

manages Scientific User Facilities and the Energy Frontier Research Centers, would increase by 6.7% over last year's numbers. A total of \$325 million is to go to the US Advanced Research Projects Agency-Energy (ARPA-E), which supports high-risk, high-payoff materials research.

To address the administration's Materials Genome Initiative, the FY 2016 proposal requests \$256.95 million for the Cyber-Enabled Materials, Manufacturing, and Smart Systems initiative within NSF. The funding request for the Division of

Materials Research is \$315.80 million, which is an increase of 2.9% over FY 2015. Funding for 21 Materials Research Science and Engineering Centers would hold steady at \$56.0 million.

The MRS GAC has been monitoring the US R&D budget for several years and is particularly concerned about the country's global competitiveness. According to GAC, over the past decade China has increased its R&D expenditures by 90% and South Korea by 50%, while US expenditures have remained relatively level.

GAC correlates this cutback in funding to the "declining rate of discovery, numbers of patents, and workforce preparedness."

The Committee on Science, Space, and Technology in the House of Representatives is also concerned with US competitiveness as the members began debating in April on how basic R&D should be funded. Just as *MRS Bulletin* went to press, the Chair of the committee, Lamar Smith (R-Texas), introduced the America COMPETES Reauthorization Act of 2015 to the committee.

### India urges scientists to use renewable, green material

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**H**arsh Vardhan, Union Minister for Science and Technology in India, has urged scientists and technologists working on developing low-cost building and structural material that they have got to bear most of the burden of implementing Indian Prime Minister Narendra Modi's dream of a roof above every head by 2022.

Addressing the staff of the CSIR-Structural Engineering Research Center (CSIR-SERC), a Laboratory of India's Council for Scientific and Industrial Research (CSIR), in March, Vardhan said, "Construction technologies, high science products and specialized services developed by SERC would form an essential component for the Prime Minister's project."

The Minister visited various laboratories in CSIR-SERC, which included Earthquake Engineering, Structural Health Monitoring, Wind Engineering, Structural Concrete Engineering, and Technology and Advanced Computational Structural Mechanics. He was accompanied by M.O. Garg, Director-General, CSIR, and A.B. Mandal, Director, SERC, as well as a number of industrialists. In reference to the industry representatives, Vardhan said that entrepreneurs should

focus on using renewable and green materials of Indian origin, including materials based on nanotechnology that have a minimum carbon footprint and that are low cost and sustainable.

Over the past 50 years, CSIR-SERC has accumulated experience in research and development (R&D) in the field of structural engineering covering a wide spectrum: materials for concrete, computational mechanics for analysis design of special structures, structural dynamics, earthquake engineering, wind engineering, bridge engineering, disaster mitigation, nondestructive techniques for condition assessment of concrete structures, durability of concrete structures, lightweight structures, composite construction, alternate materials, nano-engineered materials, and repair and rehabilitation of structures.

CSIR-SERC was instrumental, for example, in the areas of service life extension of concrete and steel structures of nuclear power plants, thermal power plants, and road and rail bridges, developing expertise for the systematic condition assessment using nondestructive techniques.

Now the construction industry is under pressure to increase productivity, reduce

cost, and enhance the quality levels of constructed facilities. Construction in earthquake-prone areas demands lightweight, high-strength materials with large ductility or deformability for in-plane and out-of-plane loading. A prefabricated method of construction is the only solution to encounter the growing demand for housing, according to the Ministry for Science and Technology. CSIR-SERC has taken steps for meeting the demands of the housing and infrastructural facilities and to upgrade them for safe upkeep. In this context, five technologies have been developed at CSIR-SERC: prefabricated lightweight large panels using expanded polystyrene, pre-engineered cold-formed steel for multi-storied buildings, pre-engineered FABcrete—an innovative material for sandwich panels, self-compacting ferro-cement mortar for thin panels, and steel-foam concrete composite lightweight panels.

A large number of industrialists connected with infrastructure were present on Vardhan's visit to CSIR-SERC. They included D. Adinarayana Rao (BGR Energy Systems Ltd), S.S. Mani (BHEL, Ranipet), Vivek Chari (TAG Corporation), S. Ravishankar (Adani Infra India), S. Ram Mohan (NLC, Neyveli), and D. Srinivasa Rao (Hindustan Shipyard Ltd). □

