Incorporating WASHINGTON NEWS and policy news from around the world.

NIST Launches Advanced Measurement Laboratory

Considered the most technically advanced research facility of its kind, the new Advanced Measurement Laboratory (AML), dedicated on June 21 at the U.S. Commerce Department's National Institute of Standards and Technology (NIST), will support some of the most delicate experiments in nanotechnology and measurement at the atomic level. Commerce General Counsel and Deputy Secretary Designate Theodore W. Kassinger, Sen. Paul Sarbanes (D-Md.), Rep. Chris Van Hollen (D-Md.), and Dr. John H. Marburger III, director of the White House Office of Science and Technology Policy, were among the participants in the formal opening ceremony at the NIST campus in Gaithersburg, Md.

The $235 million facility covers 49,843 square meters (536,507 square feet) in five separate wings—two of them buried 12 meters (39 feet) under ground—with stringent environmental controls on air quality, temperature, vibration, and humidity. The new facility allows NIST to provide the sophisticated measurements and standards needed by U.S. industry and the scientific community for key 21st century technologies such as nanotechnology, semiconductors, biotechnology, advanced materials, quantum computing, and advanced manufacturing.

"At the end of the day, our nation and our citizens will be safer, healthier, and more productive as a result of the work that will be done here," Kassinger said. He noted that the United States faces challenging global competition, stating, "We need every edge we can get; combined with our talented, dedicated personnel, this laboratory is an edge like no other."

The construction of the AML was itself a research effort, even before ground was broken in June 2000. Institute scientists created "testbed" laboratories to try out concepts for some of the building's most exacting specifications in temperature and vibration control. While the majority of the building's laboratory spaces can be temperature-controlled to within a quarter of a degree Celsius, some highly isolated laboratory modules can be controlled to within a hundredth of a degree.

Special features of the facility include:

- 338 reconfigurable laboratory modules;
- A Class 100 (3.5 particles per cubic liter of air) cleanroom—the 8520 square meter (91,700 square foot) nanofabrication facility that will be operated as a user facility for research by industry, government, and academic researchers;
- Enhanced air quality—air fed to the AML laboratories is filtered with HEPA (high-efficiency particulate air filter) technology, delivering about a thousandfold improvement in air cleanliness over NIST's existing general purpose laboratories;
- Temperature control—from baseline temperature control within ±0.25°C to within ±0.1°C or ±0.01°C for 48 precision temperature-controlled laboratories;
- Vibration isolation—from a baseline velocity amplitude of ≤3 μm/s down to 0.5 μm/s in 27 low-vibration modules;.
- Humidity control—from a baseline of ±5% down to ±1% in special laboratory sections;
- Electrical power filtering—a facility-wide uninterruptible power supply, to prevent outages and to counter voltage spikes, dropouts, and other "dirty power" problems that limit accuracy and precision, reduce analytical sensitivity, and cause long-running experiments to crash; and
- "Green building" features—natural lighting, energy conservation, and recycling are emphasized in the AML's design and operation.

NIST's research efforts planned for the new facility range from improved calibrations and measurement of fundamental quantities such as mass, length, and electrical resistance to the development of quantum computing technology, nanoscale measurement tools, integrated microchip-level technologies for measuring individual biological molecules, and experiments in nanoscale chemistry.

NIST's new Advanced Measurement Laboratory is the most technically advanced research facility of its kind in the world. The $235 million facility covers 49,843 square meters (536,507 square feet) over five separate wings with stringent environmental controls on air quality, temperature, vibration, and humidity.

U.S. ITER Project Office to be Located at Princeton Plasma Physics Laboratory

The U.S. Department of Energy announced in July that the U.S. project office for ITER, an international fusion experiment, will be located at Princeton Plasma Physics Laboratory (PPPL). PPPL is located on Princeton University's James Forrestal Campus in Plainsboro, N.J., and is charged with developing the scientific understanding and key innovations that will lead to an attractive fusion energy source.

PPPL, in partnership with DOE's Oak Ridge National Laboratory (ORNL), will be responsible for project management of U.S. activities to support construction of this international research facility. These activities will include securing technical assistance from the U.S. fusion community; procuring and shipping U.S. hardware contributions; arranging for U.S. personnel to work abroad at the ITER site; representing the U.S. in the international ITER organization on construction and preparation for ITER operations; and coordinating and integrating the U.S. fusion community's ITER project activities with the international ITER project.

"The United States and our international partners are in talks to launch ITER, a critically important experiment to test the feasibility of nuclear fusion as a source of electricity and hydrogen," Secretary of Energy Spencer Abraham said. "Throughout its history, Princeton Plasma Physics Laboratory has earned a reputation for the highest-quality science and top-flight management."

The ITER international fusion experiment was priority one in *Facilities for the Future of Science: A Twenty-Year Outlook*, a proposed portfolio of 28 new facilities and upgrades of current facilities that Abraham released in November 2003 as a roadmap for future scientific facilities to support DOE's basic science and research mission and to help the department plan its future scientific investments.

A fusion power plant would produce

https://doi.org/10.1557/mrs2004.157 Published online by Cambridge University Press

no greenhouse gas emissions, use abundant and widely distributed sources of fuel, shut down easily, require no fissionable materials, operate in a continuous mode to meet demand, and produce manageable radioactive waste.

There are two competing sites to host the research facility. The European Union has selected Cadarache, France, as its candidate site; Japan's contender is Rokkasho. The United States supports the Japanese site.

Europe to Identify Strategic Research Agenda for Nanoelectronics

The European Commission's report "Vision 2020: Nanoelectronics at the Centre of Change" (Vision 2020) recommends that Europe lead the transition of the microelectronics sector to the next generation of nanoelectronics, with coordinated public and private investments of at least €6 billion per year. The report by a high-level group on nanoelectronics consisting of CEOs of leading companies and research organizations was presented on June 29 to European Research Commissioner Philippe Busquin and Enterprise and Information Society Commissioner Erkki Liikanen.

As reported by the European Commission, smarter and smaller nanoscale electronics, managing vast amounts of data, are becoming key components for applications ranging from household appliances and consumer goods to automotive transport, health care, security, and ultimately ambient intelligence. In response to Vision 2020, the European Nanoelectronics Initiative Advisory Council (ENIAC) will be chaired by STMicroelectronics President and CEO Pasquale Pistorio, who served on the high-level group. This European public–private partnership will identify and implement a strategic research agenda for nanoelectronics in Europe.

"Nanoelectronics is a strategic sector for Europe, with a potential for creating a significant number of highly skilled jobs and boosting growth and competitiveness in most other industrial sectors," Liikanen said. "Today's strategic initiative is vital if Europe's industry is to remain at the forefront of global developments."

"Europe cannot afford to miss the next generation of electronic applications that will be for our future economy what oil is for today's economy," Busquin said. "Leading the transition to nanoelectronics is a challenge that requires our best researchers to work together and our public and private investors to profit from economies of scale. Smaller and more functional electronic components make complex electronics disappear and help people to be creative and fully participate in the knowledge society."

In 2002, funding for microelectronics in the Asia-Pacific region reached 62% of total capital spending, whereas it amounted to only 8% in Europe. The report can be accessed on-line at ftp://ftp.cordis.lu/pub/nanotechnology/docs/e-vision-2020.pdf.

South Africa Launches Center of Excellence in Strong Materials

In July, South Africa's National Research Foundation (NRF) announced the launching of six Department of Science and Technology (DST) Centres of Excellence, including one in strong materials, in Pretoria. The Centre of Excellence Programme is managed by NRF.

The DST Centre of Excellence in Strong Materials is hosted by the University of Witwatersrand in Johannesburg. The center studies materials such as hard metals, metal alloys, metal oxides, ceramics, diamond and diamond-like materials, and composites including carbon nanotubes. Strong materials retain their distinctive properties under extreme conditions and thus have wide applications in the manufacturing and mining industries in South Africa and abroad.

According to the NRF, improving the properties of currently used materials for higher efficiency and cost reduction is critical. In the longer term, the burgeoning fields of advanced strong materials being newly synthesized or in the process of further development are of great potential commercial value. This center will address both objectives, and its various specific programs fall within an area identified as being of major importance in the Advanced Manufacturing Technology Strategy of the South African government.

International Technology Transfer Days to Focus on Biomaterials

The 4th International Technology Transfer Days, to be held in Erfurt, Germany, November 4–5, 2004, will address biomaterials. The main themes are micro- and nanobiotechniques at interfaces between biomaterials and biosystems and bioreactor-based cultivation systems. The event will offer scientific presentations on trends in biomaterials development and provide opportunities for brief presentations on technology offers/requests and ideas for new research and technological development projects within Europe's Sixth Framework Programme. The registration deadline is September 20. More information can be accessed on-line at www.biomaterial2004.de.

Chinese Academy of Sciences General Assembly Touches on Materials

During the 12th General Assembly of the Chinese Academy of Sciences (CAS), held June 2–6, CAS members addressed long- and midterm plans for national scientific and technological development. In his address to the assembly, Chinese President Hu Jintao called on the scientific community to contribute more to the country's scientific and research undertakings and to strive for accelerated modernization. He said China should increase its support of research projects involving information technology, biology, energy, nanoscale technology, and new materials technology.

Among the scientific presentations, the members heard from Hong Maochun, director of the CAS Fujian Institute of Research on the Structure of Matter, who spoke on self-assembly and molecular nanotechnology. The general assembly also approved proposals to divide the CAS former Division of Technological Sciences into two new ones, the Division of Information Technology and the Division of Engineering and Materials Sciences, and to rename the former Division of Biology as the Division of Life and Medical Sciences. □

ESF Call for Proposals

The European Science Foundation (ESF) announces a call for proposals for the EUROCORES Programme European Mineral Sciences Initiative (EuroMinSci). The EuroMinSci Programme is expected to run for five years. **The deadline is September 30, 2004**. Information is available on the ESF Web site at www.esf.org/eurominsci.

For Science Policy Affecting Materials Research . . .

. . . access the Materials Research Society Web site: **www.mrs.org/pa/**

https://doi.org/10.1557/mrs2004.157 Published online by Cambridge University Press