

Bush Approves Funds for Superconductive Magnetic Energy Storage Initiative

President Bush has signed into law legislation reinstating funds for the Pentagon's superconductive magnetic energy storage (SMES) initiative, which is expected to provide information about a number of advanced materials. The program, which the administration had originally requested be discontinued in fiscal 1992, has been reinvigorated by Congressional action with \$40 million now appropriated. SMES is a cutting-edge technology through which energy could be stored in a football-sized facility by utilities for use in time of need.

The SMES engineering test module (ETM), the goal of the program, may well provide the testbed for high-temperature superconducting materials. This would come via short cold-to-warm leads composed of wire going from low-temperature superconducting materials to high-temperature superconducting compounds. Such leads would allow a portion of the storage unit to be cooled with liquid nitrogen, much less expensive than the primary coolant liquid helium. The novel leads could make the ETM up to two percent more efficient. Leading high T_c candidate materials include the yttrium-barium-copper oxides and the bismuth-strontium-calcium-copper oxides.

When the SMES program was shifted from the Strategic Defense Initiative Organization to the Defense Nuclear Agency (DNA) several years ago, DNA program manager Jon Farber suggested the low T_c to high T_c potential. That has recently been confirmed by James Daley, Department of Energy superconductivity program manager in the Office of Conservation and Renewable Energy.

The ETM may also provide valuable data on how well fiberglass structural materials operate in cryogenic conditions, according to Jim Lowe, program manager for Ebasco Services, Inc. The ETM could also yield important data regarding multilayer insulation to be deployed in cryogenic conditions, he said. Lowe heads one of the two teams competing on the project. Life-cycle stress/strain relations will be one area of study. The other team bidding on the job is from Bechtel Corp.

The SMES program has progressed to the end of its first phase, which called for extensive designing of the ETM by both teams. The measure signed into law calls for a quick decision on which team should build the ETM, a process called downselecting. The estimated cost to build the ETM has been placed at \$280 million.

SMES was originally proposed for the

dual uses of storing energy for utility use and providing energy to fuel free electron lasers as part of a defense against intercontinental ballistic missiles. However, with the lessening likelihood of global attack, the administration felt the primary military mission for the unit was no longer viable.

NMAB Forum Addresses Materials Commercialization

On November 6, 1991, the National Materials Advisory Board (NMAB) hosted a forum on Accelerating the Commercialization of Materials for Competitive Products at the National Academy of Sciences in Washington, DC. Keynote addresses were presented by Senator Jeff Bingaman (D) of New Mexico and Karl Erb of the Office of Science and Technology Policy (OSTP).

Senator Bingaman identified two areas which will be critical to the United States—new materials synthesis and materials processing. He outlined several deficiencies that currently exist in these areas due to several factors, including lack of government policy in this area, weak education in manufacturing engineering, and the short-term focus of U.S. industry. Bingaman is one of the co-sponsors of the Defense Authorization Bill which includes the National Critical Technologies Act and a Manufacturing Bill. [See the October 1991 *MRS Bulletin*, p. 20.] These bills should provide new funding for materials processing and synthesis (\$15 million), and include such projects as the Critical Technology Application Centers in geographic areas to support specific industries. In addition, some funds (\$30 million) would be provided for education in manufacturing engineering and management.

Karl Erb, who reflected the views so often expressed by D. Allan Bromley, also mentioned that materials science is on the critical technologies list. In addition, he emphasized four special areas targeted by OSTP—miniaturization, design of structural materials, biomaterials, and environmentally benign materials.

Representatives from industry, universities, and government also expressed their views. Speakers included the following: James C. Williams, General Electric Company, "Issues in Materials Commercialization"; Joel P. Clark, Massachusetts Institute of Technology, "Criteria for Materials Commercialization"; William E. DeGenaro, 3M Company, "Creating an Innovative Climate for Materials Commercialization"; Peter R. Bridenbaugh, Alcoa Laboratories, "Materials Commercialization: Supplier Industry's View"; G. Harri Narayanan, Boeing Company, "Materials Commercialization: Manufacturer Indus-

try's View"; Thomas J. Murrin, Duquesne University, "An International View of Materials Commercialization"; Robert W. Selden, Los Alamos National Laboratory, "A National Laboratory's View of Materials Commercialization"; Richard L. Dunn, Defense Advanced Research Projects Agency, "Commercialization of Federally Supported Research: The Legal Environment"; Robert A. Laudise, AT&T Bell Laboratories, "Wrap Up and Next Steps."

The forum will be summarized in a report to be prepared by the NMAB. For more information contact: Klaus M. Zwilsky, Director, NMAB, Harris Bldg. 262, 2101 Constitution Ave. NW, Washington, DC 20418; phone (202) 334-3497.

NRC Announces 1992 Research Associateship Programs

The National Research Council is seeking applications for the 1992 Resident, Cooperative, and Postdoctoral Research Associateship Programs for research in the sciences and engineering to be conducted on behalf of 30 federal agencies or research institutions whose 115 participating research laboratories are located throughout the United States. The programs provide opportunities for PhD scientists and engineers of unusual promise and ability to perform research on problems largely of their own choosing yet compatible with the research interests of the sponsoring laboratory. Initiated in 1954, the associateship programs have contributed to the career development of over 6,500 scientists ranging from recent PhD recipients to distinguished senior scientists.

Approximately 300 new full-time associateships will be awarded on a competitive basis in 1992 for research in chemistry; earth and atmospheric sciences; engineering and applied sciences; biological, health, and behavioral sciences and biotechnology; mathematics; space and planetary sciences; and physics. Most of the programs are open to both U.S. and non-U.S. nationals, and to both recent PhD degree recipients and senior investigators.

Awards are made for one or two years, renewable to a maximum of three years; senior applicants who have held the doctorate at least five years may request a shorter period. Annual stipends for recent PhDs for the 1992 program year range from \$27,750 to \$42,000 depending upon the sponsoring laboratory, and will be appropriately higher for senior associates.

Applications to the National Research Council must be postmarked no later than **April 15 and August 15, 1991**. Awards will be announced in July and November.

Information on specific research opportunities and participating federal laboratories, as well as application materials, are available from:

Associateship Programs (GR430/D2)
Office of Scientific and Engineering Personnel
National Research Council
2101 Constitution Avenue, NW
Washington, DC 20418
Fax (202) 334-2759

NSF Notes

Funding Announced for First Six Alliances for Minority Participation

In an effort to substantially increase the number of minority students receiving bachelor's degrees in science, engineering, and mathematics, the National Science Foundation has awarded grants for cooperative agreements to six universities from its Alliances for Minority Participation (AMP) Program.

Awards were made to the University of Alabama at Birmingham; Arizona State University; University of California, Irvine; Jackson State University (Mississippi); Texas A&M University; and the University of Puerto Rico. These institutions have established partnerships with other universities, community colleges, national laboratories, government agencies, private companies, and other institutions in order to establish far-reaching networks with educational opportunities for minority undergraduate science, engineering, and mathematics students.

Each alliance was selected because of its cohesive, collaborative strategy and specific goals. Under the program's guidelines, the alliances will:

- Establish partnerships among colleges and universities; school systems; federal, state, and local government agencies; major national science and engineering laboratories and centers; industry; private foundations; and professional organizations;
- Improve the attraction and retention rates of minority students in undergraduate science, engineering, and mathematics education to increase the number of minority students receiving undergraduate degrees in these areas;
- Develop an infrastructure and management plan among participating organizations and institutions that will ensure long-term continuation of AMP or similar activities beyond the term of NSF financial support; and
- Develop specific evaluation plans and procedures for assessing both qualitative and quantitative progress toward the achievement of the AMP Program's goals.

100 Awards Go to Women Science and Engineering Faculty

To increase the number of women moving into senior ranks and positions of leadership in U.S. colleges and universities, the National Science Foundation has selected 100 outstanding science and engineering professors to receive Faculty Awards for Women. The awards total \$5.0 million and

are intended to recognize the accomplishments of women in research and teaching and to provide them with funding to facilitate their further development as leaders. Each award consists of a grant of \$50,000 per year for five years to support research activities.

Awards were distributed among biological, behavioral, and social sciences (32); mathematical and physical sciences (24); engineering (23); computer and information sciences (11); and geosciences (10). Awards were made to 57 institutions (92% were research institutions and 8% were predominantly undergraduate institutions) in 27 states, Guam, and the District of Columbia.

The award recipients were selected through a review process that focused on the accomplishments of the candidates and their potential to contribute to the future of the nation's scientific and engineering effort. Four recipients are MRS members: Diana Farkas, Virginia Polytechnic Institute; Lorna J. Gibson, Massachusetts Institute of Technology; Jeanne E. Pemberton, University of Arizona; and Angelica M. Stacy, University of California, Berkeley.

For information about this program and others, contact:

L. Rogers
Women's Programs
National Science Foundation
1800 G Street, NW
Washington, DC 20550
phone (202) 357-7456

MRS University Chapters are located at:

- Alabama A&M University
- Alfred University
- Carnegie Mellon University
- Cornell University
- Johns Hopkins University
- Massachusetts Institute of Technology
- Northwestern University
- Pennsylvania State University
- Rensselaer Polytechnic Institute
- Stevens Institute of Technology
- Texas A&M University
- University of Alabama
- University of Arizona
- University of California, Berkeley
- University of California, Los Angeles
- University of Florida
- University of Maryland
- University of Michigan
- University of Minnesota
- University of Pittsburgh
- University of Wisconsin - Madison

For information about these University Chapters, their officers and activities, call Anne Wagner, MRS Headquarters, (412) 367-3003.

Second North Alabama Materials Research Student Conference

Hosted by Alabama A&M University Chapter of the Materials Research Society
April 11, 1992, Huntsville, Alabama

For more information contact: Eric Williams, Deon Williams, or Leslie Evelyn at AAMU University Chapter of MRS, Department of Physics; phone (205) 851-5866; fax (205) 851-5868.

Co-sponsored by Alabama Space Grant Consortium, MRS (Alabama), ASM (Huntsville), and EPSCoR (Alabama).