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HOTLINE

The Princeton Plasma Physics Laboratory is a United States Department of Energy Facility

PPPL Applauds ITER Site Selection

PPPL applauded the news of June 28: a site for ITER had been selected and the project would proceed. In Moscow, the ministers representing the six ITER parties announced the international fusion reactor would be located at the European Union site in Cadarache, France.

"I am very glad to be able to report to you that an agreement has been reached on the siting of ITER. The form of the agreement is a win-win for Europe and Japan, and a win for the rest of us, since ITER is going forward! As you know, PPPL, partnering with ORNL [Oak Ridge National Laboratory], has been selected to host the U.S. ITER Project Office — so now we are embarked on a very important new mission in the service of the nation and all nations, as it says in Princeton's motto," said PPPL Director Rob Goldston in a memo to staff.

Raymond L. Orbach, Director of the U.S. Department of Energy's Office of Science, represented the United States at the ministerial meeting in Moscow.

"The United States supports the decision of the parties to the ITER negotiations to conduct the international fusion reaction experiment at Cadarache, France, and the U.S. looks forward to getting ITER construction there underway as soon as practical," said Orbach. "It boded well for ITER that there were two serviceable sites and six parties committed to this important fusion project. Now that the partners have agreed on a site, the ITER negotiations must also resolve an agreed-upon financial and procurement arrangement, together with a satisfactory management and oversight arrangement." The six parties are the U.S., the European Union, Russia, China, South Korea, and Japan. Japan also had offered a site for ITER.

Orbach said that in these negotiations, the U.S. will continue to strive for a robust management structure and an oversight program based on the principles of equity, accountability, and transparency to ensure both the success of the project and the best use of taxpayer dollars. "Fulfilling the promise of ITER will require continued international collaboration and cooperation such as that demonstrated by the six parties to the ITER talks in arriving at today's decision."

PPPL Director Rob Goldston (left) and U.S. ITER Project Office Manager Ned Sauthoff stand in front of the ITER poster in the Lobby.

In July 2004, PPPL was selected to host the U.S. ITER Project Office in partnership with ORNL. The Office will be responsible for project management of U.S. activities to support construction of the ITER research facility. This 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. with 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. Components for which the U.S. is responsible will be built mostly under subcontracts with American industry.

Ned Sauthoff, Manager of the U.S. ITER Project Office, said PPPL would have strong roles in project management and administration of the U.S. contributions to the ITER project, with overall responsibility for procurement of all the U.S. contributions. "We are forming an integrated

Continued on page 6

PPPL Honors Inventors at Patent Dinner

The inventors honored at the Patent Dinner are, from left, (front row) Ernest Valeo, Richard Majeski, David Cylinder, and Hironori Takahashi; (back row) Lewis Meixler, Nathaniel Fisch, Richard Hawryluk, Charles Skinner, Ilya Dodin, and Masayuki Ono.

On June 16th, the Laboratory honored its inventors at the twenty-third annual Patent Awareness Program Recognition Dinner at Princeton University's Prospect House. The 18 honorees, who disclosed inventions during Fiscal Year 2004, were from the Research, Engineering, and Technical staff of PPPL, as well as from other institutions that work in collaboration with the Laboratory.

One Patent Issued

This year, a patent was issued for an invention by PPPL physicist Hironori Takahashi and new patent applications were submitted for two other PPPL inventions.

Takahashi's invention is the "Magnetic-Field Sensing Coil Embedded in Ceramic for Measuring Ambient Magnetic Field." A magnetic sensing coil, sometimes called a Mirnov coil after a Russian investigator who used it during the dawn of tokamak research, is a length of wire wound in a spiral. It has changed little since scientist Michael Faraday used it for the first time more than 150 years ago.

"Takahashi transformed it into a modern package suitable for 21st century applications by embedding the spiral in ceramic. It can withstand the rigorous environment encountered in fusion reactors, which includes the simultaneous presence of ultra-high vacuum, ultra-high temperatures, and radiation. When ITER is ready, Hiro will be ready with his magnetic coils," said PPPL Deputy Director Rich Hawryluk. Hawryluk commented on the significance of each of the inventions and presented certificates to the honorees, and a plaque to Takahashi. The plaque will be placed in the LSB Lobby.

Continued on page 3

Hotline

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Patent

Continued on page 3

Lewis Meixler, Chairperson of the Laboratory's Committee on Inventions, also offered remarks at the dinner. "We are here to celebrate and give recognition to this year's inventors and I would encourage the submission of new inventions before the end of this fiscal year on September 30, so that those inventors can be recognized at next year's ceremony," said Meixler.

Inventors Honored for 2004

The inventors honored for 2004 are Richard L. Berger, Wonho Choe, David A. Cylinder, Ilya Y. Dodin, Alexander Dunaevsky, Nathaniel J. Fisch, Charles Gentile, Richard Hawryluk, Jayhyun Kim, Steve Langish, Richard Majeski, V.M. Malkin, Lewis Meixler, Masayuki Ono, Robert Parsells, Charles Skinner, A.A. Solodov, Hironori Takahashi, and Ernest Valeo. ●

Patents Issued in Fiscal Year 2004

Magnetic-Field Sensing Coil Embedded in Ceramic for Measuring Ambient Magnetic Field 6,690,165 B1
Hironori Takahashi

Patents Applied for in Fiscal Year 2004

Electrostatic Dust Detector
Charles Skinner

Thermoelectrically Cooled Energy Transmission Window
Robert Parsells and Charles Gentile

Inventions Disclosed in Fiscal Year 2004

Tandem Clapper Air Vehicle
David A. Cylinder

Electrostatic Dust Eliminator
Charles Skinner

Lithium "Thick Film" First Wall
Richard Majeski

The Committee on Inventions

C.Z. Cheng, David Cylinder, Philip Efthimion, Terry Greenberg, Richard Hawryluk, Stephen Jardin, Henry Kugel, Lexis Meixler (Chair), Carol Phillips, John Schmidt, Hironori Takahashi, Michael Williams, and Ed Winkler

Pump Side-scattering in Ultra-powerful Backward Raman Amplifiers
A.A. Solodov, V.M. Malkin, and Nathaniel J. Fisch

Asymmetric Ponderomotive Current Drive with Reduced Cyclotron Heating
Nathaniel J. Fisch and Ilya Y. Dodin

Multi-step Backward Raman Amplifiers (BRA)
V.M. Malkin and Nathaniel J. Fisch

Homogeneous Plasma Source
Ernest Valeo and Nathaniel J. Fisch

Laser-ionization-produced Plasma Source
Richard L. Berger, Ernest Valeo, and Nathaniel J. Fisch

Airflow Control by Ferroelectric Plasma Sources
Alexander Dunaevsky and Nathaniel J. Fisch

RF Microdischarge Thruster
Alexander Dunaevsky and Nathaniel J. Fisch

Center-post Plasma Start-up Concept
Masayuki Ono, Wonho Choe, Jayhyun Kim, and Richard Hawryluk

Miniature Integrated Nuclear Detection System with Improved Detection Capability
Charles Gentile, Steve Langish, and Lew Meixler

Plasma Sterilization Process for Plastic Containers with Integral Pulse Modulation Unit
Lewis Meixler

Krommes Honored for Mentoring Grad Students

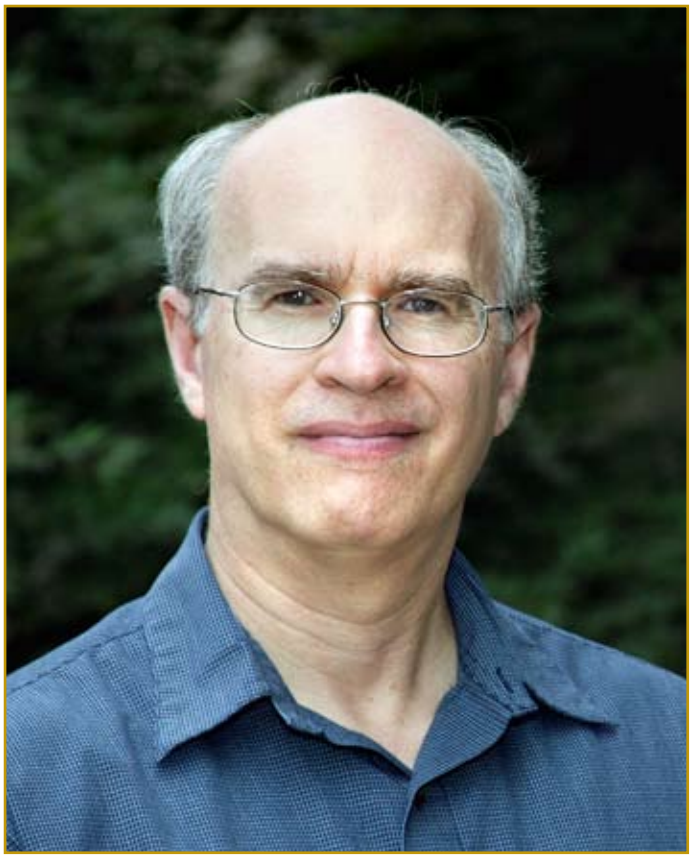
PPPL's John Krommes was among four Princeton faculty members named as recipients of Graduate Mentoring Awards by the McGraw Center for Teaching and Learning. They were honored during the Graduate School's hooding ceremony on May 30.

The McGraw Center, together with the Graduate School, instituted the award in 2002 to recognize Princeton faculty members whose work with graduate students is particularly outstanding. It is intended to honor faculty members who nurture the intellectual, professional and personal growth of their graduate students.

Graduate students nominate faculty members for the award and, along with faculty members, serve on the committee that selects the winners. One faculty member in each academic division (humanities, social sciences, natural sciences and engineering) is chosen. In addition to being honored at the ceremony, each receives a $1,000 award and a commemorative gift.

In addition to teaching in the Department of Astrophysical Sciences' Program in Plasma Physics, Krommes is a principal research physicist and Distinguished Research Fellow at PPPL. He earned a Ph.D. from Princeton in 1975 and joined the research staff in 1977, becoming a lecturer in 1978.

"He has high expectations for students, both class members and research advisees, and he is willing to generously offer his time to ensure their understanding and success," wrote one graduate student in his nomination. "He is committed to using his role as an adviser to benefit our development as researchers and enrich our future careers. He is a patient teacher who listens before speaking and takes time to understand his students and therefore teach us better."



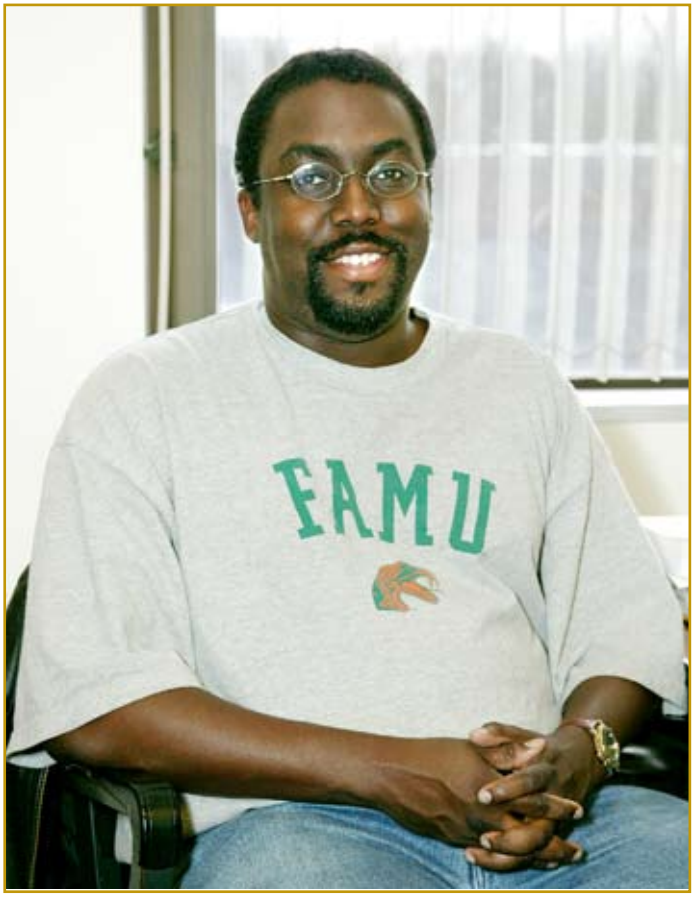
John Krommes

The other recipients are Sanjeev Arora, professor of computer science; Edward Eigen, lecturer in architecture; and Noreen Goldman, professor of demography and public affairs. — *From the May 30 Princeton Weekly Bulletin* ●

Summer Students Experience the Fun of Physics

On July 7, several PPPL summer students spent the day at Six Flags Great Adventure to pick up a little physics off site. Students in the National Undergraduate Fellowship, Science Undergraduate Laboratory Internship, and Pre-service Teacher programs explored the physics of roller coasters as part of an enhancement activity. From left, Karl McMurtry of Occidental College, Colin Parker of Harvey Mudd College, John Smith of the Colorado School of Mines, and Laura Lizarzaburu of El Camino College form three "P"s and an "L" on their hair-raising roller-coaster ride. The photo was taken by a camera mounted near the bottom of a secondary drop that automatically shoots pictures as the train passes. The students are at PPPL for 10 weeks working with mentors on scientific projects through programs coordinated by Science Ed Program administrator James Morgan. ●

Spotlight



Name: Kyron Williams

Position: Postdoctoral Research Fellow through Oak Ridge National Laboratory, with a two-year appointment in PPPL's Experimental Physics Division working with physicist Stewart Zweben on the Gas Puff Imaging System.

Through this system, high speed two-dimensional images of edge turbulence in the National Spherical Torus Experiment (NSTX) are made using an ultra-fast camera. Gas puffs are introduced to increase the brightness and contrast in the fluctuation images in order to help track the fast moving turbulent structure at the edge of the plasma.

Williams is involved in data analysis from the Gas Puff Imaging System and in maintaining the system.

Quote: "I received a Ph.D. in physics in 2004 from Florida A&M University. I had worked at PPPL on CDX-U research with Bob Kaita for a couple of summers while I was a student. I was always interested in fusion, and couldn't pass up an opportunity to work on a real project. After graduation, I completed some work in a lab with my university advisor for several months and applied at PPPL. I had two other offers for post doc positions, but I was really excited about coming here. PPPL is a place I wanted to come back to.

I've always been interested in science. Never has anything held my attention the way science does. In college, I started out as an electrical engineering student, and then found I was more interested in physics — a field that seemed to have more questions to explore."

Williams usually arrives at PPPL each morning at 8, heading down to the NSTX Control Room to acquire data. When NSTX is operating, he attends the 8:30 a.m. run meetings in the Control Room. He also attends many physics meetings. When the machine is not operating, Williams analyzes data acquired from the Gas Puff Imaging System, and helps with the system's maintenance and upgrades.

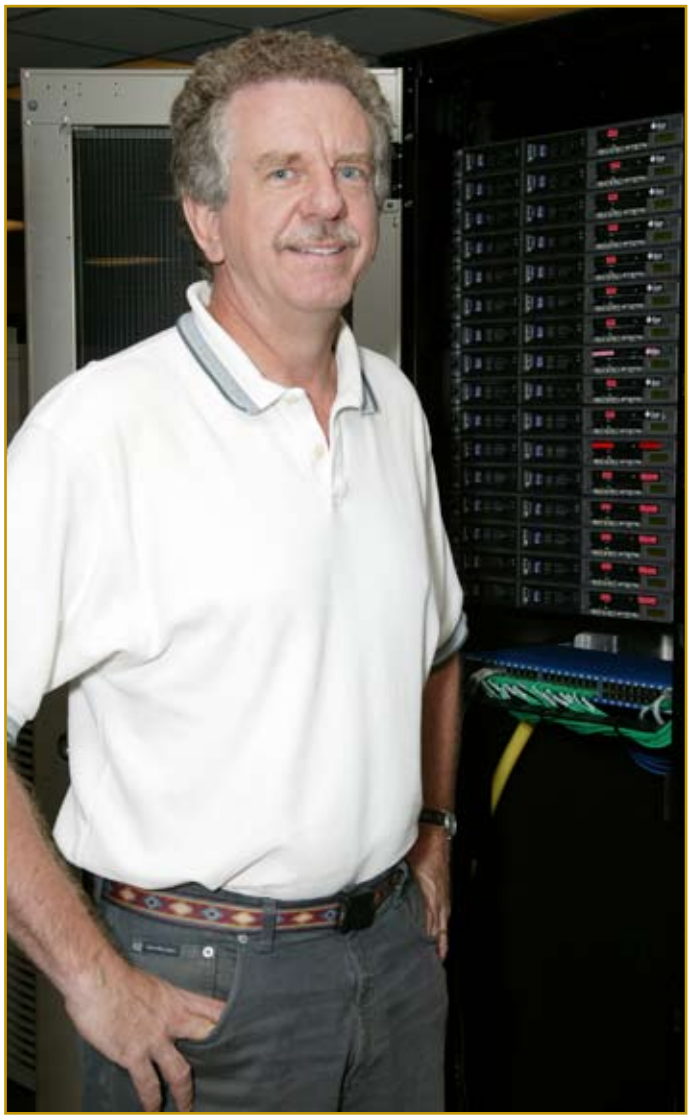
"PPPL is a challenging place to work, and I like a good challenge. At the Laboratory, I'm broadening my knowledge of plasma physics. I wanted to come here because there is such a specialized focus at PPPL. At Florida A&M, I received more of a general training in physics, although there are three or four faculty members there who concentrate on plasma research."

Williams said he likes the sense of community here and the team approach. "At Florida A&M, you work independently for the most part, but at PPPL you don't do anything without input from others. The group experience provides a better understanding of the details of how a large experiment works," he said.

Other interests: Williams is a music buff and bicycling enthusiast. "I have a huge collection of jazz and R&B music that I hauled up here with me [from Florida]," he noted. The collection includes hundreds of CDs and many records. His favorite artist is Stevie Wonder, and he also enjoys the jazz band Incognito, as well as listening to jazz legends John Coltrane and Miles Davis.

As for bicycling, Williams had a 10 speed in Florida that he rode regularly. He plans on getting a bicycle in New Jersey and starting up again. "I like to get on the road and pedal away." ●

New Sun Servers Added



PPPL recently received an Academic Excellence Grant from Sun Microsystems for 10 of the latest SunFire V20z servers that are currently being used by the general PPPL computing community. The grant is worth about $50,000. The servers are now housed in the PPLCC computer room, and now SUN has a customer that "simulates the Sun on SUN."

PPPL Senior Computer Systems Administrator Jim Hirsch (above with the new servers), who submitted the application to SUN, said, "We've been using Sun Microsystems computers here for many years, so we were very grateful and excited to receive this grant from Sun for their newest, fastest high-performance computing systems. The systems were brought on line in early 2005, and have made a significant improvement in both our Unix interactive and Beowulf cluster environments." ●

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Continued from page 1

project management team with both PPPL staff and ORNL project management experts experienced from construction of the $1.4B Spallation Neutron Source (SNS) [at ORNL] and will be competitively selecting the Project Engineering Manager, the Chief Scientist, and the Chief Technologist. In addition, we will be competitively selecting the leaders, R&D performers, designers, and engineering oversight performers for all the U.S. in-kind contributions," said Sauthoff. ORNL's Carl Strawbridge is expected to move to PPPL as the Planning and Control Manager for the U.S. ITER Project Office in 2006 after SNS is built. Plans are being formed to locate Project Office staff on the third floor of PPPL's Lyman Spitzer Building.

Sauthoff added that the U.S. office would also be competitively selecting individuals to serve on the international ITER team in Cadarache and in the international team's field teams for all six ITER parties. "As such, PPPL's roles in the technical areas will depend on the results of the competitions. PPPL individuals and the institution are invited to express interest using the web-based form being prepared by PPPL's Skip Schoen and to be released soon," he said.

Asked how staffing at the Laboratory will be affected, Sauthoff responded that the U.S. ITER activities fit into the project and the program. "In the project, we have the R&D, design, industrial fabrication, and oversight of the U.S. in-kind contributions, as well as project management and providing the U.S. members of the international ITER team," he said. "In the Program are the supporting activities funded by the domestic program, including existing facilities, experimentation, diagnostics, heating and current drive systems, theory, modeling, and engineering. As such, a significant fraction of the PPPL program will support ITER."

The Project Office Manager said that recently the DOE appointed Professor Raymond Fonck, a former PPPL researcher, to lead the U.S. Burning Plasma Organization. This organization will coordinate U.S. activities that interrelate the ITER needs and opportunities and the domestic research program, as well as position the U.S. for research on ITER. "In my vision, the best way for PPPL researchers and engineers to position for ITER research participation is by performing leading work in areas related to ITER research, as well as by working on the ITER project team itself," Sauthoff said.

At the Department of Energy, the mood was jubilant over the site selection announcement, a critical step for ITER — and fusion research — to move forward. U.S. Secretary of Energy Samuel W. Bodman said, "Plentiful, reliable energy is critical to continued worldwide economic development. Fusion technologies have the potential to transform how energy is produced and provide significant amounts of safe, environmentally friendly power in the future. The ITER project will make this vision a reality." ●

ESU Displays Emergency Equipment

In May, PPPL's Emergency Services Unit displayed emergency equipment in the LSB Lobby and provided information to staff about topics such as injury prevention, recognizing an emergency, and what to do until help arrives. The display and information session celebrated National Emergency Medical Services (EMS) Week, which was themed this year, "EMS: Ready, Responsive, Reliable."

"We use EMS Week to educate our employees about injuries and injury prevention at work and at home. This year we stressed recognition of traumatic brain injuries (TBI). TBI, or concussion-closed head injury, commonly occurs as a result of a fall or a motor vehicle crash, and affects 1.4 million people per year, with about 85,000 having a long-term disability," said ESU Captain Dave Neuman.

Some ways to prevent TBIs include wearing a seatbelt in the car and a helmet when bicycling or engaging in extreme or contact sports, and using properly sized step stools and ladders. "We want people to be safe not only at PPPL, but also at home. Injuries, especially those resulting in long-term disabilities, affect individuals personally and have an impact on the Lab," said Neuman. ●

PPPL Director Rob Goldston (middle) gets his blood pressure taken by ESU Captain Dave Neuman (left) and ESU Driver-Operator Howard Caruso in the LSB Lobby as part of PPPL's National Emergency Medical Services observance. Representatives from the Lab's Occupational Medicine Office were also on hand.

Mastromarino Joins Human Resources Staff

Kim Mastromarino joined PPPL's Human Resources staff June 16 as the new Benefits Specialist. She replaces Bobbie Forcier, who retired.

As the Benefits Specialist, Mastromarino is responsible for the administration and communication of PPPL's benefits program. She received a bachelor's degree in communications from St. Thomas Aquinas College in Sparkill, New York, in 1997. She worked as a benefits assistant for Polo Ralph Lauren and as a benefits generalist for New Jersey Manufacturers Insurance Company prior to joining the Laboratory. Mastromarino can be reached by phone on extension 2101 or by e-mail at kmastrom@pppl.gov. Welcome, Kim! ●

A Note from the Benefits Office ...

Did you know you can save money on your prescriptions by taking advantage of the Home Delivery Incentive Program though Medco? Or that you can order prescriptions on line?

At http://www.merck-medco.com/ you can:

- reorder your prescriptions
- check your order status
- print forms
- price medication
- print out a temporary ID card

See Kim in the HR Benefits Office for more details. ●

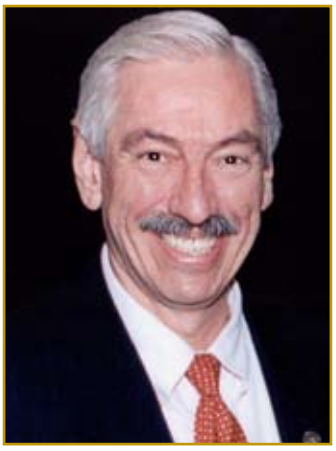
Meade Wins Award from Fusion Power Associates

PPPL's Dale Meade (at right) has been named a recipient of the Fusion Power Associates (FPA) 2005 Distinguished Career Award. The FPA announced the honorees this month. Also receiving the award this year is Charles C. Baker of the University of California, San Diego.

The awards have been given since 1987 to individuals who have made distinguished, lifelong career contributions to fusion development.

In selecting Meade, the FPA Board recognizes his decades of "outstanding contributions to the fusion effort, including but not limited to his roles in leading the Tokamak Fusion Test Reactor (TFTR) and Next Step Options programs and his inspirational guidance in the search for an affordable path to fusion power."

Meade, who recently announced his retirement from PPPL, is Program Head of the PPPL Off-Site Research Department and leads the Next Step Options Activity. He came to PPPL first in 1966 for one year and returned in 1972 after serving as a professor of physics at the University of



Wisconsin. From 1986 to 1991, he was Head of the Tokamak Fusion Test Reactor project and of Experimental Physics in the Research Department, and prior to that headed the Poloidal Divertor Experiment. He was Deputy Director of the Laboratory from 1991 to 1997 and led the U.S. Next Step Option activity from 1998 to 2005 that culminated with the design of the Fusion Ignition Research Experiment, or FIRE. The awards will be presented at the Fusion Power Associates annual meeting and symposium October 11-12 in Washington, D.C. Names of previous recipients are posted at http://fusionpower.org/.

Congratulations, Dale! ●

PPPL Hosts Symposium Honoring Physicist Kritz

The attendees of the "Symposium on the Future of Integrated Modeling" take a break. Arnold Kritz, who was honored at the symposium, is in the center of the front row, wearing a red tie and light gray suit.

On July 19 and 20, PPPL and Lehigh University co-hosted the "Symposium on the Future of Integrated Modeling" at the Laboratory. The symposium celebrated the 70th birthday of Arnold Kritz, a professor of physics and former Chair of the Physics Department at Lehigh University. Kritz was a long-time visitor at PPPL between 1969 and 1991, a former Chair of the Physics Department at Hunter College in New York, and served for four years at the DOE's Office of Fusion Energy Sciences.

The two-day event, organized by Glenn Bateman of Lehigh University, was strategically located in Princeton, where Kritz's colleagues from Hunter, Lehigh, DOE, and PPPL could attend easily. The symposium also attracted international and national participation. ●