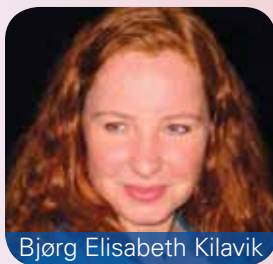




Norwegian University of Science and Technology

## Academic Opportunities in European Science

Scientists who wish to pursue academic careers in Europe have much with which to contend, especially now amidst an uncertain fiscal landscape. With much of the continent still at risk for a recession, there is legitimate reason to be anxious over the future of science funding in the European Union. However, buttressed by the European Commission, several member states, including Germany, the United Kingdom, and France, as well as Scandinavia, have plans in place to bolster scientific research and innovation, and make those regions attractive destinations for early and mid-career professionals looking for academic positions. **By Alaina G. Levine**



Bjørg Elisabeth Kilavik



Ryan F. Seipke



Jani Kotakoski

**T**his summer, the European Commission announced a €7 billion (US\$9.6 billion) investment in science, its largest funding package ever for research. This boost in science capital, up 9 percent from last year, is part of the European Union's (EU) Seventh Framework Programme for research and technology development (FP7), and will fund research that will "tackle the biggest societal challenges facing Europe and the world." It is expected to create approximately 174,000 jobs in the short-term and 450,000 jobs total, and nearly €80 billion (US\$113 billion) in gross domestic product (GDP) growth over 15 years.

This is good news for scientists looking for work in Europe. "An integral part of excellence is integration or mobility of researchers from many different nations," says **Michael Jennings**, spokesperson for Máire Geoghegan-Quinn, European Commissioner of Research, Innovation and Science. "We are investing in research and innovation in Europe and creating the conditions and priorities to better attract and retain scientists."

For academics who desire employment on this diverse and captivating continent, it is important to remember that while many aspects of European science are the same no matter which country you are in (for example, all EU scholars can apply for funds from the European Research Council [ERC]), there are also numerous differences that exist between the members states and their higher education systems. The postdoc appointment is one such illustration: "Although the concept of postdoctoral researchers is well understood,

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—Jani Kotakoski

there is considerable variability in job titles and in the practical organization of this stage in Europe," according to the 2010 European Science Foundation (ESF) Report, "Research Careers in Europe: Landscape and Horizons" (<http://scim.ag/qrFZHZ>). But one thing is consistent across borders: Opportunities for employment abound, as long as you know how to navigate the member states' systems.

### GERMANY: STRONG AND OPEN FOR BUSINESS

Germany, with a population of approximately 82 million, seems to be faring better than many of its EU neighbors **continued »**

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Andreas Pinkwart

during this economic tumult. According to the *Economist*, it is in a “comfortable” fiscal situation, “aided by a strongly growing economy will help to reduce the deficit without tough public spending cuts or tax rises.” **Cathleen Fisher**, president of the American Friends of the Alexander Von Humboldt Foundation, which promotes and supports the activities of the parent Humboldt Foundation, which provides exchanges between German and American scientists, echoes this sentiment. “Germany is in a relatively good position, having weathered the 2008 financial crisis quite well,” she states.

The nation is advancing in the midst of financial fragility for a variety of reasons, says **Andreas Pinkwart**, former minister for research in North-Rhine-Westphalia, and currently dean of HHL–Leipzig Graduate School of Management. “The German economy has learned to be very export-oriented and global-oriented.” For example, in the last five years, the government developed a ranking system for its universities in an effort to make them more internationally competitive, he adds.

This impetus to improve the higher learning institutes is one slice of a pie composed of three federal initiatives, which will support research and development, student funding, and university infrastructure. Each enterprise has its own time frame and budget, although the total amount exceeds €20.7 billion (US\$28.4 billion), and “guarantees annual budget increases of at least 5 percent for the largest science funding and science performance organizations,” explains **Max Vögler**, director of the North America Office of the German Research Foundation (DFG, Deutsche Forschungsgemeinschaft).

**Jani Kotakoski**, currently an adjunct professor of physics at the University of Helsinki, completed his postdoc at Technische Universität Darmstadt. His three-year contract was funded by DFG and focused on materials science and high-pressure physics. “I was interested in a permanent position in Germany,” he says, “but I was extremely unlikely to obtain one with the experience I had at the time.” By that point, Kotakoski explains, he had completed only one postdoc, which is not usually enough experience to be considered a top candidate—at least in a field like materials science where the competition is very tough.

He returned to his native Finland and rejoined the group from

which he had received his Doctorate. Now Kotakoski is on his way to a new position at the University of Vienna, “which is likely to greatly improve my research profile,” he says. “My view is that after two to three years there, I will be able to get a good position elsewhere, like Austria, Germany, Finland, or maybe other Nordic countries.”

For scientists interested in relocating here, Kotakoski advises interested parties to obtain contacts in advance and pursue a contract position. “One thing to also keep in mind is that the people who make the decision are the other faculty members,” he affirms. “Hence, you need to have something to offer—such as collaborations, expertise on topics which would complement theirs, or teaching experience—in order to be selected for a permanent position.”

With a known deficiency in tenure-track positions, and a distinctive tradition of requiring academics to complete a second thesis (called Habilitation) to even qualify for tenured employment, “Germany has tried to introduce new paths” toward landing these treasured jobs, says Fisher. “The addition of junior professorships as an alternative to the fulfillment of a Habilitation is one such route, depending on the institution and field.”

Furthermore, it is significant to note that in Germany, the Ph.D. is considered to be an acceptable entry point for industrial jobs. Vögler cites that with 2.4 percent of the German workforce holding Doctorates, compared to an estimated 1.4 percent in the United States, “there is no general expectation to go into academia,” he says. Pinkwart comments that approximately half the Doctorates go to work in industry versus academia.

### UK: GETTING BETTER ALL THE TIME

The United Kingdom is the third largest economy in Europe, after Germany and France, and is a scientific powerhouse that cannot be doubted: “With just 1 percent of the world’s population, the UK receives over 12 percent of citations to published papers..., and receives 10 percent of internationally recognized prizes each year,” according to its embassy’s website.

But only a decade ago, the government commissioned a study in which various problems that negatively affect the supply chain of scientific academic jobs were identified. “It appears that this is not an attractive career path for many of the brightest Ph.D. graduates. This is both harming the UK’s research base and causing recruitment and retention difficulties for universities,” according to the report led by **Sir Gareth Roberts**, a Welsh physicist. Among the challenges concerning postdoctoral and other contract research staff noted were: Uncertain career prospects associated with work on a short-term contractual basis, unsatisfactory training in the skills required in an academic career, and increasingly uncompetitive salaries.

Today, the UK system still has its troubles. But things seem to be getting better, and the nation continues to attract scientists from abroad to its noted institutions. Case in point: **Raymond E. Goldstein**, the Schlumberger Professor of Complex Physical Systems in the Department of Applied Mathematics and Theoretical Physics at the University of Cambridge. An American who arrived in the United Kingdom **continued »**

five years ago, Goldstein was a professor at the University of Arizona when he was appointed to the chair.

He admires the process to hire him. "Their interest in me was not the money I could bring in, but rather the science," he says. Goldstein appreciates that faculty are paid full-year salaries, as opposed to nine month salaries as seen in the States. "This is recognition that research is a fundamental part of your job," he adds. There is a mandatory retirement age (67, which may be changing), but many retirees keep their labs, supported by their pension.

For younger scientists eyeing careers in British academia, Goldstein suggests that the best way to get a job may be to do an early postdoc here. Indeed, this is something that **Ryan Seipke**, a senior research associate (essentially a postdoc) in the School of Biological Sciences at the University of East Anglia, is currently undertaking. Originally from the United States, he chose the United Kingdom for his training in part because he wanted to gain international experience. When his three-year contract ends in 2012, he can apply for another.

As he starts his job search process, Seipke notes a number of ways in which one could potentially join the faculty of an English university. One is to secure a postdoc-to-professor transition fellowship. These highly competitive, prestigious opportunities are offered by several organizations (private and governmental), including the Royal Society, Biotechnology and Biological Sciences Research Council, Leverhulme Trust, and Medical Research Council. "They are an unofficial stamp of approval to the university that you might be a star and successful in securing more grant money," opines Seipke. At the conclusion of the fellowship, he says, you are often offered a permanent faculty job.

**FRANCE: PUTTING SCIENCE BACK INTO THE HEART OF THE NATION**

The French Republic is the 20th largest country in the world by demography, but the fifth biggest scientific power with over 210,000 public and private researchers and, in total, almost 800,000 engineers and scientists nationwide, according to a report issued by its Ministry of Higher Education and Research. With a modern history of domestic scientific achievement dating back to the end of World War II, France has capitalized on its scientific assets with the adoption, in 2009, of a National Research and Innovation Strategy with a very specific and worthwhile goal: "To put back research and innovation at the heart of French society and economy."

Indeed, as the country transitions from an economy that incorporates more governmental control to one that is more autonomous, "France has strived to reshape the landscape



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—Cathleen Fisher

of higher education and research," says a French official involved in the management of bilateral cooperation programs. Initiatives include the creation of a new funding agency in 2005, the National Research Agency (ANR, *L'Agence nationale de la recherche*), a decentralization of universities to give them more independence, and financial incentives to internationalize laboratories, which is part of the "government push to attract faculty

from abroad," he describes.

One element of France's higher education is seemingly matchless in the EU: prior to the last five years, academia offered "only tenured positions" explains the French official. "Now we have contract positions also." This evolution, combined with the flexibility granted to the institutions to recruit and negotiate salaries for their research faculty, has helped the nation become more attractive to top scientific talent. But the completion of an in-country contract position is still the preferred route to obtaining a professorship.

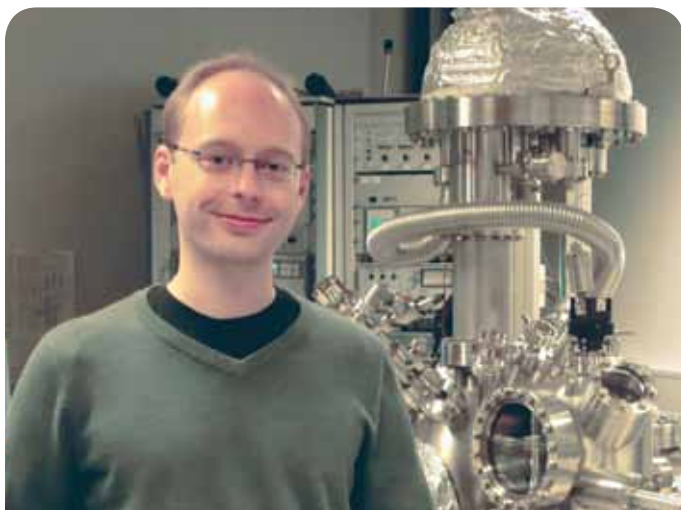
**Bjørg Elisabeth Kilavik** can attest to this manner of hiring. After completing a postdoc in Marseille, she will start a permanent job as a principal investigator/research scientist at the National Center for Scientific Research (CNRS, Centre National de la Recherche Scientifique). As an employee of the state, Kilavik will be subject to a mandatory retirement age, but she will not have teaching responsibilities, although this could change. "At these types of institutions, we are very privileged," she notes.

Kilavik realizes how attractive France is for academics seeking tenure. In Germany, where she completed her Ph.D., "I could maybe have gotten a five year contract as a junior professor, but there are few possibilities of getting a tenure-track position," she says. In France, "at least the permanent positions exist...which gives stability. More people in Europe are realizing...[France] is close to the only place where these positions exist."

**SCANDINAVIA: FAIRING WELL AND GROWING**

United by similar cultures and language, the Nordic countries of Norway, Sweden, and Denmark support internationalism and an ease of movement of scholars from one nation to another. Almost all universities are state funded, and grants are generally bestowed by the individual countries' research councils, either directly to a PI or through the PI's institution, depending upon the country and type of grant. While many other countries demonstrate fiscal distress, Scandinavia's economies are resilient. Norway has a budgetary surplus, and Sweden is debt-free. All three countries have annually increased spending on research and innovation for the last few years.

"We are so fortunate in Scandinavia, we are not **continued** »



Kristoffer Meinander

in an economic crisis such as in central and south Europe,” says **Mikael Lindgren**, a Swede who is currently a professor of optical sciences at the Norwegian University of Science and Technology. “There appears to be no lack of money in Norway for research and development in sectors such as energy, health, offshore and construction, only a lack of skilled labor.” Permanent academic jobs can be found throughout the region, although they are scarce in Denmark and Sweden because there are few universities in those countries. “In Norway it can be difficult to recruit ‘local’ Ph.D. students and postdocs because of the competition from the industrial and health sectors,” he remarks.

**Ylva Hellsten**, a professor of exercise and sports science at the University of Copenhagen, has been in Denmark for 15 years. She acknowledges the difficulty for foreigners in securing permanent academic positions in this former seat of Viking power, particularly those from outside of Scandinavian countries, who may be unfamiliar with the language. Furthermore, there are only eight universities, and “Ph.D. students typically stay within the Danish system for academic employment,” she says. However, the tide may be changing. In 2007, 10 percent of researchers at Danish universities were of foreign descent, states **Christian Lundager**, assistant to the director general of the Danish Agency for Science, Technology and Innovation (Forsknings- og Innovationsstyrelsen), but from 2007–2009, one-third of all new appointments at the assistant professor level or above were from abroad.

**Peter Byass**, a professor of global health at Umeå Centre for Global Health Research within Umeå University in Sweden, recently considered how the country might become more attractive to international researchers. He cites that while the nation of 9 million people boasts a positive working environment which emphasizes academic autonomy, public appreciation for science, and universal healthcare, there are still several hurdles to recruiting foreign scholars. For example, the academic

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en.fi.dk

Delegation of the European  
Union to the USA  
www.eurunion.org/eu

Embassy of France in  
the U.S.  
ambafrance-us.org

HHL-Leipzig Graduate School  
of Management  
www.hhl.de

National Center for  
Scientific Research (CNRS)  
www.cnrs.fr/index.php

North America Office of  
the German Research  
Foundation (DFG)  
www.dfg.de/en/dfg\_profile/  
head\_office/dfg\_abroad/north\_  
america/

Norwegian University of  
Science and Technology  
www.ntnu.edu

Seventh Framework  
Programme for Research  
and Technology  
Development  
europa.eu/legislation\_  
summaries/energy/  
european\_energy\_policy/  
i23022\_en.htm

Umeå Centre for Global  
Health Research  
www.globalhealthresearch.  
net

University of Cambridge  
www.cam.ac.uk

University of  
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www.ku.dk/english

University of East Anglia  
www.uea.ac.uk

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www.helsinki.fi/university

review process for senior posts can seem “unbelievably slow and complex to outsiders,” and it can be “hard for outsiders to understand expectations put on researchers,” especially given unfamiliar management styles, he says.

But with world-class research institutions and the ability to submit grant proposals in English, Scandinavia is an attractive option for international scientists. **Kristoffer Meinander**, a Swedish-speaking Finn who is a postdoc at the University of Aarhus in Denmark, says that foreigners may be surprised to learn the extent of scientific knowhow and funding for research infrastructure that exists here. “I wouldn’t have expected to find this high level in Scandinavia.”

Indeed, throughout Europe, international scholars are discovering its scientific assets are continuing to prosper even amidst an ambiguous economic landscape. And now with support from the European Union’s Seventh Framework Programme and related national initiatives, the continent seems poised to advance even further, creating more attractive opportunities for foreign scholars looking to contribute to its research endeavors.

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