Princeton Plasma Physics Laboratory

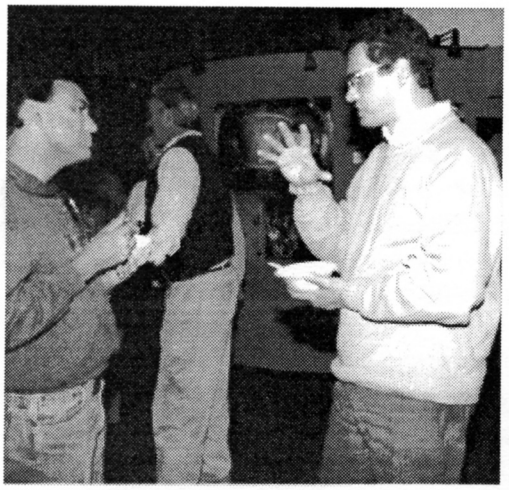
Vol. 19, No. 2 • November 5, 1997

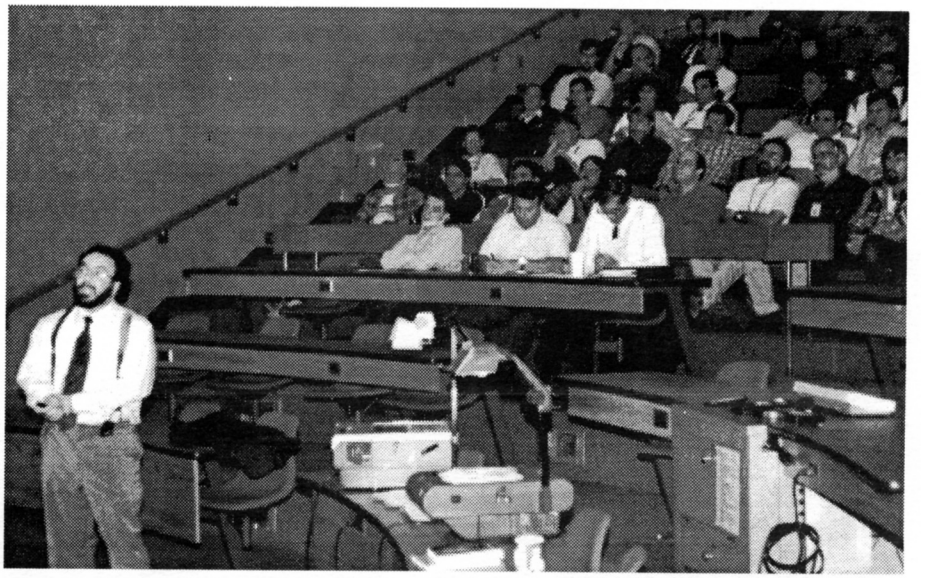
Hotline

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

The Laboratory Sails Ahead

PPPL Director Rob Goldston Rallies the Troops; Ice-Cream Social Follows Talk





PPPL Director Rob Goldston discussed the Lab's plans and future projects and goals to a full house in the MBG Audirorium during a "State of the Laboratory Address" on October 27. Above, Goldston compares the Lab's present state to sailing. "We've successfully tacked the boat. We are trimming the sails. It looks like clear water ahead," he said. The 90-minute talk was followed by an ice-cream bash in the Lobby. Anyone not present who would like to see the address may borrow the videotape by calling Sue Hill at ext. 2227. At top left, Hutch Neilson (right) chats with Dr. Rajesh Maingi, an NSTX collaborator from Oak Ridge National Laboratory.

Employees gather at the "Toppings" table. From left are Joanne Bianco, Arlene White, and Charlie Gentile.

The party is a hit! Staff members enjoy ice-cream sundaes.

Staff Prepares Space for NSTX

By Patti Wieser

The room is ready. In anticipation of the next occupant, PPPL crews decontaminated and removed nearly 1,000 objects, relocated 30-ton slabs of concrete, and slapped a fresh coat of paint on the walls and floor of the former Tokamak Fusion Test Reactor (TFTR) Hot Cell. By October — following four months of effort — the space was transformed into the National Spherical Torus Experiment (NSTX) Test Cell.

On October 15, the clean-up and painting team was rewarded with a pizza lunch in the newly finished room that will house the NSTX.

Dozens of staffers participated in the clean-up project, which also included the removal of large mezzanines, as well as many TFTR diagnostics, and the decontamination of tritium-contaminated components.

The sparkling room now displays a full-scale paper model of NSTX on one wall, a draping of an American flag and the NSTX logo across the shielding material, and a TFTR neutral beam injector that someday may be used for the new project. The construction and eventual operation of the NSTX device at Princeton is a national effort involving PPPL, the Oak Ridge National Laboratory, the University of Washington, and Columbia University. The new experiment will test an advanced plasma configuration which could lead eventually to a relatively inexpensive, compact magnetic fusion device capable of producing high levels of power. NSTX is scheduled to begin operation in mid-1999.

Mike Viola (standing at left) presents a memento to Carl Tilson.

The painting team pauses beneath the NSTX logo and American flag following the lunch. From left (front row) are Sly Vinson, Joe Bartzak, and Will Derry; (back row) Buddy Kearns, Kris Gilton, Jack Hynes, George Prosser, Fred Simmonds, Jr., and Bob Delany.

Clean-up Task Leader Mike Viola told the crew at the party, "The reason we are all here today is to thank you for clearing out the Hot Cell and getting it ready for NSTX. This is a tribute to your efforts."

Viola then distributed "gifts" to some of the team members, including a used conduit, pipes, a telephone receiver, door seals, new hats, and a used pair of cloth shoe covers.

In closing, PPPL Engineering and Technical Infrastructure Head Michael Williams presented NSTX Project Director Masayuki Ono with a large key to the Test Cell.

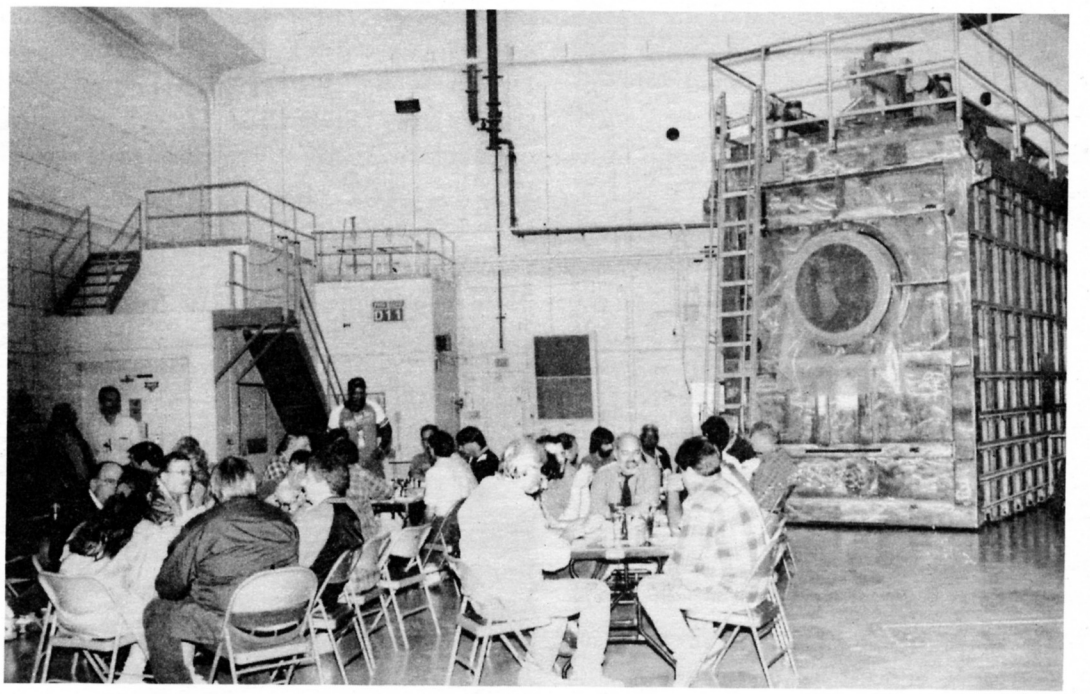
Ono said, "On behalf of the NSTX team, I would like to express our appreciation and admiration for the work the TFTR safe shutdown team has done to prepare this spacious, pristine Test Cell for NSTX." He recalled how not long ago the cell was full of equipment, including the

decontamination facility, the neutral beam injector ion source room, and various diagnostics. "In just a few months, the TFTR safe shutdown team has taken down and relocated those facilities and made the NSTX Test Cell completely free of equipment and tritium. Now, I must ask you to wear a different hat to embark on the challenging NSTX construction task. I am hopeful that NSTX will set many world records and make history for the Laboratory and for the fusion program as its predecessor did. I thank the team for this great accomplishment and look forward to working with you for the successful NSTX construction."

PPPL Deputy Director Rich Hawryluk, mingling with the team during the lunch, thanked everyone. "I never had any doubts this would get done. It is a great space." ●

From left are Al vonHalle, Bob Tucker and Will Derry. Derry is holding the phone receiver given to him as a memento of the clean-up effort.

Engineering and Technical Infrastructure Head Michael Williams presents a key to NSTX Project Director Masayuki Ono.



Staff members involved in the clean-up and painting efforts enjoy pizza in the newly prepared space.

PPPL's Interactive Website Wins Awards

It's "Cool." It's a "Hot Spot." It's a "Best of the Web." It's PPPL's interactive, educational website, called IPPEX, that allows users to operate their own fusion experiments and analyze data from real experiments conducted by physicists. The site recently won five awards.

The Internet Plasma Physics Educational eXperience (IPPEX) website was cited for its excellence earlier this fall on five websites, including those of *New Scientist* magazine and the Exploratorium museum. IPPEX is a fully interactive educational experience that teaches users about plasma physics and fusion energy at a pre-college level (see website address at end).

One of Ten Cool Sites

IPPEX was selected for the Hot Spots section of *New Scientist* Planet Science website. Hot Spots is Planet Science's pick of science and technology-related sites on the web. In addition, the Exploratorium, a museum of science, art, and human perception in San Francisco, chose IPPEX as one of the "Ten Cool Sites" for the month of September, 1997. Each month, the Exploratorium picks the best websites in science, art, and education. Sites are submitted by visitors to the Exploratorium homepages or suggested by its staff and are selected based upon content, design, and the overall experience of visiting them.

The "Virtual Tokamak," an IPPEX section created by PPPL's Daren Stotler, was chosen as one of the top 25 percent web applets by JARS, the JAVA Review Service. JAVA is a programming language invented by Sun Microsystems for writing programs that can be downloaded through the Internet and immediately run on a local computer. Applets are small JAVA programs that allow web pages to include functions such as animations, calculators, or almost anything a regular computer program could do safely.

WWW Associates, an Internet development company whose customers include Hewlett-Packard and Lucent Technologies, voted IPPEX one of the top 10 science sites on the web. Finally, the Yahooligans Directory on the Internet cited IPPEX as its only "cool" physics site under Top Science and Oddities: Physics.

"We are excited we were able to develop a way for students to interact with real scientists, doing real experiments in a way that is meaningful and helpful to the students," said IPPEX Project Manager Andrew Post-Zwicker. "Our goal is to interest them in science and deepen their understanding of basic concepts."

Besides being noted at various websites, IPPEX has had an impact on students from as nearby as the Bronx to as faraway as Italy. IPPEX was featured in the Thirteen/WNET program, "The Internet in Action — Real Time and Remote Visits," where 10th graders at the Bronx High School of Science used it in their physics classes.

And, IPPEX helped create a new plasma physicist when an Italian undergraduate who had finished the TFTR data analysis section wrote expressing a desire to pursue graduate studies in fusion energy, but did not have any contacts in the field. Post-Zwicker introduced him to an Italian colleague who arranged an interview for him. He starts his graduate work this fall.

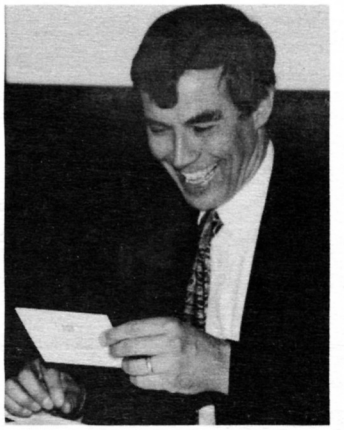
In addition to Post-Zwicker, the IPPEX development team at PPPL includes members of the Science Education Program, physicists Steve Scott and Daren Stotler, Engineering and Technical Infrastructure Head Mike Williams, Computer Division Head Dori Barnes, and software engineer Bill Davis. The new look was created by Da Jin Wang, a 1997 high school summer research student from Union City, NJ. The site includes a section of data analysis from the Tokamak Fusion Test Reactor (TFTR) at PPPL; the "Virtual Tokamak" and Magnetic Drift JAVA applets; interactive units on relevant physics topics; and "Ask a Scientist," in which students from all over the world ask questions on plasma physics and fusion energy.

Teaching Tool

IPPEX gives teachers a tool to use while teaching a subject that is difficult to demonstrate and explain, allowing students to interact with the site, visualize difficult concepts, and analyze actual data from a fusion experiment. It is funded by the New Jersey Networking Infrastructure in Education at the Stevens Institute of Technology through a grant from the National Science Foundation. **The internet address for IPPEX is:** http://ippex.pppl.gov/ippex/ .●

A Farewell to Assistant Director Rush Holt

In September, PPPL'ers said goodbye to PPPL Assistant Director Rush Holt during a luncheon at Goodtime Charley's in Kingston. Holt, who came to the Lab in 1989, left at the end of Fiscal Year 1997.



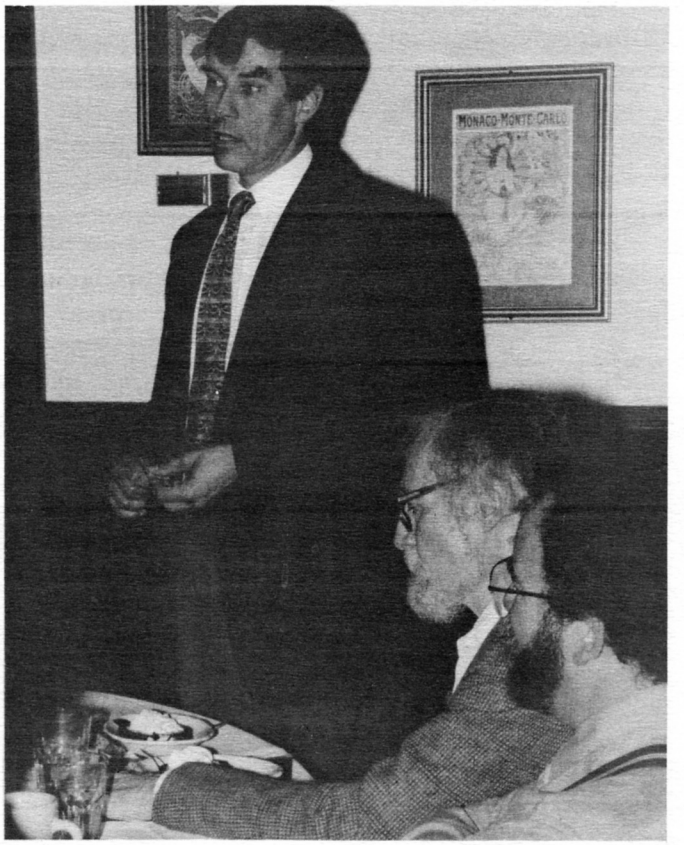
Rush reads a farewell message.

In a farewell message to staff, Rush said, "After returning to PPPL from my leave of absence to run for political office last year, I thought about some things that I wanted to pursue and decided to leave my position at the Laboratory. I plan to spend time writing and working on some social and political issues. Knowing as you do of my work to create and oversee the Science Education Program at PPPL, you will not be surprised to hear that I will remain involved in education, too."

During the luncheon dozens of PPPL'ers wished Holt well, including PPPL Director Rob Goldston and former PPPL Deputy Director Dale Meade, who offered special remarks. While Meade presented Rush with a TFTR watch — one of two in the world — other goodbye gifts included a White House towel, a Newt Gingrich magnet, and an "Actually I *am* a rocket scientist" T-shirt from the Science Education Program staff, an excuse book, an L.L. Bean gift certificate, and a Madison Medal paperweight.

Good luck, Rush! ●

Former Deputy Director Dale Meade (standing at left), who is now Head of Advanced Reactor Concepts at the Laboratory, recaps Rush's career at PPPL.



Rush offers advice and a few jokes during his parting words to Laboratory staff at the luncheon. To his right are former PPPL Director Harold Furth and present PPPL Director Rob Goldston.

PPPL'er Pamela Lucas (left) and former PPPL Director Harold Furth (right) watch as Rush examines the paperweight gift.

Congress Approves Fusion Funding

Net Increase of $5 Million for Fusion Research over the FY 1997 Budget

By Anthony DeMeo

On September 24, the House-Senate Conference Committee on Energy and Water Appropriations agreed to legislation that will provide $232 million dollars for the U.S. fusion energy sciences program in fiscal year (FY) 1998, which began October 1, 1997. This is a net increase of $5 million for fusion research over the FY 1997 budget. The Energy and Water Appropriations legislation includes funding for magnetic fusion energy research at the PPPL, provided by the U.S. Department of Energy.

Good News for U.S. Fusion Energy Program

"This is very good news for the U.S. fusion energy sciences program and for our Laboratory," commented PPPL Director Robert J. Goldston. "We are grateful for the leadership of Senator Frank Lautenberg and Congressman Rodney P. Frelinghuysen, who have put in the effort to understand our program and explain it to their colleagues. We have received strong support from the entire New Jersey Congressional Delegation, especially Senator Bob Torricelli and Congressman Mike Pappas. The Delegation's activities have increased the overall support for fusion research and PPPL."

The Lab's share of the $232 million fusion energy sciences budget will be approximately $50 million. The funding provided for the FY 1998 fusion energy sciences program will allow the construction of the National Spherical Torus Experiment (NSTX) at Princeton to continue on schedule, and design efforts on new projects can be undertaken. It will also permit PPPL scientists to greatly enhance collaborations with their colleagues at other fusion facilities in the U.S. and abroad. Furthermore, PPPL will be able to strengthen its world-class theoretical and computational research capabilities and continue the development of non-fusion applications of plasma science and technology.

The FY 1998 budget will also allow continued U.S. participation in the International Thermonuclear Experimental Reactor (ITER) Engineering Design Activity, slated for completion in July 1998. The nation's involvement in ITER has allowed U.S. scientists to remain at the forefront of plasma science and technology and to develop the expertise required for the development of new generations of fusion devices.

The construction and eventual operation of the NSTX device at Princeton is a national effort involving PPPL, the Oak Ridge National Laboratory, the University of Washington, and Columbia University. The new experiment will test an advanced plasma configuration, which could lead to a relatively inexpensive, compact magnetic fusion device capable of producing high levels of power. NSTX is to begin operating in mid-1999.●

Science Bowl Volunteers Needed

Volunteers for the New Jersey Regional Competition of the National Science Bowl®, which will be held at PPPL on Saturday, February 28, are needed. If you are interested in serving as a judge, timekeeper, moderator, scorekeeper, or could assist with logistics, please call James Morgan at ext. 2116.

PPPL Scientists Help Future Teachers

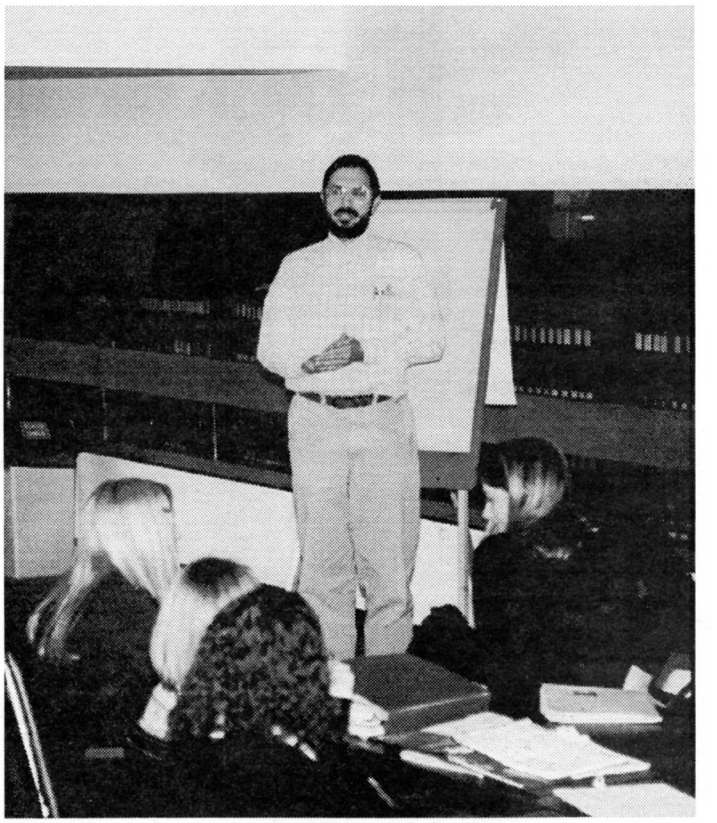
Scientists at the Laboratory worked with future school teachers last month as part of a PPPL collaboration with The College of New Jersey.

Former PPPL'er Sharon Sherman, now a professor at The College of New Jersey, brought about 20 of her education majors to the Laboratory. The undergraduates worked with physicists Norton Bretz, David Mikkelsen, and Greg Schmidt in developing teaching units which they will present in elementary school classrooms as part of their degree requirements. The students brought the teaching modules they prepared and received suggestions and feedback from the researchers, with a particular emphasis on conveying a logical scientific approach to solving problems.

Other activities included a short talk by PPPL's Russell Hulse, who developed the PPPL/TCNJ collaboration with Professor Sherman, and a tour of the Tokamak Fusion Test Reactor.

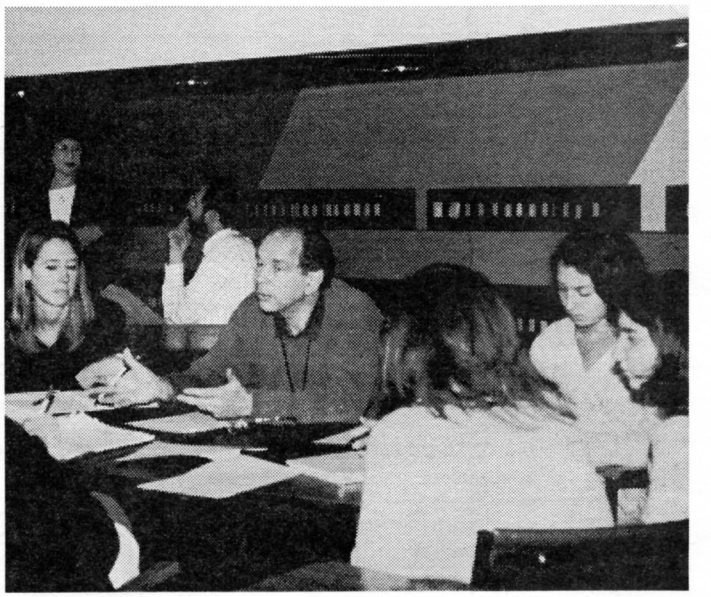
"This is an important opportunity for scientists at the Lab to help society develop positive attitudes toward science and scientists. Teachers play a critical role in this," commented Hulse following the October 20 visit.

The visit is part of an ongoing program to bring the two cultures — K-12 educators and research scientists — closer together. ●



PPPL physicist Russell Hulse delivers a talk about the discovery of the binary pulsar. In 1993, Hulse shared the Nobel Prize in Physics with Princeton University Professor Joseph Taylor for the discovery.

PPPL physicist Norton Bretz works with a group of education students from The College of New Jersey.



PPPL physicist Greg Schmidt participates in activities with the future educators during their visit to the Lab.

HOTLINE

Editor/Writer:	**Patti Wieser**	**Graphic Artist:**	**Greg Czechowicz**
Photographer:	**Elle Starkman**	**Layout:**	**Greg Czechowicz** **Patti Wieser**

The HOTLINE is issued by the Princeton Plasma Physics Laboratory, a research facility supported by the United States Department of Energy. It is primarily an internal publication. Correspondence and requests to reprint material should be directed to the Editor, PPPL HOTLINE, P.O. Box 451, Princeton, NJ 08543; Interoffice correspondence should be addressed to Room B366, LOB Bldg., C-Site; fax 609-243-2751; telephone 609-243-2757; e-mail pwieser@pppl.gov