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NSF Weaves a Global Network

"Our goal is to promote international collaboration in materials research," said Carmen Huber of the U.S. National Science Foundation (NSF). Huber was explaining to *MRS Bulletin* the background to the Materials World Network (MWN), the NSF's program to promote international collaboration between materials researchers. NSF recently invited proposals for a new round of projects under the Network scheme.

"To bring forward the frontiers of the field, you need to make use of the talent wherever it resides," said Huber, program director in the Office of Special Programs of the NSF's Division of Materials Research. "Talent resides everywhere in the world." The MWN program taps into that talent pool.

NSF's partners in the program have also invited researchers to submit proposals. In the United Kingdom, for example, the Engineering and Physical Sciences Research Council (EPSRC), the leading funding agency for academic research in the physical sciences and engineering, has issued a call for new projects. The Australian Research Council, a new signatory to the MWN, has put out a similar invitation to its research community.

An important objective for NSF, said Huber, is to enhance the training of the next generation of researchers. As the Foundation's proposal document states, "Projects proposed to NSF are expected to offer students and junior researchers the opportunity to participate in an international research and education experience and, more generally, for integrating research and training in an international environment, and to clearly demonstrate the value added by the international collaboration."

Clive Hayter, director of EPSRC's materials program, said that the reaction from the United Kingdom's materials community has been "very positive." Working with groups in the United States, he said, gives U.K. scientists "exposure to state-of-the-art equipment." The United States, after all, leads the world in materials research, he said.

The flow of ideas is not, though, in one direction. Hayter said, "There are some areas where the U.K. could claim to be doing more exciting things than are going on in the U.S." There is also the view that when it comes to being adventurous, the United Kingdom is on a parallel with the United States. EPSRC was an early partner in the MWN scheme, which started four years ago. In the first round, in 2002, the Council received around 30 bids for support and funded four projects.

In all, NSF received 330 proposals and funded 65. Projects generally last three or four years. As Huber said, "…these are full research projects, not something you can do in a year."

It may be too soon to judge the success of the concept, but early projects are beginning to deliver results. In one project, a group led by Katherine T. Faber of Northwestern University in Illinois is working with researchers at the University of Seville and at the Polytechnic University of Madrid. The project involves using pyrolyzed wood to act as a scaffold for the growth of SiC-based ceramics.

In another project, Martin Sablik and

Germany's "nanoTruck" Presents Interactive View of Nanotechnologies

The "nanoTruck," a mobile exhibition designed to inform the general public about the world of nanotechnology, visited Brussels last May. The exhibit was devised jointly by the German Federal Ministry for Education and Research (BMBF) and the German Science in Dialogue (Wissenschaft im Dialog) initiative.

"A journey to the nanocosmos—a world of minute proportions" is the theme of the nanoTruck, which sets out to explain nanoscience and nanotechnology in terms that can be readily understood by young people and the public at large. Among distinguished visitors during the two-day stopover at the Cinquantenaire Park, close to Brussels' city center, were European Union Research Commissioner Philippe Busquin and Wolf-Dieter Dudenhausen, state secretary of the BMBF.

Some 60 m^2 of displays in the nanoTruck feature instruments that make atoms visible, vivid graphic panels, and examples of high-performance nanomaterials, nanobiotechnology, nanoanalytical devices, nanochemistry, and nanofabrication. A hands-on program includes guided tours through the exhibition, multimedia presentations, a laser show, and a play-and-win game on nanotechnology.

Since its launch at the end of January, the roadshow spent the next three months touring within Germany and participating in events connected with the German Technology Year 2004 initiative. Before Brussels, it had appeared at 29 locations and welcomed more than 35,000 visitors. By the end of 2004, it will have stopped at 95 different places on its resumed tour through Germany.

Wolf-Dieter Dudenhausen, state secretary of the German Federal Ministry for Education and Research, and Philippe Busquin, the European Union research commissioner, held a press conference at the nanoTruck exhibition in Brussels last May.

In conjunction with this initiative, a special brochure entitled "Nanotechnology—Innovation for Tomorrow's World" has been produced. The original German publication was prepared by the German Association of Engineers Technology Center (VDI-TZ). An English version is available from the European Commission Research Directorate General. Translations in Czech, Danish, Dutch, Estonian, Finnish, French, Greek, Italian, Hungarian, Lithuanian, Latvian, Maltese, Polish, Portuguese, Slovakian, Slovenian, Spanish, and Swedish are in progress. More information can be obtained from the nanoTruck Web site at www.nanotruck.de.

U.S. National Science Board Publishes S&E Indicators

"The Science and Engineering Indicators 2004" (NSB 04-01), a biennial report series published by the U.S. National Science Board, is designed to provide a broad base of quantitative information about U.S. science, engineering, and technology for use by public and private policymakers. Because of the spread of scientific and technological capabilities around the world, this report presents a significant amount of information about these international capabilities and analyzes the U.S. position in this broader context. The report can be accessed at www.nsf.gov/sbe/srs.

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Carlos Gutierrez of the Southwest Research Institute in San Antonio, Texas, are working with Ivan Falleiros of the University of Sao Paulo in Brazil to develop a physical understanding of the effect of plastic deformation and texture anisotropy on magnetic properties of ferromagnetic polycrystalline materials and to develop models that predict magnetic properties.

NSF hopes to sign up more countries to the MWN concept. Huber said, "We are trying very hard to get programs going in Asia, Africa, and countries in the former Soviet Union."

The European Union, which has its own R&D program, was an early signatory, as were a number of European countries in their own right. As well as Australia, this year's new partners include India and Israel.

As would be expected for any initiative that involves many countries, setting up collaboration involves ironing out differences in how organizations handle legal and administrative issues. For example Hayter highlights peer review as an area where countries differ.

Projects now require separate peer review in both partner countries. Ideally, said Hayter, there would be a single peer-review process, with both EPSRC and NSF accepting the outcome.

Huber agrees that it would be beneficial to have a less bureaucratic approach. However, as she said, "this is a young activity" and all of the partners already have their established ways of doing things. One issue where there are differences, she said, is in confidentiality arrangements around sending proposals to reviewers. However, she said, "We hope to get to a stage where you submit one proposal to one set of reviewers."

Huber said that the MWN is a unique activity within NSF. Most of the Foundation's international ventures are massive joint programs either of the sort needed to do science in remote places, such as the Arctic and Antarctic, or where the cost is just too big for the United States to assume alone—in high-energy physics and astronomy, for example.

Outside of these areas, said Huber, international collaboration is generally of limited scope and is restricted to setting up collaborations or seed funding. Rarely does the agency support full-blown research projects.

"I like to brag that it is only in the materials area where we support full collaborative efforts," she said.

MICHAEL KENWARD

Agreement Signed between DOE and CEA for Nuclear Energy Research

U.S. Secretary of Energy Spencer Abraham signed an agreement with France's Atomic Energy Commission (CEA) Chair Alain Bugat in August that will allow cooperation between the Department of Energy's (DOE) Office of Nuclear Energy, Science, and Technology and the CEA. The agreement specifically provides DOE access to the PHENIX fast spectrum test reactor, which has a capability that no longer exists in the United States.

Under the proposed arrangement, researchers at DOE and CEA will perform an experimental irradiation project in the PHENIX reactor. They will test various types of fuel loaded with minor actinides (highly toxic, long-lived material contained in spent nuclear fuel) under constant conditions and acquire data to permit selection of the best-performing fuel for future use in high-level waste transmuting systems.

New Zealand Joins Australian Synchrotron Partnership

The premier of Victoria, Australia, Steve Bracks, and New Zealand's minister for research, science and technology, Pete Hodgson, announced in August that New Zealand had agreed in principle to contribute $5 million (AUD) toward the Australian synchrotron beamlines.

Bracks said, "The Australian synchrotron, Victoria's biggest-ever investment in R&D [research and development] infrastructure, is running to plan, on time and on budget, to start working for the region's science and industry in 2007." The Victorian government is investing $157.2 million in the construction of the Australian synchrotron. The total cost of the facility, including an initial suite of nine beamlines, is $206.3 million.

"Science partnerships strengthened through the Australian synchrotron will boost Australian and New Zealand R&D, and help grow business and jobs on both sides of the Tasman," he said.

Hodgson said the Australian synchrotron would give the New Zealand science community ready access to an essential tool for groundbreaking research.

"Like Australia, New Zealand has so-called 'suitcase scientists' forced to go to the Northern Hemisphere to undertake leading-edge R&D. This new Australian facility will bring the tools they need much closer," Bracks said.

Victoria's innovation minister, John Brumby, said the funding commitment was "great news" for the project, on top of the over $20 million committed by Melbourne University, Monash University, the Commonwealth Scientific & Industrial Research Organisation (CSIRO), the Australian Nuclear Science and Technology Organisation (ANSTO), and the private microtechnology company MiniFAB.

New Zealand's contribution to the synchrotron will be funded equally by the New Zealand government and research providers, including universities and national research institutes.

Two of the proposed beamlines are principally for industrial and commercial use. The microdiffraction and fluorescence probe is of particular interest to the mining, manufacturing, and biotechnology industry sectors; and the lithography beamline is used for micro- and nanotechnology applications such as microsensors and miniature medical devices. Funding is being sought from industry to enable the construction of these two beamlines.

Currently, researchers in New Zealand use synchrotron facilities for work on a tuberculosis (TB) protein to help the search for new anti-TB drugs, new and more efficient materials for fiber optics, and cheese contamination. □

ESF Call for Proposals in "Novel Science"

The European Science Foundation (ESF) Standing Committee for the Physical and Engineering Sciences (PESC) announces a call for proposals to address "Novel Science" in one or more of the following fields: chemistry, physics, mathematics, information sciences and technology, engineering sciences, and materials sciences and engineering. Multidisciplinary proposals based in these areas are also welcome. For the current list of ESF/PESC programs, see http://www.esf.org/pesc/programmes.

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