

European Science, Engineering and Technology Highlights¹ JANUARY 2014

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¹ Note: If you would like additional information or background, please feel free to contact either Carine Polliotti at cpolliot@nsf.gov or Ana Helman at ahelman@nsf.gov

1 European Research Council Synergy Grants: 13 Exceptional Research Projects Awarded up to €15 million Each



The European Research Council (ERC) announced the winners of 13 Synergy Grants, who will share a total of €150 million (USD 206 million). The projects, at the crossroads of many disciplines, will receive funding of up to €15 million (USD 20.6 million) each for the coming six years. Each project brings together two to four outstanding researchers, which means that 45 scientists based in 11 countries are supported through these prestigious grants. This is the second competition for ERC Synergy Grants, which is a pilot scheme introduced in 2011 by the ERC Scientific Council.

The selected researchers will explore a wide variety of topics in all disciplines. The projects include: creating the first ever picture of a black hole; addressing the future of Internet security; evaluating the environmental impact of the lack of phosphorous; and developing new instruments for non-invasive eye treatments.

Compared to the first Synergy Grant competition, participation in this call was more in line with the expectations of the ERC Scientific Council: just under 450 applications were submitted, compared to over 700 in 2012. The success rate rose to 3%, from last year's 1.5%.

More information available at: <http://erc.europa.eu/>

<http://erc.europa.eu/>

2 Science Europe Publishes its Roadmap on European Research Policy

The 'Science Europe Roadmap' is the result of extensive discussion and consultation on a wide range of research policy areas between more than 50 research funders and performers from across Europe. *"I am proud that so many organizations, operating in very different environments, were able to come together to spell out their shared strategic vision"*, said Amanda Crowfoot, Director of the Science Europe Office.



The Roadmap identifies nine key areas where Science Europe Member Organizations intend to engage directly, to ensure collective progress towards a stronger European research system. These areas for action contribute to four strategic objectives that Member Organizations wish to pursue by collaborating: supporting 'borderless science', improving the scientific environment, facilitating science, and communicating science.

In order to face the challenges of an increasingly competitive global research environment, Science Europe member organizations are now committing to further increasing their efforts towards an even stronger and more efficient research system in Europe; this should be one where diversity is preserved as a strength, but where the conditions under which the research is conducted are adapted so that potential obstacles or unnecessary boundaries are removed.

The Science Europe Roadmap comes at a key time for European research policy. Over the coming years the European Research Area (ERA) will remain high on the agenda of the European Union institutions and Member States. The Science Europe Roadmap will contribute

to shaping the European research landscape, as well as providing a platform for concrete collaboration on areas that matter to research organizations and scientists: access to research data and to research publications, cross-border collaboration, gender and diversity issues, research careers, research infrastructures, research integrity, policy and program evaluation, and science in society.

The Roadmap is available for download at: www.scienceeurope.org/downloads

Note: Science Europe is the association of 53 Research Funding and Research Performing organizations from 27 countries, representing a combined research budget of approximately €30 billion per year. It was founded in October 2011 as a platform for collaboration between Member Organizations, both policy and activity level. More information available at:

<http://www.scienceeurope.org/news>



3 European Research Council Awards 575 million Euros to 312 Mid-career Researchers



European Research Council
Established by the European Commission

The European Research Council (ERC) has selected 312 scientists in its first Consolidator Grant competition for researchers with over 7 and up to 12 years' experience after their PhD. This new funding will enable the researchers to consolidate their own teams and to further develop their best ideas. Projects selected include: using a geochemical clock to predict volcanic eruptions, exploring the effects of Dark Matter and Dark Energy on gravitational theory, checking responsibility, liability and risk in situations where tasks are delegated to intelligent systems, and investigating the role of genetic and environmental factors in embryo brain wiring. Total funding in this round is €575 million (USD 778 million), with an average awarded grant of €1.84 million (USD 2.5 million), up to a maximum of €2.75 million (USD 3.7 million).

The ERC calls target top researchers of any nationality based in, or willing to move to, Europe. In this call, grants are awarded to researchers of 33 different nationalities, hosted in institutions located in 21 different countries throughout Europe, with 9 of them hosting five grantees or more. In terms of host institutions, the UK (62 grants), Germany (43) and France (42) are in the lead. There are also researchers hosted at institutions in the Netherlands, Switzerland, Spain, Italy, Israel, Belgium, Sweden, Austria, Denmark, Finland, Portugal, Greece, Hungary, Ireland, Turkey, Cyprus, the Czech Republic and Norway. In terms of researchers' nationality Germans (48 grants) and Italians (46) are at the top, followed by French (33), British (31) and Dutch (27) researchers.

Over 3600 proposals were submitted to this first separate ERC Consolidator Grant competition. The average age of the selected researchers is 39.

Full article available at: http://europa.eu/rapid/press-release_IP-14-16_en.htm?locale=en



4 European Commission Awards 50 million Euros for New Research Projects on Water Innovation



Biotechnology to treat heavy metal pollution in waste water; new 'Aquaponic' systems combining aquaculture and hydroponics in agricultural production; smarter management of water distribution networks. These are just three of 11 new projects approved for EU research funding, aiming to promote innovative solutions for water-related challenges. The projects involve 179 partners from research organizations and private companies (including more than 70 Small and Medium Enterprises-SMEs), across 19 European countries.

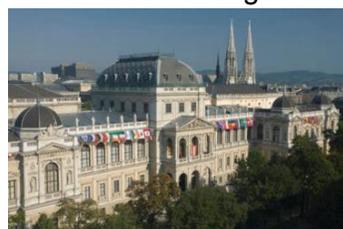
The €50 million (USD 68 million) in funding comes from the 2013 'Environment' call of the EU's Seventh Framework Program for Research and Technological Development (FP7). This brings total funding for water-related projects under FP7 (2007 to 2013) to more than €1 billion (USD 1.35 billion).

Securing safe and plentiful water supplies will remain a key objective under Horizon 2020, the new EU research and innovation funding program launched on January 1, 2014. Under the first Horizon 2020 calls for projects, published 11 December 2013, around €165 million (USD 223 million) is expected to be provided to projects in the focus area 'Water'.

Full article available at: http://europa.eu/rapid/press-release_IP-14-39_en.htm?locale=en



5 New Austrian Government Scraps Science and Research Ministry



The new Austrian government is integrating the country's Ministry of Science and Research into a Ministry of Economics and Family Affairs. The move has met with a storm of protest among academics and students. Like Germany, Austria went to the polls last September, and it has taken politicians in both countries two-and-a-half months to form new governments.

But whereas a conservative-social democrat coalition has taken over from the previous conservative-liberal government in Germany, Austria has seen a re-installment of the conservative-social democrat coalition that has been in power for most of the time since 1987 – except for a six-year conservative coalition with the ultra right-wing Austrian Freedom Party that started in 2000. Higher education and research is now the responsibility of the Federal Ministry of Economics and Family Affairs. A last-ditch attempt by Heinrich Schmidinger, chair of the Conference of Universities, to urge Austria's President Heinz Fischer not to swear in a government without a minister of science and research, failed.

The student union *Österreichische Hochschülerschaft* organised a 'funeral march' to the ministry. To demonstrate its disapproval of the new arrangement, the Conference of Universities called on all institutions to fly black flags.

Around 9,500 students held a rally in front of the Ministry of Science and Research in Vienna, calling for its retention. The city's major higher education institutions suspended lectures to

allow students to take part in the protest. There were further demonstrations in Graz, Salzburg and Klagenfurt. Another 'funeral march' was held in Innsbruck, with students wearing black.

Florian Kraushofer, chair of the student union, explained that the demonstrations were intended to show that higher education and research were not a priority of the new government and were being subordinated to business considerations. "But science follows a different logic," Kraushofer said. "Both in pure and in applied science, it has to be possible for research not to yield results. Science cannot always be profitable."

Full article available at:

<http://www.universityworldnews.com/article.php?story=20131218173225410>



6 French Academy Decries Slide in Research Spending



The French Academy of Sciences has issued its strongest distress signal in decades to warn against the consequences of recent declines in government research spending. The statement, released last month, is labelled as a 'cry of alarm' — and its message is expressed "in the toughest language the academy has ever used since I began my research career 45 years ago", academy vice-president Bernard Meunier told *Nature*. The document specifically denounces a cut of 12%, or about €80 million (US\$110 million), in next year's budget for the National Research Agency (ANR). The ANR cut will hit basic-research projects particularly hard, placing labs in peril and accelerating the 'brain drain', the academy says in its statement. The overall government research budget will lose €82 million, dropping to €7.77 billion, a 1% cut (not adjusting for inflation).

Some 85% of government subsidies to universities and research agencies are used to pay salaries, compared to only 47% in 1960, and little of the remainder is left over to finance labs' running costs once international commitments are met, Meunier says. "It is like having a fleet of police cars, but no petrol to put in them. The ANR cut is really the last straw that will break the camel's back," he adds. Higher Education and Research Minister Geneviève Fioraso dismissed the academy's fears as unfounded. Even though the ANR's 2014 budget is reduced, the funding agency will still be able to slate €600 million (US\$817 million) in projects that "represent the agency's capacity for commitment", she wrote in a letter to academy president Philippe Taquet. This accounts for a shift of €60 million from competitive project financing to lab operation costs, which rose by an average of 3% in 2013 and are being left unchanged in 2014, Fioraso added in the letter, which was seen by *Nature* but not made public.

Full article available at: <http://www.nature.com/news/french-academy-decries-slide-in-research-spending-1.14451>



7 Paris Beats London for Second Year Running in Student City Stakes



High tuition fees and cost of living have lost London the top place in the QS (Quacquarelli Symonds) Best Student Cities Index for the second year in a row, while North American cities fare less well than those in Europe, the Far East and Australia. The highest placed North American city is Boston, in eighth place after Singapore (3), Sydney (4), Melbourne and Zurich (joint 5), and Hong Kong (7). Montreal is ranked ninth and Munich tenth. The QS Best Student Cities index rates cities with two or more globally-ranked universities based on 14 criteria in five categories: university rankings, student mix, quality of living, employer activity and affordability. Each city receives a score out of 100 in each category, adding up to an overall ranking of the world's best cities for students. Paris has 17 universities ranked by QS – one fewer than London, which has the most.

Paris' high living costs are offset by relatively low tuition costs, high quality of life and a thriving student community. Graduates from the French capital's universities are in high demand among both local and international recruiters. In contrast, while its universities perform strongly in the global league table, London is let down by the affordability rating partly because of high tuition fees in comparison with Paris, given that it is not a cheaper place to live. London is also ranked lower for quality of living than the other top five cities. It does receive the highest score in the rankings category of the index, with 18 ranked institutions, including two within the world's top 10.

London also does well for employer activity and student mix and remains one of the world's most popular student cities, offering an impressive range of world-leading educational facilities within a buzzing hub of culture, nightlife and international diversity, according to QS.

In third position, Singapore reflects the increasingly strong performance of Far East universities in many areas. The city state rises nine places since the exercise was last carried out in February 2012, reflecting its growing reputation as one of the world's greatest student cities, despite having just two ranked universities – the minimum requirement for inclusion. Singapore's improvement is exceeded by Hong Kong – in seventh place – up 12 places since the last best student cities index. It offers relatively low daily living expenses and seven leading educational institutes, three of which rank among the top 40 universities in the world. Australia also does well, with Sydney just ahead of Melbourne. Quality of living and high scores in all categories except affordability (average tuition costs are higher than in London, although lower than in many US cities). Melbourne loses out to Sydney because of a slightly lower quality of living score, although this is still higher than either Paris or London. In addition to Paris and London, Europe is represented in the top 10 by Zurich and Munich.

Full article available at:

<http://www.universityworldnews.com/article.php?story=20131125120919479>



8 Serbia is a Rising Star in Astronomical Research



*Pavilion of Large Refractor
of Belgrade Observatory*

Pushing the boundaries of astronomy is only possible if you have the latest technology at hand. An EU-funded project aims to ensure that the Astronomical Observatory of Belgrade is equipped to become one of Europe's most dynamic and competitive centers of discovery.

The Astronomical Observatory of Belgrade (AOB) is one of the oldest and most distinguished scientific institutes in Serbia, which celebrated its 125th anniversary in 2013. While the observatory continues to be a regional center of excellence, participating in nine national research projects, with 20 principal scientists, it was recently acknowledged that an upgrade was needed to ensure that it was visible to other European researchers, and that it could participate fully in international research initiatives. This is why the Belissima project, funded through the European Union Seventh Framework (FP7) Research Potential program, was established, to enhance existing research capacities and to forge links with other institutions across Europe. The ultimate objective is to establish the AOB as the Balkan region's most dynamic and competitive center for astronomical and space sciences, with a truly European reach.

More information available at:

http://ec.europa.eu/research/infocentre/article_en.cfm?id=/research/star/index_en.cfm?p=ss-bellissima&calledby=infocentre&item=Infocentre&artid=31540



9 UK Reviews Engineering Skills

The Chief Scientific Advisor to the UK Department of Business, Innovation & Skills (BIS), Professor John Perkins has reported on his review of the provision of engineering skills in the UK economy. The review confirms the widely accepted view that a substantial increase in the supply of engineers entering the labour market would be of benefit to the UK economy, through helping the economy to be more flexible and resilient, and enable more people to take up the new opportunities offered by technological change.



*Professor John Perkins'
Review of Engineering Skills*



November 2012

The Perkins review includes 22 recommendations for action by government, industry, the engineering profession, and the education sector. Key messages include the need to inspire young people throughout their education and to improve the engineering skills supply system to help develop the types of engineer needed by current and future industries.

More information available at: <https://www.gov.uk/government/publications/engineering-skills-perkins-review>



10 The Role of Large Research Facilities in the UK



The report "Big Science and Innovation" by Technopolis Group, explores the role of large scientific research facilities in the UK and how they work with the innovation system, in the context of reduced capital funding stemming from the government's Spending Review 2010.

Central Laser Facility for ultrafast laser and Extreme Ultra Violet (XUV) science Artemis, Credit STFC

Large facilities are types of research facilities that combine large investments in state of the art equipment and associated infrastructure, often with large and highly-skilled operational support teams and related services. They are important tools for science, central to the ability to push the boundaries of what we know. Large facilities range from single sites like the Central Laser Facility to virtual labs like the Economic and Social Data Services.

The report provides a list of UK large facilities, and shows their important role in the national science and innovation system. It shows the substantial benefits that these large facilities bring to society, including:

- innovation required in their actual construction due to their cutting-edge nature
- marketable benefits such as patents and licenses
- non-marketable benefits such as new knowledge

Full report available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249715/bis-13-861-big-science-and-innovation.pdf

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