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ASTRA Faces Toughest Budget Climate Yet

Now in its third year of existence, the Alliance for Research in Science and Technology for America (ASTRA)—a nonprofit advocacy organization for the physical sciences—is facing one of the toughest federal budgetary climates in recent memory. While federal science research and development (R&D) funding hit a historic high of \$103.76 billion for FY2002, the biggest gains were realized by the National Institutes of Health (NIH), the Department of Defense, and counter-terrorism initiatives. With the economy still weak and the nation recovering from a costly war with Iraq, federal funds are scarcer than ever. The outlook for FY2003 and beyond appears bleak for the scientific enterprise, according to Robert Boege, ASTRA's executive director.

ASTRA President Mary L. Good of the University of Arkansas, Little Rock, initiated the establishment of the alliance in late 1999. She envisioned a body that would unite industry, scientific and professional societies, coalitions, and universities to lobby for substantial and sustained increases in federal investment in mathematics, physical sciences, and engineering research. The Alfred P. Sloan Foundation and the David and Lucille Packard Foundation provided startup funds, and ASTRA receives much of its current support from professional societies and associations, including the Materials Research Society (MRS), one of ASTRA's founding members.

From the outset, ASTRA faced an uphill battle in making the case for federal investment in science. By FY1999, federal



Members of the Alliance for Research in Science and Technology for America (ASTRA) joined other researchers in a briefing session for Congressional Visits Day (CVD), April 2–3, 2003. The presentation was given by the American Association for the Advancement of Science in Washington, D.C. This was the eighth annual CVD event organized by the Science-Engineering-Technology Work Group.

funding levels for physics, the geological sciences, and chemical, electrical, and mechanical engineering were down 20% or more from 1993 levels, according to Good, citing a 2001 study by the National Academies of Science Board on Science Technology and Economic Policy (STEP). While materials engineering enjoyed minor funding increases in the 1990s, since 1998 the field has experienced steadily declining support.

Apart from setting up its basic organizational structure, the biggest challenge ASTRA had to overcome in its infancy was finding common ground among its various constituent members, each of which had different and sometimes competing objectives.

"Our view is, if you raise all the boats,

everybody participating is going to be able to move upward," said Good. "We've tried to find areas where the interests overlap, which is not difficult when you stick to advocating for an increased pool of research dollars for these disciplines."

The hard work has begun to pay off. Good said that the organization has found that the best mechanism for making an impact on Capitol Hill is to form groups with balanced representation from industry, academia, and scientific societies, and to that end, ASTRA has sought out industry partners to round out its membership. The organization currently has 54 members, with participation from 25 corporations, roughly half of which are dues-paying corporate members. ASTRA also played an important role advocating on behalf of the National Science Foundation Authorization Act [H.R. 4664], signed by President Bush in December 2002, and was asked to testify before the President's Council of Advisors on Science and Technology (PCAST) on several occasions. PCAST's final report, calling for a balancing of the federal research investment portfolio, incorporated many of the recommendations from ASTRA representatives.

This April, for the first time, ASTRA participated as an organization in the eighth annual Congressional Visits Day organized by the Science-Engineering-Technology Work Group. With a total of 230 individuals drawn from 36 groups (including ASTRA) participating, the year's round of visits covered 38 states and amounted to roughly 200 meetings, including more informal interactions.

"For the first time in the two years I've been working for the ASTRA effort, I heard that our message was getting through," said Boege. "We're finally starting to make

NSF Releases Program Solicitations for MS&E

The National Science Foundation (NSF) has released two program solicitations for materials science and engineering.

The program **Cooperative Activities in Materials Research** between NSF and the European Commission is a continuation of the cooperative program initiated in 2000. Two categories of proposals are solicited: (1) to support the U.S. side of innovative collaborative research with scientists from the countries of the European Union and affiliated countries, and (2) to develop electronic networking among centers to facilitate cooperation and interaction between materials researchers in the United States and the European Union. More information can be obtained at Web site <http://www.nsf.gov/pubs/2003/nsf03565/nsf03565.pdf>.

The program **Partnerships for Research and Education in Materials** is designed to improve and strengthen the education infrastructure in materials research and to increase recruitment, retention, and degree attainment by members of groups underrepresented in materials research. The activity will produce models for developing long-term materials education and research relationships between minority-serving institutions and Materials Research Science and Engineering Centers and other groups, centers, and facilities supported by NSF's Department of Materials Research. More information can be obtained at Web site <http://www.nsf.gov/pubs/2003/nsf03564/nsf03564.pdf>.

a strong case to Congress for increasing the R&D budgets, in spite of the deteriorating fiscal situation." Encouraged by that success, Boege hopes to mobilize ASTRA members to visit their representatives locally during the August congressional recess. A potentially useful tool for that effort is the customized state fact sheets compiled by ASTRA, detailing the R&D funding situation in each individual state.

ASTRA is also concerned about workforce issues and education, believing that waning R&D funding will affect not just the scientific community but the entire nation, leading to potential shortages of qualified professionals in science and engineering in the United States and to a decline in the country's technology base. Good insists there is incontrovertible evidence of a connection between federal research funding for scientific research and the number of degrees earned in science and engineering disciplines—an assertion that is borne out by a forthcoming study in *Science* by Merrilea Mayo, director of the Government-University-Industry Research Roundtable (GUIRR) and 2003 MRS president.

However, that issue has proven slightly more contentious among the ASTRA membership, particularly in light of the poor economy and many layoffs over the past two years, most notably in the engineering sector.

"Everyone agrees that we must continue to produce high-quality scientists and engineers, but some people get hung up on the fact that we're facing some employment issues at the moment," said Good, who pointed out that retirement rates will begin to increase rapidly in the next few years, while physics and engineering enrollments continue to decrease, with larger fractions of graduate students in particular being drawn from outside the United States. "If you don't keep feeding the pipeline, there won't be a sufficiently qualified technical workforce to meet U.S. needs when the economy does start to improve," she said.

In the current dismal budget climate, advocacy groups like ASTRA are needed more than ever, says Boege. While the NSF Authorization Act was approved, appropriators have yet to release any funds, and the overall funding picture for the scientific research enterprise "does not look promising," he said, pointing to decreases in four or five key budget areas, particularly the Department of Energy's Office of Science. Even the life sciences are receiving considerably less funding for FY2004, after years of substantial increases, and FY2003 ended with what is now estimated to be an over-

all \$240 billion deficit. "We're allocating scarcities again, and the fiscal situation is still deteriorating," said Boege.

Although science currently enjoys nominal strong support in Congress, particularly in the Senate Commerce, Science and Transportation Committee and the House Science Committee, Good recognizes that some compromises will most likely be made because of the scarcity of federal funds.

"The worst of all possible worlds would be if science funding lost ground; to my mind, that would be a disaster," she said. "So we're going to make our pitch in every possible avenue we can find that might have an impact, and we're going to have to be more intense in our efforts just for science to break even in the current budgetary climate. We'll continue to make the case that science is an investment the U.S. simply can't afford not to make."

JENNIFER OUELLETTE

India Launches Nanomaterials Initiative

In March, the Ministry of Science and Technology in India launched the Nanomaterials Science and Technology Initiative (NSTI) to promote research and development in nanotechnology. A funding amount of Rs. 100 crore (~\$21 million) has been earmarked for this in the 10th Plan. The initiative envisages participation of industry, both the public and private sector, in the venture.

The ministry said that nanotechnology promises widespread applications in the areas of health and biotechnology, electronics, information technology, and materials. The synthesis of nanomaterials and assembly of nanostructures into ordered, functional arrays are crucial aspects of nanoscience. Nanoscale materials and structures that will be explored through this initiative include nanoparticles, nanowires, nanotubes, nanostructured alloys and polymers, nanoporous solids, and DNA chips. Besides conventional tools like x-ray analysis, specialized instrumentation such as scanning probe microscopes, high-resolution electron microscopy, and magnetic force microscopy are required to carry out the research.

Australia Strengthens University Research Partnerships with China

On March 31, Brendan Nelson, Australia's Commonwealth Minister for Education, Science, and Training, announced awards totaling \$585,000 given to strengthen research partnerships between universities in Australia and

China. The awards include the Chinese Higher Education Strategic Initiative (CHESI) proposal for 2003–2004 by the University of Sydney and Nanjing University to conduct research on nanostructural analysis and materials design.

The Australian initiative aims to promote education, training, and research cooperation between the universities; to raise the profile of Australia's research and education system within China; and to promote a greater awareness of the benefits of working together. Two-way research exchanges are encouraged through a range of activities including on-site visits and postgraduate research training opportunities in China.



Julia Higgins Appointed Chair of UK Engineering and Physical Sciences Research Council

This past February, Julia Higgins (DBE, FRS, FEng), professor of polymer science at Imperial College London, accepted an appointment as the new chair of the Engineering and Physical Sciences Research Council (EPSRC) in the United Kingdom.

"I am delighted to welcome Dame Julia Higgins as the new chairperson of EPSRC," said EPSRC chief executive John O'Reilly. "As a member of the Council when EPSRC was first established, her knowledge and experience of both the 'science' and 'engineering' facets of our research community will be most valuable to us, and I look forward to working with her."

Higgins' research career began in 1968 when she obtained a DPhil degree in physical chemistry from the University of Oxford. She then worked at the University of Manchester, the Institut Charles Sadron in Strasbourg, and the Institut Laue-Langevin in Grenoble before taking up a lectureship at Imperial College, becoming a reader in polymer science in 1985 and then professor four years later. Higgins is familiar with EPSRC, having been a member of the Council and the Resource Audit Committee from 1994 to 2000. Her current research work at Imperial College involves studying the behavior of complex materials, particularly polymers, in terms of their molecular structure, organization, and motion. She is director (a part-time role) of the recently formed Graduate School of Engineering and Physical Sciences at Imperial College. □