

DOE Advances Nanotech Center Plans

The Department of Energy took another step toward its goal of creating five state-of-the-art nanotechnology research centers with the announcement in June that Brookhaven National Laboratory in New York, will receive up to \$85 million over the next four or five years to build the Center for Functional Nanomaterials. With the approval to proceed with the Brookhaven facility, DOE has three of its planned nanotechnology centers in the design phase, one at which construction is about to begin, and the fifth in the proposal stage.

"Nanoscience holds the potential for a veritable second industrial revolution," Energy Secretary Spencer Abraham told a gathering at Brookhaven on 14 June. When completed, the center will be located next to the National Synchrotron Light Source and "will design new classes of materials to boost energy efficiency, new solar energy devices, and superconducting materials for vastly improved energy transmission," Abraham said. The preliminary cost estimate for the project, including design and construction, is \$70 to \$85 million.

The Brookhaven center will focus on six areas of research: examining changes in the electronic response of metal oxides with nanoscale dimensions; probing magnetic interactions in nanomaterials; studying new ways to form nanocatalysts; understanding electronic conduction in molecular wires; studying the self-assembly of thin organic films; and developing applications such as nanoscale electronic devices, ultrathin-film optical devices, and advanced fuel cell catalysts.

The Center for Nanophase Materials Science at Oak Ridge National Laboratory in Tennessee is the farthest along of DOE's planned nanotech centers, with \$24 million in construction funds in President Bush's fiscal year 2003 budget request. The center, which could be completed by 2006, will include a nanofabrication research laboratory and a nanomaterials theory institute.

The Center for Integrated Nanotechnologies, a joint effort by Sandia National Laboratories and Los Alamos National Laboratory, both in New Mexico, is in the engineering design phase. When completed, the center will focus on sample preparation capabilities for thin films, elec-

tron transport, patterning, and magnetic layered structures.

The Molecular Foundry Nanotechnology Center, planned for the Lawrence Berkeley National Laboratory in California, is also in the engineering design phase. That facility, as the name implies, would focus on designing, synthesizing, and characterizing nanoscale materials.

The final facility, the Center for Nanoscale Materials at Argonne National Laboratory in Illinois, is still in the proposal and peer-review stage. The center is expected to focus on fabricating nanomaterials and measuring their structural, physical, and chemical properties.

Ray Orbach, head of DOE's Office of Science, said the centers will be "complementary, not duplicative." All of the centers will eventually be open to outside researchers on a peer-reviewed basis, he said.

DOE is seeking \$139 million to fund all of its nanotechnology initiatives in FY 2003. Overall, the administration is asking for about \$710 million to fund the National Nanotechnology Initiative (NNI) in FY 2003. That money would be spread over 10 federal departments and agencies, with the bulk of it funding the DOE centers and another six nanotechnology research and education centers sponsored by NSF.

In June, the National Research Council issued a report reviewing the progress of the NNI since it began in 1996, and said the Nanoscale Science, Engineering and Technology Committee set up as part of NNI, has been important in coordinating the many agencies involved in nanoscale research. The NRC report recommended that an independent nanoscience and nanotechnology advisory board be established to provide advice to the NSET Committee on research investment policy, strategy, program goals, and management processes. The report also called for development of a "crisp, compelling, overarching strategic plan" to guide US development of nanotechnology in the short, medium, and long term.

JIM DAWSON

'Missile Man' Is Indian President

A vul Pakir Jainulabdeen Abdul Kalam, who became a national hero in India for his central role in carrying out India's five nuclear tests in 1998, has been elected president of

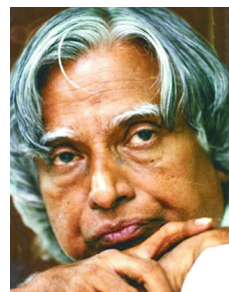
India in a landslide, winning 89% of the electoral college votes. The 71-year-old scientist is a longtime supporter of the ruling Hindu nationalist Bharatiya Janata Party and was backed for the presidency by most of India's major political parties, including the opposition Congress Party. The most vocal opposition to Kalam came from the communist parties, which nominated Lakshmi Sahgal, an 87-year-old feminist, poet, and freedom fighter, to run against him. Despite being mainly ceremonial, the president can break a deadlock in parliament, announce new elections, and decide, after an election, which party should be asked to form a government. Kalam is the first scientist and only the third Muslim to hold the presidency.

Born in the southern state of Tamil Nadu, Kalam received his PhD in aeronautical engineering from the Madras Institute of Technology in 1958. He began working for the Indian Space Research Organization in 1962 as a scientist and eventually led the team that launched India's first space rocket, in 1980. Shortly afterward, he left

to become director of the Defence Research & Development Organisation, which designs and develops weapons technologies for India's armed forces. As director, he developed India's guided missile program between 1982 and 1991, before stepping down to become science adviser to the defense minister. After India's nuclear tests, Kalam became the overall science adviser to the government, with the rank of cabinet minister. Not only a scientist, Kalam is also a best-selling author and amateur musician. Since his retirement from government last year, he has spent most of his time teaching and speaking passionately about integrity and values.

In his 25 July acceptance speech, Kalam mapped out his intention to use his new position to push for increased science education for children and to encourage the use of technology to help eradicate illiteracy, poverty, and unemployment within 20 years. He indicated that a rapid transformation can change the country into a developed nation: "This is the time to ignite the minds of the people," he said.

PAUL GUINNESSY



BHARAT RAKSHAK

KALAM