from the Free University’s idyllic Zehlendorf campus to the Humboldt University in bustling downtown Berlin was only a job move. He looks forward to his new assignment. “The Heisenberg professorship”, says the economist, “allows me to create my own environment and gives me even more opportunities to further my research.”

Horst Willi Schors



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Getting to the Heart of Kidney Failure

Eva Brand

uses her Heisenberg professorship to investigate the genetic causes of disease



© Universität Münster

Eva Brand doesn't like to talk about her successes. Born in Marburg in 1966, the physician prefers to let achievements and results speak for themselves: in October 2006 the DFG made her the first female Heisenberg professor, and within six months the University of Münster converted her position into a tenured full professorship – a commitment that universities usually don't make until much later.

At the same time, the kidney specialist obtained a junior professorship, sponsored by the Donors' Association for the Promotion of Sciences and Humanities in Germany, and is involved in two major research projects. Together with colleagues she is building a register of 5,400 patients with coronary heart and chronic kidney disease, which is funded

by the German Ministry of Education and Research with more than one million euros. In addition she heads the German branch of a European Union study on the early identification of family members who are genetically at risk of high blood pressure and its corollaries, heart attack and stroke.

Heisenberg Programme allowed choice of location

Eva Brand was born into a family of medical doctors. Early on she realised her penchant for research. "I've always wondered why there's an accumulation of heart attacks or high blood pressure in certain families, even though the family members don't have the same lifestyle." Following her doctorate and her first years

as a junior doctor, Eva Brand went to Paris to investigate the genetics of high blood pressure, or hypertension. She was joined in the French capital by her future husband, who did research on the genetic causes of heart attacks. They got married in Paris. After a period of job-related separation in Ulm and Berlin, the couple and their four-year-old daughter now live in Münster. Eva Brand began working there as a chief consultant and deputy medical director. "It was a big coincidence that we both found suitable jobs in the same city," says Brand. The Heisenberg Programme allowed her to stay in Münster. Her research focuses on the relationship between vascular calcification and kidney failure. The background: more than six million people in Germany are affected by various stages of kidney disease, sometimes without knowing it. But only about 80,000 reach the last stage of the illness. They need blood dialysis several times a week because their kidneys have stopped functioning. "The vast majority of those who are in one of the preliminary stages die prior to that, because the risk of suffering or dying from a heart attack or stroke is up to twenty times higher in these patients than in healthy people," explains Eva Brand.

Prevention and therapy as research objectives

With her team at the University of Münster, the researcher tries to identify the genetic factors that accelerate calcification in patients with kidney problems and ultimately cause renal failure and cardiovascular incidents. It sounds simple, but it's complicated. The scientist has to uncover both the interplay between genes and environment, and the relationships between the genes themselves. "It's a challenge to my inquiring mind," says Eva Brand. Her objective is to develop concepts for prevention and therapy – in all her research, the focus is always on the patient. "I like to help people, and I'm happy to see them do better."

Katja Spross

Three Questions for

The Heisenberg Programme turns 30. What's your assessment?

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Annette Schavan

Federal Minister of Education
and Research, Germany

The Heisenberg Programme was initially intended to be a temporary instrument to keep excellent young researchers engaged in German academia prior to their first professorial appointment. Its success was so convincing that the programme ultimately became a permanent institution that facilitates the transition from training phase to professorial career.

The Heisenberg Programme has definitely helped us retain many highly qualified young researchers, across virtually all subjects, who would otherwise have gone abroad or into the private sector.

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E. Jürgen Zöllner

Senator of Education,
Science and Research, Berlin

The Heisenberg Programme is, without a doubt, one of the great success stories. And at the same time, it is one of the chief accomplishments of the DFG to have created a tool with this programme for promoting excellent young researchers, and for helping the somewhat less responsive university system meet its responsibility toward the next generation of scientists and academics. Its very success is a compelling reason to continue the Heisenberg Programme.

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Elmar Weiler

Rector, Ruhr University
Bochum

The Heisenberg Programme is the most brilliant programme for supporting top-level young researchers in Germany – a true success story. Numerous Heisenberg fellows have been offered professorships early in their careers. This shows that the programme has done a good job of picking the best.

Being accepted into the programme is a distinction of the first order and a seal of quality that plays an important role in appointment procedures. The Heisenberg Programme even enjoys an excellent reputation on the international stage.

To what extent can the Heisenberg professorship serve as a model for professorial careers?

The Heisenberg professorship is certainly a good tool for helping individuals enter a professorial career. But I believe the best model is still the regular process through which universities appoint professors, without transitional funding from a third party.

I wouldn't call it a model, because some German states have already introduced a tenure track, for example for "junior professors" – and that is a similar approach. In other words, the basic idea behind the Heisenberg professorship has been adopted by the regular system. Therefore, I don't see the Heisenberg professorship as a new element, but certainly as a welcome addition to the programme. Its distinction is definitely a very high standard of quality, which is guaranteed by the independence of the DFG and strict evaluation.

This professorship is definitely a model for the future. In June 2007, I already wrapped up the first Heisenberg professorship at our university with a short procedure, which led to the appointment of this colleague as Professor for Mechanical Engineering. This shows how universities can retain young researchers in subject areas where private businesses make very tempting offers.

What are the chances of tenure-track models becoming an integral part of HR development at German universities?

While I don't envision tenure track as the rule, I do consider it, in conjunction with a review provision, as an important instrument of HR policy in German universities. We have a lot of catching up to do in this area: only about 10% of all "junior professorships" were announced with a tenure track.

As a generation of German university professors is about to retire, we expect many openings in the next few years. To the extent that their budgets permit, universities could fill some of these jobs before they become available, in the form of parallel "junior professorships" with tenure-track approval. Those who prove themselves will then be able to take over. Several universities have developed such concepts under the Excellence Initiative. The funds recently approved under the Higher Education Pact 2020 could also be put to good use here. Such a concept would create a great opportunity for outstanding young researchers to grow into the system. But in addition to that, universities still need enough room to be able to appoint proven top-level researchers, both domestic and international, to permanent positions.

The tenure-track option is indispensable. My terms as Minister of Research in the Rhineland-Palatinate as well as here in Berlin demonstrate that I am very serious about this issue. All universities, which for good reasons are highly autonomous in their decisions, are well advised to take advantage of this instrument in a responsible way. But this also entails that there can be no automatism. Instead, researchers should be offered a permanent position after a successful evaluation, as is the case in the Heisenberg Programme. My impression is that strong university and department leaders do recognise the opportunities inherent in the tenure track. To retain top people they have to offer them not only effective working conditions but also life and career prospects.

I consider this development to be extremely important and promising. Talking with German scientists based in the United States, I quickly realised that the tenure track tops the wish list of young researchers considering a return. At the Ruhr University we pursue tenure-track models and indeed plan to expand them.

While junior professorships are controversial at many universities, our experience with them has been very good. It is clear that "junior professors" must have the same rights as professors. In Bochum several "junior professors" have already been appointed to associate and full professorships. This gives our university an edge, because it significantly increases our chances of attracting and retaining top-level researchers for the long term. A case in point: we were able to leverage a tenure-track professorship to retain a very successful colleague – an IT security specialist who was offered two other professorships, including one abroad.

Climate Archive at the Bottom of the Sea

Hildegard Westphal

delves deep
into the history of the Earth



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Bahamas, Tahiti, Minorca – for Hildegard Westphal these aren't vacation spots but regions where she investigates the composition of limestone at the bottom of the sea. This 39-year-old geologist and Heisenberg fellow specialises in paleoclimate research: she examines climate variations throughout the history of the Earth.

After her secondary education in Tübingen, Hildegard Westphal studied Russian and theatre, wanting to "do something else than the rest of the family." Her parents are both geologists, as are her grandfather, her uncle and her cousin. After one year at the Free University of Berlin she had gained enough distance, and studied geology after all, in Tübingen, of all places, where her father was a professor. "Tübingen had one of the best and biggest departments in Germany," she says, explaining her homecoming.

After one year abroad in Brisbane, Australia, she did her doctorate at the Research Center for Marine Geosciences (GEOMAR) at the University of Kiel. Then she researched at the University of Miami. In 1999 she went to Hanover, and later to Erlangen, determined to make a scientific career for herself in Germany.

"We're currently experiencing how ecosystems react and how rapidly climate change happens. That inspires me to new ideas," says Westphal. She investigates the facts that provide the basis for

climate-model calculations. Limestone features prominently here, because it is formed by organisms and is therefore a kind of climate record. For example, shallow-water corals in limestone point to tropical water temperatures, whereas other fossils are indicators of cold water.

New insights off the coast of Mauritania

But it's not the temperature alone that determines whether corals thrive. In January 2007 Hildegard Westphal collected samples from the sea floor off the coast of Mauritania. While the water is typically warm there, it is so rich in nutrients that corals won't grow; they need a low-nutrient environment. "If this floor sample were a geological record, it could easily be associated with cold water, which would be a false conclusion. Probably high-nutrient systems were much more common in the Earth's history than they are today, which means that many deposits have accumulated not in cold water but in nutrient-rich warm water, and that has been misinterpreted," explains the privatdozent. With her team she now wants to analyse these high-nutrient systems.

Rooted in German academia

Hildegard Westphal has received numerous awards for her research. In 2004 she was presented with the Albert Maucher Prize, which the DFG confers on outstanding young geoscientists. This was also the year in which she obtained her habilitation. Since 2005 she has been a Heisenberg fellow, which allows her "the freedom to combine family and good research".

The scientist is now with the University of Bremen, where her husband, a physicist, has been appointed professor. The couple turned down an attractive offer from the UK. "It's relatively easy to get a good job abroad. As a geologist, it's stressful to stay in Germany – so many positions are being cut," says Westphal.

The reason she keeps trying nonetheless has to do with her roots and a certain fighting spirit. "I grew up in German academia and feel at home here. As a member of the Young Academy I try to actively influence research policy."

Katja Spross

Bridge to a Career in Germany

Christof Rapp

believes in the relevance of ancient philosophy to today's discourse

Inspirational teachers of Latin, Greek and Hebrew at the grammar school in Rottweil, Germany, were the reason why 20-year-old Christof Rapp didn't have to think twice about what he wanted to study at university: philosophy, Ancient Greek and logic were his obvious choices. "As early as in the tenth grade we read texts by Greek philosophers that were exciting," he remembers. Awarded a prize for an essay about ancient philosophy as well as a scholarship, Christof Rapp studied at Tübingen and Munich, beginning in 1984. He had no career plans. It was all about his passion for the subject, and failure was an option. "I get one free round," was his adventurous attitude.

Between chairs

His university experience was mixed: at times the young man was overcome by a sense of being caught between chairs. Can philosophy actually be a profession?

In 1993, after he obtained his doctorate in Munich, he received an offer from Tübingen professor Otfried Höffe, who was looking for a specialist in ancient philosophy to complement his team. "That was the first time it occurred to me that I could actually become a professor," remembers Rapp, who at the time had already accumulated an impressive list of publications. He did indeed become a professor, at least as a substitute, in Basel and Berkeley. The year 2000, in which he completed his



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habilitation, turned out to be a decisive year for Christof Rapp. He taught in Berkeley, wrestled a bit with the reality of German academia, flirted with going abroad for good. Then, somewhat to his surprise, he was approved for a Heisenberg fellowship. "I had almost forgotten I'd applied. The fellowship for me was the bridge to a career in Germany," says the 43-year-old academic and family man today.

It was a bridge he crossed with determination. In 2001 he accepted a call to the chair of ancient and modern philosophy from the Humboldt University in Berlin, and later he became the head of its philosophy department. He chaired the Society for Ancient Philosophy and served as a DFG review board member. Since 2005 Christof Rapp has been Deputy Speaker of the Collaborative Research Centre "Transformations of Antiquity".

This interdisciplinary project brings together ten cultural studies fields from the Humboldt University, two subjects from the Free University, and the Max

Planck Institute for the History of Science, all based in Berlin. Fifty researchers collaborate on 16 projects. Rapp sees it as an interface between ancient philosophy and current intellectual challenges. "It's not about celebrating ancient philosophy in the humanistic sense as an unsurpassable apex," says the Aristotle specialist. Instead he wants to uncover the argumentative potential of ancient philosophy for today's debates – and analyse the repercussions of these insights on our understanding of ancient philosophy.

Appealing unity of lifestyle and profession

Aristotle believed that true happiness can only be attained by philosophers. Does Christof Rapp subscribe to this view? He argues that the unity of lifestyle and profession seen by Aristotle has long been a thing of the past. "That said, I'm not ashamed to admit that the classical philosopher's way of life does hold a certain appeal for me."

Horst Willi Schors

Making Europe Competitive

Dependable careers strengthen young researchers and universities

"The Heisenberg professorship is being perceived very positively across Europe because this programme is a signal against the fragmentation of the research community," says Dieter Imboden, President of the Swiss National Science Foundation (SNSF). He worries about the nascent European Research Area being dissected by the numerous programmes of national funding organisations and individual universities. "By promoting academic careers independently from local circumstances, the DFG takes a different approach. This gives funding recipients more flexibility within the European job market," says Imboden, who is also Vice President of the European Heads of Research Councils (EUROHORCs).

Kai Simons too looks at the European level when it comes to the promotion of young talent. "The clarity of the American-style career system continues to give the US an edge. Young researchers from India or China understand America's pipeline for excellence, but they're mystified by the way careers evolve in Europe." A molecular biologist with an international track record, Simons headed the Max Planck Institute of Molecular Cell Biology in Dresden for a few years, where he and his colleagues developed the "Dresden Model". Flat hierarchies, independent research groups, and directors who forego having their own departments, using the funds instead to create 20 junior research groups – all of this attracts scientists from around the world. However, the MPI cannot offer junior positions with a tenure-track option.

Kai Simons would therefore like to see his prestigious institution adopt its own graduated model in order to pave career paths for excellent young scientists.

He expects new opportunities for up-and-coming researchers to emerge thanks to the new European Research Council (ERC): "European universities will have to create transparent career structures if they want researchers with handsome ERC grants to come to them – and that will make Europe attractive worldwide."

No copy of the US system

Calls for a structured promotion of young researchers in Europe are not about copying US models. In 2000 the Swiss National Science Foundation introduced SNSF professorships. While SNSF professors are not guaranteed continued employment by their university after the five-year funding period ends, Dieter Imboden points to a successful record. "After five years, 80 percent of SNSF professors got permanent positions, either at their own or at another university. During this period they were able to show their strengths and often made themselves indispensable." The foundation president believes that the facts are persuasive: "Universities recognise that SNSF professorships at-

tract excellent candidates, and consequently they offer them an appropriate status with full integration into the institution." The benefits are obvious: these young academics bring funding and assume the rights and responsibilities of assistant professors. Thus they strengthen the profile of their university and the competition between universities. Imboden is convinced: "Programmes like Heisenberg and SNSF professorships help universities find the best people."

Universities make a commitment

So, in the Netherlands, too, dependable career paths for junior researchers have been under discussion since the late 1990s. In 2002, the Nether-





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traditional process,” says the research manager. Even researchers with a permanent position benefit from the Vici label – it allows them to better position themselves within their university and create jobs that often can’t be funded from the regular budget.

Meanwhile the NWO’s three-step funding model has been evaluated across the country, and the positive results provide a good basis for negotiations on the future of the programme. Anko Wiegel looks ahead: “The Vici volume needs to increase so we can effectively advance the careers of young researchers. Long-term success comes from a combination of all three funding stages.”

Isabell Lisberg-Haag

lands Organisation for Scientific Research (NWO) introduced a three-step programme called “Veni, vidi, vici”, which accompanies researchers throughout their careers. Following Julius Caesar’s motto “I came, I saw, I conquered”, NWO funding begins shortly after the doctorate (Veni), supports postdocs as they lead their own junior research groups (Vidi), and subsidises young professors and those on the path to professorship (Vici). “At the beginning of Vici funding, the participating university commits to hiring that researcher. It also outlines a career path,” explains Anko Wiegel from the NWO. These “senior researchers” may be funded with up to 1.25 million euros for 8 to 15 years after they earn

their doctorate, regardless of whether or not they currently hold a permanent job. This model has been well received. From 2002 to 2006, a total of 139 Vici positions were created; more than half of them went to young professors who had already been appointed.

Vici creates many jobs

“Each new Vici position creates three to four additional jobs because the money is used to establish research groups,” says Wiegel. About 800 young researchers have applied for the Vici programme so far; about 18% have been accepted. “Being a Vici professor is a seal of quality in the Netherlands. At this point it may often carry more prestige than an appointment through the

Further information:
<http://www.snf.ch/E>
<http://www.nwo.nl>
<http://erc.europa.eu/index.cfm>

Career Boost and Academic Freedom

“Heisenbergers” experience periods abroad as great opportunities



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“The Heisenberg fellowship came at the perfect time for me, and it couldn’t have gone better from a career point of view,” says Michael Stumvoll. In 2002 this medical researcher, equipped with a fellowship, transferred from the University of Tübingen to the National Institutes of Health, Metabolism and Nutrition Branch, in Phoenix, Arizona. Shortly after he returned from the US he was offered a full professorship at the University of Leipzig.

Michael Stumvoll, who had previously done research in California and New Jersey, thinks back almost wistfully to the extraordinary academic freedoms he enjoyed in Arizona: “No lectures, let alone night shifts, emergency room duty, and whatever else doctors usually have on their plate.” As a fellow abroad he felt a bit like a “private researcher” and was able to explore scientific side roads without having to produce findings that are immediately useful. Michael Stumvoll: “I also took the liberty of reading books about my research topics in a wider sense, knowing they wouldn’t end up in a proposal or a paper. I think I’ll be drawing on this for the rest of my career.”

Career boost, academic freedom, inspiring contacts, expansion of international networks – these are benefits that Heisenberg fellows mention frequently when they talk about their time abroad. They also often refer to

excellent working conditions, flat hierarchies, and opportunities to make informal contacts with other researchers, especially at American elite universities. “Open, pleasant, uncomplicated” is how mathematician Gitta Kutyniok experiences the atmosphere at Princeton University. “Big budgets and low administrative costs” noticed physicist Otto Dopfer in Basel.

Former “Heisenberger” Michael Kohlhase is now Professor of Computer Science at the Jacobs University in Bremen. His stay at the renowned Carnegie Mellon University (CMU) was “absolutely central” to his academic career. He also believes that having US credentials makes it much easier to gain access to leading American colleagues. Thanks to his connections with CMU, where he



Encouragement and practical support

Fellows are specifically encouraged to venture across borders and they receive practical support to do so: travel expense reimbursements, expatriation allowances and, for extended periods abroad, relocation allowances.

is still an Adjunct Associate Professor, Kohlhase was appointed full professor in 2003 at age 39.

Occasionally positive experiences abroad draw researchers permanently away from Germany. Cologne biologist Angelika Stollewerk, for example, spent her Heisenberg years in Cambridge, where she initiated research



Gitta Kutyniok

projects and was invited to give lectures. She still raves about the modern equipment in the laboratories. In summer 2007 the scientist left the University of Mainz, following a call to become senior lecturer at the University of London's Queen Mary College. Angelika Stollewerk: "I think my experience abroad in Cambridge was a big plus for the appointments committee."

lowship while I was abroad. It was my only chance to survive in academia and to get appointed to a university in Germany during my fellowship."

Inspiring exchange

Japanologist Kai Vogelsang is still abroad and full of praise for his excellent working conditions. Libraries in Kyoto are much better stocked for his subject and more accessible than any German state library. "I can really find everything I need for my research here." The informal exchange with his colleagues in Kyoto is a great inspiration for him: "In Germany I've found that the people in the department take little notice of their colleagues' research, whereas over here I've drawn a lot of inspiration from many conversations with others." He considers these new contacts as a great enrichment of his scholarship. Unencumbered by administrative tasks, he has ample freedom to conduct his research.

A similar experience is that of agronomist Jörn Bennewitz from Kiel, who has been working at the Department of Animal and Aquacultural Sciences in Ås, Norway. "At the German university I had substantial ongoing commitments such as teaching, advising students and doctoral researchers, writing proposals. Here I'm mostly excused from that and thus able to pursue my research." Without international experience, Bennewitz believes, the chances of securing a leading position aren't very good in Germany.

Mathematician Gitta Kutyniok, who habilitated in 2006 at the University of Gießen, went to Princeton in April 2007, then in October to the US West Coast, to Stanford University. "At both universities I can collaborate with leading researchers in my field on highly topical projects," she says.

In addition, Gitta Kutyniok is able to expand her international contacts by giving guest lectures, for example at Harvard and Duke, which she believes is the only path to participating in international research projects, let alone initiating them. And she is convinced that this will at some point also benefit her own junior associates: "Once I'm a professor with my own working group, these contacts will enable the best of my assistants to go abroad for highly rewarding research visits."

Horst Willi Schors



Kai Vogelsang

But many others are pulled in the opposite direction. Physicist Otto Dopfer, today a professor at the Berlin Institute of Technology, spent many years doing research abroad, for example in Japan, the Czech Republic and France, finally in Switzerland at the University of Basel and in the United States at the University of Georgia. "I applied for the fel-

Those Brief Moments of Understanding

Hélène Esnault und Eckart Viehweg pursue top-level mathematical research in Essen

“A mathematician’s daily routine may sometimes resemble that of a poet or philosopher. You sit, you draw little symbols, stop, think, draw some more, and stare. And at some point you’re overcome by a powerful feeling that this single idea might explain everything. Those brief moments of understanding are the climax of a mathematician’s life – absolute joy.” The two people who describe their work with so much enthusiasm are professors of mathematics at the University of Duisburg-Essen: Hélène Esnault and Eckart Viehweg, who have been living and working together for over 20 years.

So what exactly do they do? This is something the researcher couple has a hard time explaining to laymen. Just this much: they pursue “pure mathematics – basic research that is in no way applications-oriented”. Jointly, individually, or with other mathematicians, they have authored seminal papers on algebraic geometry and advanced their field of research by providing important impulses. The objects of their research are solution sets of equations, or more precisely: zero sets of polynomials. A special focus of their work involves the classification of all possible zero sets, something like an attempt to bring order into the hierarchy of geometric objects.

2003 saw Hélène Esnault and Eckart Viehweg jointly honoured with the DFG’s Leibniz Prize in recognition of their work. This most highly endowed

German research award allowed the mathematics couple to invest a total of 1.55 million euros in prize money into their projects through 2008.

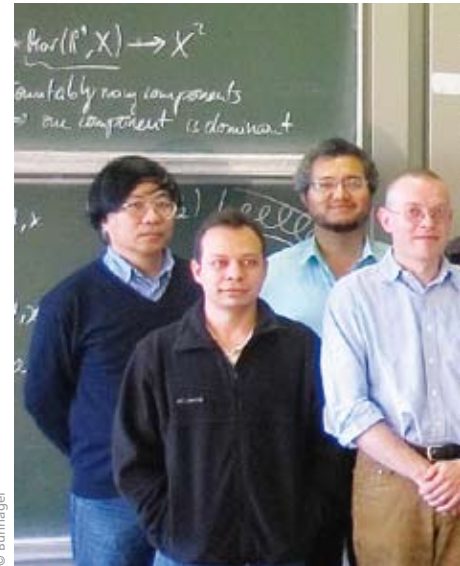
Rare constellation

“A maths couple holding two chairs at the same university is a rarity in Germany, perhaps even unique,” says Eckart Viehweg. “But it’s almost impossible to coordinate a move elsewhere together, so we’ve never even applied. Instead we’ve tried to help make the young University of Duisburg-Essen into an internationally recognised centre for mathematics.” And these two former Heisenberg fellows have succeeded in doing just that – in large part by raising DFG funding. Their working group on arithmetic geometry and numbers theory has produced many highly qualified mathematicians, with doctorates and

habilitations, and continues to involve young researchers from all around the world.

“Sometimes we get more postgrads than undergrads, and there are also quite a few researchers who earn their habilitation through us,” says Eckart Viehweg. Hélène Esnault adds: “A number of German mathematics professors used to be in our working group. All of this was only possible because of funding from the DFG – participation in Priority Programmes, in a Research Unit, and the Leibniz Prize.”

Hélène Esnault was born in 1953 in a blue-collar suburb of Paris. The daughter of a metalworker and a nurse, she studied mathematics in the 1970s at the École Normale Supérieure in Paris and then did her doctorate at the University of Paris VII. Following her ha-



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bilitation in Paris in 1984, she moved to Germany, first as a visiting researcher, then as a Heisenberg fellow at the Max Planck Institute for Mathematics in Bonn. She returned to the University of Paris for a year before she accepted the call to a full professorship of analytical geometry at the University of Essen in 1990. Originally the Frenchwoman didn't come to Germany for mathematical reasons – she points to her husband with a smile.

Eckart Viehweg, born in Zwickau in 1948, studied mathematics in Heidelberg, earned his doctorate in 1975, and habilitated in 1980 at the University of Mannheim. "In 1983 I was one of the first Heisenberg fellows, initially at the University of Paris VII, and then at the MPI for Mathematics in Bonn. After a year and a half I received an offer from the University of Essen," says Viehweg. Since 1984 he has held the chair of algebra there. One year later H el ene Esnault took up her Heisenberg fellowship. "I may have been the first mathematician from another country in the Heisenberg Programme, though I'm sure there were others after me. The Heisenberg Programme helps you get settled in Germany."

Recently a new Transregional Collaborative Research Centre has been set up in which these successful mathematicians play leading roles and tackle abstract mathematical problems, together with collaborators based in Mainz and

Bonn. The couple from Essen are also very active in the international arena, cultivating contacts with researchers in the US, Japan, Mexico, India, China and Vietnam, as well as in Europe.

H o-Hai Ph ung, for example, hails from Vietnam. Born in 1970, he too is a Heisenberg fellow today. Since 2003 this young mathematician has been a member of the working group headed by H el ene Esnault and Eckart Viehweg, who were able to use some of their Leibniz Prize money to invite him to Essen.

Building a bridge to Vietnam

H o-Hai Ph ung's special talent stood out even during his schooldays in Hanoi. A member of the Vietnamese team for the Mathematical Olympiad, he was only 17 and still at secondary school when he was invited to enrol at the Lomonosov University in Moscow, from where he graduated in 1992. After the collapse of the Soviet Union he continued his studies in Munich, where he obtained his doctorate at age 26. "When I came to Munich I didn't know a word of German. In the beginning I had a very hard time adapting," remembers H o-Hai Ph ung, whose mother is an astrophysicist.

A chance meeting with H el ene Esnault and Eckart Viehweg led to his invitation to Essen, where H o-Hai Ph ung now collaborates with Esnault on a research project. In 2004 he habilitated at the University of Duisburg-Essen and re-

ceived a Heisenberg fellowship the following year. "My academic future will probably be in Germany, but I do want to build a bridge to mathematical research in Vietnam. Who knows, maybe I'll go back to Hanoi one day with my family," says the Vietnamese, who lives in Essen with his wife and two sons.

A reason to stay would be the high regard his achievements have earned in Germany. In 2006 he was given the von Kaven Prize by the DFG for his outstanding research. During the award presentation at the annual conference of the German Mathematical Society, H o-Hai Ph ung pointed out that his mother had also received a research grant in Germany. It's possible, he said, that his two children will at some point be his family's third generation of bridge builders in German-Vietnamese academic relations.

The ultimate seal of approval

H el ene Esnault and Eckart Viehweg hope that the DFG will continue the Heisenberg Programme over the long term. "Without this programme we both wouldn't be in Essen today," says Eckart Viehweg. H el ene Esnault adds: "It's one of the greatest funding programmes for young researchers – a jewel in the crown of German academia. Especially in theoretical subjects such as mathematics the programme is at a very high level. It's the ultimate seal of approval for a mathematician."

Doris B unnagel

Confidence in the Potential of Young Researchers

From the first announcement to today

Since the Heisenberg Programme was first announced it has funded 2,036 fellows. Moreover, since the Heisenberg professorship was introduced in 2006, a total of 21 men and 4 women have become Heisenberg professors – 14 in the life sciences, 5 in the

natural sciences, 4 in the engineering sciences, and 2 in the humanities (as of October 2007). It appears that Heisenberg professorships are especially popular in the area of clinical research with its difficult framework for researchers. This is good news and

shows that medical departments are successfully using this instrument for their structural development. Of the Heisenberg professorships awarded so far, 13 were applied for directly, and 12 were converted from fellowships.

“A Piece of Paradise”

abbreviated version of an article by former DFG President Heinz Maier-Leibnitz, originally published in the Süddeutsche Zeitung on 14 January 1978

These days German researchers have reason to be a bit proud of their governments and their elected representatives, because a programme for young researchers is being announced that is internationally unique – the Heisenberg Programme. One hundred and fifty fellowships will be awarded each year to applicants who are young and demonstrate outstanding scientific and scholarly achievements. The idea is to enable them to be highly independent in their research and teaching.

What makes the programme so special is the confidence it places in young researchers and free research, who stand for

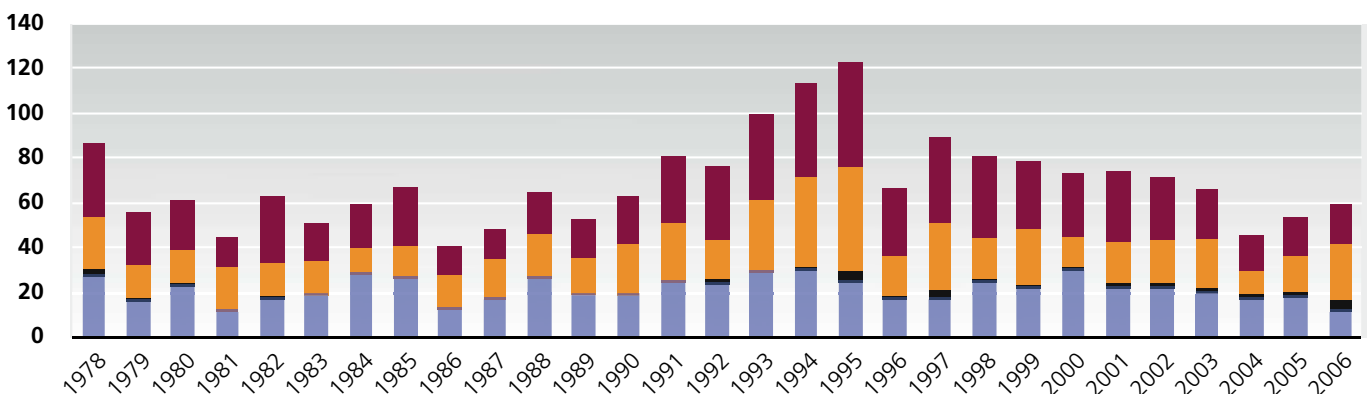
all the good researchers. We believe it is a good thing to allow some of the best to do whatever they consider most important and promising, unfettered by routine tasks. There is no attempt to tie them up in projects devised by others. There is no suspicion they might indulge in activities that serve no social purpose if they are left to decide their own work objectives. For a researcher, this is a piece of paradise. And for society, we are convinced, it is an opportunity that extends far beyond the circle of funding recipients. Why opportunity?

First of all we need to be concerned about research in Germany. There are several reasons for this. One is that research is

always a cause for concern. There is mediocre research, and there is good and very good research, but there is no research that couldn't be much better. Another reason – one that few people are aware of – is the crucial importance of outstanding work, of peak performance.

Research consists of many small contributions. But again and again, major steps forward are the results of solitary achievements. Yet solitary achievements are rare. There is certainly some truth to the malicious adage that only 5% of scientists think for themselves (which is not to imply that other professions are any better). Therefore we should be happy about anything that, like the Heisenberg Programme, promotes great independence and expects much in return.

It is probably safe to say that our higher education environment is not conducive to serene, carefree work. Given this situation,



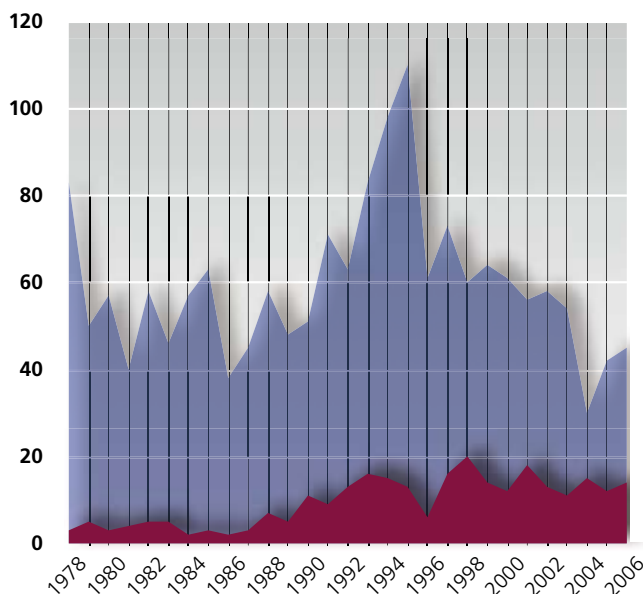


Chart 1

■ Women ■ Men

While female researchers were highly under-represented in the first round, their share was several times higher by 2006.

the Heisenberg Programme is meant to play multiple roles. First, it is geared to baby boomers, for whom there are especially few opportunities to work in academia and research because all the positions are being taken by relatively young people. We felt that fairness toward an otherwise disadvantaged generation demands that we take action here. Fellowships are awarded on the basis of achievements that indicate future scientific importance. Fellows are given full freedom of research and teaching. But the community in which they want to work must be willing to accept them.

This means they should not work in isolation; they should be part of a circle in which they learn and which learns from them, so that ultimately everybody will improve and cultivate a stronger sense of togetherness. We also hope that their freedom will inspire them to develop interest in the application of scientific knowledge. But all of this – more research, fairness, achieve-

ment, freedom, mutual influence, togetherness, interest in applications – is exactly what universities need most urgently right now. The modest funds of the Heisenberg Programme aim to accomplish much.

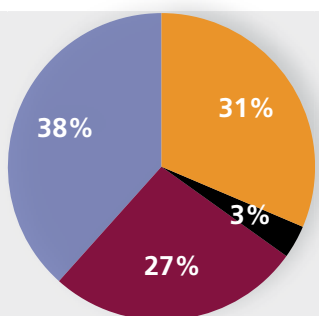
The Heisenberg Programme has been welcomed overwhelmingly by the academic community. Also in the political arena it has mostly been well received. Thanks to this, the programme has survived its journey through the committees. Such a course always lies between Scylla and Charybdis – in our case, mostly between the desire to do something for exceptional young researchers and research in general, and the tight financial situation along with the requirement not to disadvantage others by giving preferential treatment to an elite. That is why the financial endowment of the fellowships is relatively modest. Moreover, fellowships are limited to five years, at least for now, to make sure fellows have an incentive to accept other positions. This

has engendered risks for the success of the programme. On the one hand it is unthinkable for us to extend fellowships to any applicants but the uncommonly gifted and young. The programme is neither intended nor suited to solve social problems that stem from the fact that many researchers whose temporary contracts expire now have to look for work outside of academia.

On the other hand we must fear that too many, including especially the talented young ones, turn away from the programme because they aren't very sure of their abilities and therefore choose paths that promise more security for the future. Therefore we have to ask young researchers to trust the programme. The federal government and the states, with active support from many others, have created a programme that should be the envy of the world. Let's do what we can to make the best of it.

Charts 2 and 3

■ Natural sciences
 ■ Humanities and social sciences
 ■ Life sciences
 ■ Engineering sciences



Over the Heisenberg Programme's first 30 years, the natural and life sciences took up the greatest share, followed by the humanities. Engineering scientists were a small minority.

Heisenberg- Programm

Deutsche
Forschungsgemeinschaft

DFG

