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Newsletter

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Meeting Announcement

REMINDER- the **revised** schedule of meetings for the remainder of the chapter year has been set:

December 10th, 2003-	Holiday Social
January 16th, 2004-	**Joint Meeting with ANS**
March 11th, 2004-	To Be Announced
April 21st, 2004-	To Be Announced
June 1st, 2004-	Annual Meeting

Be sure to set aside January 16th for a joint meeting with the Northeast Chapter of the ANS, which will feature an address by New Hampshire Congressman Charles Bass, at the Crowne Plaza Hotel in Nashua.

MIT, Tsinghua Collaborate on Development of Pebble-Bed Reactor

Nancy Stauffer

[*This article was featured in MIT News on October 22nd, 2003, and is reprinted with permission. You can view the article at* http://web.mit.edu/news.html]

Researchers at MIT and Tsinghua University in Beijing will collaborate on the development of a pebble-bed nuclear reactor, thanks to an international agreement between the U.S. Department of Energy and the China Atomic Energy Authority. The reactor could become a cost-competitive, meltdown-proof alternative to today's commercial nuclear power plants.

For the past six years, MIT and Tsinghua research teams have been working independently on studies of the modular high-temperature pebble-bed reactor. MIT researchers have been performing analytical studies and simulations, while Tsinghua researchers have built and are running experiments in a 10-megawatt (thermal) research reactor, the world's only operating pebble-bed reactor.

Now the teams will be able to work jointly. Their collaboration is the first covered by a new international agreement, adopted in mid-September, that establishes mechanisms for the United States and China to exchange technologies and ideas relating to nuclear power.

"The agreement provides an incredible opportunity for bringing the world together on this promising technology," said Professor Andrew Kadak of the Department of Nuclear Engineering, who leads the MIT research and was instrumental in the three-year effort to get the agreement signed. He is now contacting other pebble-bed researchers in the United States, Europe, South Africa and elsewhere to develop a list of important topics to address. "I'm trying to develop an international effort that will go far beyond the MIT/Tsinghua collaboration since there is worldwide interest in the technology," said Kadak.

While groups in South Africa and the United States have plans to build pebble-bed reactors, Kadak would like to see the Tsinghua reactor become "the world's research reactor for this technology to provide the technology base for future innovations."

Professor of Nuclear Engineering Mujid Kazimi, director of MIT's Center for Advanced Nuclear Energy Systems, stressed the importance of the international agreement, which covers the commercial exchange of technologies as well as collaborative research and defines procedures for the government-to-government exchange of nonproliferation assurances. "The agreement thus furthers international cooperation in the area of proliferation-resistant technology," said Kazimi.

The current MIT research on the pebble-bed reactor dates back to an MIT Independent Activities Period class led by Kadak in 1998. Instructed to find a technology that could address the competitive and political challenges of the nuclear industry, students selected the pebble-bed reactor—a design originally developed in Germany in the 1960s and studied by the late MIT Professor Lawrence Lidsky in the 1980s. The reactor's name reflects its fuel: uranium is encased in billiard-ball-sized graphite pebbles that cannot get hot enough to melt within the small core and are "prepackaged" for long-term disposal without reprocessing.

Kadak, co-principal investigator Ronald Ballinger (associate professor in the departments of nuclear engineering and materials science and engineering) and a student design team began taking a fresh look at all aspects of the technology, including the fundamentals of fuel design, safety and the power conversion system.

Recently, their attention has focused on the modular approach to construction. Block-like structures containing specified components would be manufactured in factories, shipped and assembled at the site—an approach that could cut construction costs in half.

The "plug-and-play" approach to construction and the small size of the reactor could revolutionize how nuclear plants are built. "If this works, the economic obstacle to building new plants will be removed," said Kadak. If competitive, such small, modular plants will be attractive not only to the U.S. market but also to China and other rapidly developing countries that have widely dispersed populations.

Initial exchanges between MIT and Tsinghua were supported by the MIT Laboratory for Energy and the Environment and MIT International Science and Technology Initiatives. Research funding was subsequently provided by the Idaho National Engineering and Environmental Laboratory and the Department of Energy. Current funding comes from the Nuclear Regulatory Commission.

Congress Mostly Backs Bush on Nuclear Weapons, Waste

Contributed by Rusty Lorenzen

WASHINGTON, Nov. 5 (Reuters) - U.S. House of Representatives and Senate negotiators on Wednesday agreed to give President George W. Bush money to study new types of nuclear weapons, as critics warned the move could spark a new nuclear arms race.

The funds were approved as part of a $27.3 billion bill for energy and water programs next year which also includes spending for a controversial nuclear waste dump in the Nevada desert that opponents have vowed to block.

Both chambers are expected to clear the spending bill soon and sent to Bush to sign into law.

The bill would give Bush half of the $15 million he had sought to develop an earth-penetrating nuclear warhead for use against deeply buried bunkers and all of the $6 million he wanted to research small, low-yield nuclear weapons.

Critics argued that small nuclear weapons are dangerous because policy-makers may see them as a usable adjunct to conventional arms, heightening risks of nuclear escalation.

"This is just a horrible message to send to the rest of the world," said North Dakota Democratic Sen. Byron Dorgan.

The House initially cut almost all of the funds for the programs. But most were restored at the Senate's insistence.

"We have compromised rather substantially," said New Mexico Republican Sen. Pete Domenici.

Congress is scrambling to finish its overdue budget work before it adjourns for the year, and the House was due later on Wednesday to clear the latest in series of stopgap measures to keep the federal government open until Nov. 21.

The spending bill would also provide $580 million for the controversial Yucca Mountain nuclear waste disposal project in 2004, around $11 million less than Bush had requested but far above a $425 million limit earlier endorsed by the Senate.

The plan aims to site the first permanent U.S. nuclear waste repository in the desert northwest of Las Vegas and is bitterly opposed by the state of Nevada, whose senators have generally succeeded in capping its funding in past years.

While Congress has given final approval for the project, scheduled to open in 2010 and hold up to 77,000 tons of radioactive waste, the state has launched multiple lawsuits seeking to block it on safety grounds.

The spending bill would commit around $11 million next year to a proposed new factory to make the plutonium "pits" at the heart of U.S. nuclear weapons. The last U.S. facility manufacturing the nuclear triggers closed in 1989.

It also contains nearly $25 million to fund an effort to cut the time it would take to again begin testing U.S. nuclear weapons from three years to two years. The United States has observed a nuclear test moratorium since 1992.

Vendor Night and Holiday Social

Date: Wednesday, December 10th, 2003

Location: Albert's Restaurant, 217 Washington St (Rt. 138), Stoughton, MA 02072

Time: 3:30-6:00 PM Registration / Cash Bar / Vendor Displays
6:00 PM Dinner Buffet

Bring your business cards! Visit each vendor, leave a business card, and be eligible to win prizes. The vendor raffles will follow dinner.

Cost: $20.00 Members, $25.00 Guests, and $15.00 Students

To Register: *Mail registration to:*

Chris Martel
306 Hayden Rowe
Hopkinton, MA 01748

or e-mail to register: **ccjjmartel@comcast.net**
or register online at: **www.nechps.org**

Please note, you can make payment up to and including the night of the event (pay "at the door"); however, no matter when you make payment, please register beforehand.

Directions:

From 128 N or S:

Take exit 2A, 138 S, Stoughton. Remain on 138 S for about 4 miles. Albert's is on the right (the address is 217 Washington Street).

From 24 N or S:

Take exit 19 B, Central Street. Follow Central Street to the intersection of Central and Route 138 (Washington Street). At the intersection, take a right. Albert's is a short distance past the intersection on your left.

For additional information please call Albert's at: (781) 344-1800.