

## Materials Science Policies and Programs in Japan

A Study by the Science Section of the U.S. Embassy in Tokyo

Detail-filled 23-page report describes and analyzes the extent and focus of the Japanese government's contributions—both current and planned—to advanced materials R&D. Policies, programs, funding, technologies, materials, and goals are identified.

### Contents:

- Capsule history of the Japanese government's approach to technological/industrial development, its materials science policies, and stated goals.
- Ministerial Materials Science Policies—basic descriptions of a special coordination fund for promoting science and technology, the Science and Technology Agency (STA), the Ministry of International Trade and Industry (MITI), and ministry goals; policy recommendations of the Council for Aeronautics, Electronics, and Advanced Technologies.
- Materials Programs in STA, MITI, Other Ministries—programs, topics, funding, expectations.
- International Cooperative Research Activities.
- Government-Industry Connection—examples of how Japan's government encourages industry participation in commercializing research.
- Future Plans—cites a systematic study by Japan's Economic Planning Agency which forecasts the timing for practical use of 101 future-oriented technologies in nine technology areas over the next 20 or more years, and their effects on society and the economy.
- Implications for the U.S.—with specific recommendations.

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## Brown Voices Support of AMPP, Tech Transfer with Former Soviet Union

In a one-on-one interview with the *MRS Bulletin* on March 10, Representative George Brown (D-CA) described himself as a friend of materials research and as particularly interested in the growth and development of advanced materials.

Brown, who chairs the House Science, Space, and Technology Committee, voiced his support of the Bush administration's recently announced materials initiative. The Advanced Materials and Processing Program (AMPP) is "an excellent, cost-cutting initiative," he said, and should provide "a little funding boost and important focus" for the advanced materials so identified. AMPP should also help provide a better understanding of the commercial applications for some of these materials, something we don't have a good grasp on, said Brown.

The Science Committee will call witnesses, including presidential science adviser D. Allan Bromley, to gain a better understanding of AMPP. It will also attempt to conduct oversight, although, as the Science Committee Chair explained, this will be more difficult since the cross-cutting initiative involves multiple agencies and several departments will have to be monitored.

AMPP's visibility and support is remarkable, considering the continuing squeeze in the budget, said Brown. "There is very little room for new programs and some older programs are being cut."

Brown criticized the inability of U.S. industry to develop long-term strategies, noting that the failure to do so is hurting the country's ability to compete internationally.

A similar criticism was leveled by the Competitiveness Policy Council in its first annual report issued March 1. Describing a "steady erosion of the country's economic performance," the report says that pushing this decline are the "perverse incentives that permeate American society," such as tax laws that penalize savings and a political process that rewards spending and tax cutting rather than prudent savings. The report also criticizes the nation's inability to think globally.

The Bush administration is not doing nearly enough to promote technology sharing with members of the former Soviet Union, said Brown. Regulations dampening the ability of U.S. companies to do business with the Commonwealth of Independent States in areas such as fiber optics communications are ludicrous, he said.

Brown has proposed a binational founda-

tion to promote technology transfer from the former Soviet Union. He also is holding a series of at least six video conferences between the Science Committee and key scientists remaining in what was the U.S.S.R.

"Fully one quarter of the 'scientific workers' on the planet now reside in the republics of the former Soviet Union, and more than half the world's engineers work there," said Brown. "The Soviet peoples have a long tradition of scientific and technological excellence."

A blue-ribbon panel strongly endorsed Brown's demand for a binational foundation, noting that a "brain drain" will occur without such stimulation. The panel concluded that "cooperative projects with U.S. scientists and engineers will encourage former Soviet Union specialists to remain in place and to help in building a civilian market-oriented economy." Members of this panel, the Working Group on Basic Research included Frank Press, president of the National Academy of Sciences; Ashton Carter, director of the Center for Scientific and International Affairs; and Guyford Stever, commissioner of the Carnegie Commission on Science, Technology, and Government.

Brown criticized the highly publicized National Technology Initiative (NTI) as being politically motivated at a time when the nation needs concrete leadership. The NTI is a nationwide effort launched by the Bush administration to encourage U.S. industries to cooperate more closely with each other and the federal government.

## Doe Notes

### Tech Transfer from DOE Labs Shows Increase

The U.S. Department of Energy (DOE) reported a sharp increase in transfer of technological innovations from DOE laboratories to commercial uses by private companies.

In a letter transmitting the annual report to Congress on technology transfer results, Energy Secretary James D. Watkins cited the number of new Cooperative Research and Development Agreements (CRADAs) as evidence of the "rapid growth of industry interest in working with DOE's laboratories."

"Thirty-seven new CRADAs were approved in FY 1991," he said, for a cumulative total of 43 CRADAs approved as of the end of the fiscal year. As of March 6 this year, 92 CRADAs had been approved, reflecting approval of 49 new CRADAs since the end of FY 1991.

CRADAs are only one of the mechanisms U.S. business can use to take advantage of DOE research facilities and expertise to develop more competitive commercial products and services. CRADAs have received increasing emphasis, however, because of policies that encourage direct relationships between companies and DOE labs and legislation that protects research results from public disclosure for periods up to a maximum of five years.

The transmittal letter to Representative George E. Brown Jr., chairman of the House Committee on Science, Space, and Technology, also identified a 168% increase in the number of patent licenses granted by DOE laboratories in the last four years (to a total of 125 in FY 1991) as further evidence of successes in technology transfer.

Watkins cited as especially significant some recent agreements with industry to develop batteries that will make electric cars widely available by the year 2000, and agreements with a consortium of 120

small, medium, and large businesses to cooperate in research and development critical to manufacturing.

Watkins also noted the Department's role in the administration's recently launched National Technology Initiative (NTI). The purpose of this interagency effort, he said, "is to promote U.S. industry's use of technology to strengthen the domestic economy and to compete in global markets."

**\$50 Million Added to Tech Transfer Program**

The DOE is proposing to transfer an additional \$50 million in FY 1992 for efforts to accelerate the transfer of technology from its national labs to the private sector.

DOE's proposed FY 1993 budget asks for \$117 million for technology transfer, up from \$69 million in FY 1992. The \$50 million additional will come from DOE's nuclear weapons program to pursue research in promising dual-use technologies at the national laboratories and to enhance tech-

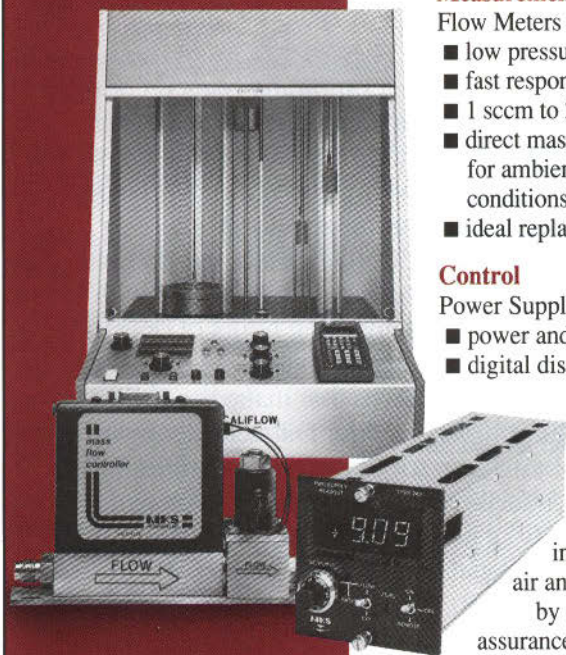
nology partnerships with U.S. industry in such areas as materials research and development, high-performance computing, specialty metals and ceramics, lithography, advanced manufacturing, and other advanced technologies.

**Postdoc Research Program to Begin at National Laboratories**

A new program will provide postdoctoral research opportunities at the DOE national laboratories. The Distinguished Postdoctoral program has been established to provide outstanding postdoctoral scientists and engineers with opportunities to participate in full-time advanced research in the physical, engineering or computational sciences, areas most critical to DOE.

Fellowships, including a \$52,800 stipend, will be awarded to scientists who have already earned their doctorates in one of these areas. Up to 10 fellowships will be awarded each year, and may be extended for up to two additional years. Selection of awards will be made by panels of experts

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within the discipline, including DOE laboratory scientists and others.

Participating DOE facilities include: Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Continuous Electron Beam Accelerator Facility, Fermi National Accelerator Laboratory, Idaho National Engineering Laboratory, Lawrence Berkeley Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, National Renewable Energy Laboratory, Oak Ridge National Laboratory, Pacific Northwest Laboratories, Princeton Plasma Physics Laboratory, Sandia National Laboratory, Stanford Linear Accelerator Center, and the Superconducting Super Collider Center.

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## NSF Notes

### \$30 Million Will Fund Engineering Education Coalitions

The National Science Foundation has funded two new university coalitions, the SUCCEED and Gateway coalitions, to revolutionize the education of engineers.

Each new coalition has been awarded \$15 million over a five-year period, with matching funds provided by participating academic institutions and their industrial partners. The coalitions will substantially restructure curriculum and courses, and increase participation by women, under-represented minorities, and people with disabilities in the field.

Formed from diverse institutions, the coalitions include historically black schools, public and private universities, small institutions that concentrate on undergraduate education, and major research universities with large graduate programs.

The Gateway Coalition will encourage engineering students by focusing on four broad areas: curriculum structure, human potential and development, instructional technology and methodology, and quality assurance and evaluation measure. SUCCEED (Southeastern University and College Coalition for Engineering Education) plans to achieve a 50% increase coalition-wide in the enrollment and graduation rates of female and under-represented minority students.

Both coalitions will emphasize engaging students in engineering from the day they matriculate; making the study of engineering more attractive, exciting and fulfilling; developing students as emerging professional leaders; increasing the diversity of academic backgrounds and the number of women, under-represented minorities and people with disabilities in the field; and drawing engineering faculty to an investment in the teaching of undergraduates.

**Gateway Coalition Members:** Case Western Reserve University, Columbia University, Cooper Union University, Drexel University, Florida International University, New Jersey Institute of Technology, Ohio State University, University of Pennsylvania, Polytechnic University, and University of South Carolina.

**SUCCEED Members:** Clemson University, Florida A&M University/Florida State University, Cooper Union University, Drexel University, Florida International University, New Jersey Institute of Technology, Ohio State University, University of Pennsylvania, Polytechnic University, and University of South Carolina.

The addition of Gateway and SUCCEED brings to four the total number of university coalitions funded. The first two coalitions, Synthesis and ECSEL, were established in 1990.

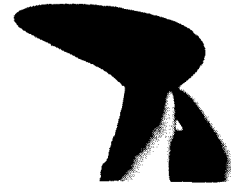
## SDI Announces 205 SBIR Awards

The Strategic Defense Initiative's Small Business Innovation Research (SBIR) program recently announced the selection of 205 awards to 143 small high-technology businesses. The awards are for feasibility studies of innovative ideas that have both military significance and civilian spinoff potential. The businesses will receive an average of \$53,400 and, on completion of the feasibility study, will become eligible to compete for followup research awards of up to \$500,000.

Awards were made in 14 broad classes of technology: directed energy, kinetic energy, sensors, nuclear space power, non-nuclear power, propulsion and logistics, thermal management, survivability, computing, optical computing, space structures, structural materials, electronic materials, and superconductivity.

A list of firms and titles of their feasibility studies is available. Circle No. 76 on the Reader Service Card. □

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