

At PPPL
THIS WEEK

WEDNESDAY, MARCH 14

GFDL Events and Seminars

Noon - 1 p.m. ♦ GFDL
Smagorinsky Seminar Room

Interactions of Water and Energy Mediate Permafrost Climate Feedbacks

Zack Subin (UC, Berkeley)
www.gfdl.noaa.gov/events

(Gov't, Univ. or 2 other forms of I.D. needed)

PPPL Colloquium

4:15 p.m. ♦ M.B. Gottlieb Auditorium

Evolution in a Contemporary Human Population: Intersexual Constraints and Costs of Reproduction

Stephen Stearns (Yale University)

[CLICK HERE FOR ABSTRACT](#)

THURSDAY, MARCH 15

PPPL Theory Seminar

10:30 a.m. - noon ♦ T-169

Feng Wang and Wei Sheng

GFDL Events and Seminars

2 p.m. - 3:15 p.m. ♦ GFDL
Smagorinsky Seminar Room

Sea Ice in Global Climate Models

Elizabeth Hunke
(Los Alamos National Laboratory)

Physics Colloquium

4:30 p.m. - 6 p.m. ♦ Main Campus
Jadwin A06

Christopher Jarzynski

FRIDAY, MARCH 16

DIII-D Science Meeting

1 p.m. ♦ B-233

SATURDAY, MARCH 17



State-of-the-Laboratory Address

Prager Sees Steady Progress for the Laboratory in the Year Ahead

By John Greenwald

The health of the Laboratory is excellent even as external conditions remain challenging. That was the message that Director Stewart Prager delivered in his annual State-of-the-Laboratory address on March 8. Taking up topics ranging from the NSTX upgrade to proposed budget cut-backs, Prager declared, "The changes that will occur over the next year will likely make the Lab even stronger."

The U.S. fusion community has launched "a broad and sustained effort" to fight the Obama Administration's plan to cut \$49 million, or 16 percent, from the domestic fusion budget in fiscal 2013, Prager said. He called the Laboratory and Princeton University "a very strong part" of this campaign, which includes efforts to convey the importance of fusion research to Congress, President and the public.

Turning to the outlook and priorities for the Laboratory, Prager noted that the NSTX upgrade "gives the Lab a tremendous anchor going forward." He said other key initiatives include enhancing the Laboratory's scientific diversity and excellence in plasma theory, and focusing on the next big steps for the U.S. fusion program.



Stewart Prager

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PPPL Lauds Researchers Bitter, Hill, and Ellis

By Patti Wieser

PPPL honored three fusion energy researchers — Manfred Bitter, Robert Ellis, and Ken Hill — for their scientific accomplishments following the State-of-the-Laboratory address by Director Stewart Prager on March 8. Physicists Bitter and Hill received the Kaul Prize for Excellence in Plasma Physics Research and Technology Development and Ellis, an engineer, received the PPPL Distinguished Engineering Fellow award.

The Laboratory cited the Kaul Prize recipients for their pioneering work in advancing the field of X-ray spectroscopy and technology for plasma diagnostics, with additional potential applications to other areas. The scientists developed a special X-ray imaging crystal spectrometer — an instrument that measures profiles with high spatial resolution of the temperatures and flow velocities of hot plasmas — to gain a better understanding of fusion plasmas. Plasma is a hot gas that makes up the stars and is used as the fuel to produce fusion energy.

The Engineering Fellow was recognized for his outstanding innovation and engineering accomplishments in the development of wave-based heating systems and diagnostic devices for fusion research, and for his leadership in many areas of fusion engineering.

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Awards

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Kaul Prize Recipients

Bitter

Manfred Bitter is a principal research physicist in the Plasma Diagnostics Division at PPPL. He was educated in Germany, where he received a diploma and a Ph.D., both in physics, from the Universities in Munich and Aachen in 1965 and 1968. Prior to joining PPPL in 1977, he was a staff member of the European Space Research Institute in Frascati, Italy, from 1969 to 1973 and a visiting scientist at the Centre des Recherches en Physique des Plasmas in Lausanne, Switzerland, from 1973 to 1977. At PPPL, he co-developed with PPPL physicist S. von Goeler (now retired) the high-resolution X-ray spectroscopy of hot tokamak plasmas for measurements of the plasma ion temperature and plasma flow velocities, using spectral lines of highly charged ions from elements, such as argon, iron, nickel, and krypton. More recently, Bitter invented, and he and Hill developed the novel high-resolution X-ray imaging crystal spectrometer. This new type of spectrometer was installed on many tokamaks and stellarators — types of fusion devices — in the U.S., China, Korea, and Japan, and its instrumental concept has also been adopted for measurements on ITER, an international fusion experiment being built in the south of France. Bitter was named a Fellow of the American Physical Society in 1987 and was one of the recipients of the Alexander von Humboldt Physics Prize in 1996, which allowed him to spend one year of research at the Forschungszentrum Jülich in Germany.

Hill

Kenneth Hill is a principal research physicist working in the Diagnostics Division at PPPL. He received a Ph.D. in atomic physics from the University of North Carolina at Chapel Hill in 1974. Prior to joining PPPL in 1978, he worked in ion-atom collision physics at the U.S. Naval Research Laboratory, and in spectroscopic plasma diagnostics at the Oak Ridge National Laboratory. He is the author or coauthor of more than 320 publications in atomic and plasma physics, and has spent significant time collaborating with and working at research institutes in Japan, Germany, China, and Korea. His focus at PPPL has been on the development of plasma X-ray diagnostics and applying these measurements to study energy transport and impurity behavior. Hill is a member of the American Physical Society.

“Manfred’s and Ken’s award recognizes their development of novel imaging techniques for X-ray based diagnostics. These methods are internationally recognized for their ability to robustly measure plasma temperature and flow profiles, independent of heating methods. The techniques developed by Manfred and Ken have been adopted on many large fusion experiments and have been selected for use on ITER. Due to the unique capabilities of these techniques, they are also being extended to other fields where X-ray diagnostics and optics are important. Manfred and Ken are richly deserving of the Kaul award,” said Michael Zarnstorff, Deputy Director for Research at PPPL.



Award recipients, from left, are Kenneth Hill, Robert Ellis and Manfred Bitter.

Princeton University awards the Kaul Prize to recognize a recent outstanding technical achievement in plasma physics or technology development by a full-time, regular employee of PPPL. It includes a cash award of \$6,000 for each recipient. Former PPPL Director Ronald C. Davidson endowed the Kaul Prize by giving to Princeton University a portion of the gift he received as the 1993 recipient of the Award for Excellence in Science, Education, and Physics from the Kaul Foundation.

PPPL Distinguished Engineering Fellow

Ellis

Robert Ellis is a principal engineer specializing in the design of radio-frequency equipment and diagnostic systems for fusion energy experiments. Ellis received a bachelor’s degree in engineering from Princeton University in 1979, with graduate study at the same institution, before joining the staff at PPPL in 1981. He received a master’s degree in mechanical engineering from the New Jersey Institute of Technology in 1998. He has worked primarily on domestic and international collaborations in fusion energy, designing experimental equipment for laboratories in the United States, England, and Korea. He worked on the JT-60 fusion experiment in Japan as part of a U.S.-Japan exchange program.

“Bob is a versatile engineer well known throughout the national and international fusion community. His development of electromagnetic wave launchers for tokamaks in the U.S. and South Korea, and of techniques to meet National Compact Stellarator Experiment dimensional requirements, among other contributions, has distinguished his engineering talents. Recognition as a PPPL Distinguished Engineering Fellow is well deserved,” said Mike Williams, PPPL Associate Laboratory Director for Engineering and Infrastructure.

The Distinguished Research and Engineering Fellow Program, funded by the U.S. Department of Energy, was created to recognize members of the Laboratory’s research staff, as well as engineering and scientific staff, for their accomplishments. Fellows receive one-time gifts of \$5,000 and qualify for priority in regard to their research and engineering programs. ☺

State-of-the-Lab

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Among the highlights he cited during the hour-long talk: **NSTX:** Researchers have made “discoveries of general importance” over the past year regarding the use of temperature and lithium to improve confinement, Prager said. Advances in computer hardware and software have aided these findings. Meanwhile, construction crews have made “great progress” in readying the test cell for the new neutral beam injector and preparing for the new center stack, while business operations have begun to take delivery of parts for the stack.

Theory Department: Major findings in the past year include the surprising ability of turbulence to increase the current in plasma, and the contribution of reduced turbulence to improved plasma confinement. Prager also hinted at efforts “to build on the current set of superb theorists,” and cited plans to expand the department’s office space.

ITER and Roadmapping: The Laboratory is designing port plugs and other diagnostic tools for ITER, together with in-vessel coils to help control the shape of the ITER plasma. At the same time, the Laboratory has been a leader in roadmapping a path to a commercial reactor. An international workshop held on main campus in September led to plans for annual roadmapping sessions under the auspices of the International Atomic Energy Agency.

Plasma Science and Technology: Prager cited 2011 activities ranging from developing a plasma-based nanotechnology laboratory to delivering a plasma source for a linear accelerator at the Lawrence Berkeley National Laboratory. Among other work in progress, Prager noted experiments to simulate how plasmas spin around black holes, and a novel, field-reversed tokamak that employs internal superconducting coils. Still in the concept stage are plans for a magnetic centrifugal mass filter that could separate highly toxic nuclear waste from less radioactive material.

For the immediate future, Prager announced formation of the Princeton/Max Planck Society Joint Center in Plasma Physics. The new facility will bring the Laboratory together with the Princeton astrophysics department and Germany’s Max Planck Society to study astrophysics and fusion topics. A signing ceremony is to be held on the Princeton main campus later this month. ☐



Kitty Ferguson, above, biographer of physicist Stephen Hawking, gave an informal, non-technical talk about the experience of writing two books about the celebrated cosmologist on Feb. 23, at PPPL. Her colloquium, titled “Stephen Hawking: An Unfettered Mind,” detailed her own decade-long working relationship with the physicist and how she gained his trust and earned his respect for her ability to translate complex scientific ideas into language a general reader can understand. Hawking, who just turned 70, has been severely disabled by Lou Gehrig’s disease. Yet, Ferguson said, he has a mind that still roams to the farthest corners of reality. When he considers tackling a scientific problem or any project, she said, he has one demand. “It should be fun,” Ferguson said. Regarding Hawking’s legacy, Ferguson said that Hawking wants to be remembered for his science, not his disability.

The Future of Nuclear Power Series Available as Five-Week Online Course

You may recall previous fall announcements about the Maclean House Lecture Series on nuclear power with faculty, scientific researchers, and specialists from Princeton University, PPPL, and beyond. Featured speakers included PPPL’s Rob Goldston and Charles Kessel. The Office of the Alumni Association is now excited to bring together these rich resources in a five-week online course, “The Future of Nuclear Power,” for alumni and friends of the University and PPPL from March 15 to April 18, 2012.

From the existing and future applications of nuclear fission power to the developing technology of nuclear fusion, the course will cover the following concepts: history, reactor design, global distribution, economics, safety, environmental impact, future prospects, benefits and more. Registration is open through March 15. A full list of course presenters and an explanation of the two enrollment options (one paid and one free) are available on the Princeton University Alumni Studies webpage at <http://alumni.princeton.edu/learntravel/alumnistudies/spring12/>. ☐

Childcare Info

Princeton University has affiliations with several nationally accredited Childcare Centers. PPPL Employees are eligible to receive a discount from the following centers:

- Harmony School – 10-20% discount**
- Lawrence Day School – 10% discount**
- Lakeview Child Center – 10% discount**

For more information go to:
<http://www.princeton.edu/hr/benefits/worklife/child/>

To view a map of affiliated centers:
[CLICK HERE](#)

COLLOQUIUM

Evolution in a Contemporary Human Population: Intersexual Constraints and Costs of Reproduction

STEPHEN STEARNS
 Yale University

Wednesday, March 14

4:15 p.m. (Coffee/Tea at 4 p.m.)

M.B. Gottlieb Auditorium, Lyman Spitzer Building

Volunteers Needed

Young Women's Conference in Science, Mathematics, Technology and Engineering

hosted by PPPL on the MAIN CAMPUS of Princeton University
 Friday, March 23
 9 a.m. to 2 p.m.

Contact Stephanie Wissel at swissel@pppl.gov



YOUNG WOMEN'S CONFERENCE IN SCIENCE, MATHEMATICS, TECHNOLOGY AND ENGINEERING

March 23, 2012
 Princeton University

BLOOD DRIVE

On Wednesday, March 21 from 8 a.m. to 2 p.m. the American Red Cross Mobile van will be in the Lower End parking lot to collect as many units of blood as we can supply. Please give blood. All blood types are needed.

To schedule a donation appointment, please contact the OMO at ext. 3200.



PPPL Café Menu

BREAKFAST 7 a.m. - 10 a.m.
 CONTINENTAL BREAKFAST..... 10 a.m. - 11:30 a.m.
 LUNCH 11:30 p.m. - 1:30 p.m.
 SNACK SERVICE until 2:30 p.m.

MONDAY, MAR. 12

TUESDAY, MAR. 13

WEDNESDAY, MAR. 14

THURSDAY, MAR. 15

FRIDAY, MAR. 16

COMMAND PERFORMANCE
 CHEF'S FEATURE



Fish and Chips

Pork Roll, Bacon, Egg and Cheese Wrap

Vegetarian Barley Soup

The Triple X Turkey Burger Wrap

Turkey, Swiss Cheese, Cucumber, Mustard Wrap

Ham, Bacon and Cheddar with Chipotle Mayo



Vodka Rigatoni with Grilled Chicken

French Toast Sticks and Sausage

Split Pea with Ham

Double Bacon Cheeseburger with Fries

Waldorf Chicken Salad on a Multi Grain Roll

Crispy Chicken Cordon Blue



Beef Stroganoff

Banana Walnut Pancakes

Pumpkin Bisque

Italian Hot Dog with Onion Rings

Italian Hot Dog with Onion Rings

BBQ Pulled Chicken, Provolone, Sautéed Onion



Santa Fe Chicken over Spanish Rice

Sausage, Egg and Cheese on an Oversized Biscuit

Seven Bean

Chicken Finger Parmesan Hoagie with Fries

Tuna Nicoise on Brioche

Country Fried Steak Panini with Provolone Cheese



Chicken Divan with Steamed Potatoes

Gina's Breakfast Casserole

Minestrone

Chicken Quesadilla with Salsa and Sour Cream

Turkey, Provolone, & Bacon with Cranberry Mayo

Roasted Vegetable, Provolone and Pesto Mayo

MENU SUBJECT TO CHANGE WITHOUT NOTICE

[CLICK HERE FOR A PRINTABLE WEEKLY MENU](#)

WEEKLY

Editor: **Patti Wieser** ♦ Copy Editor /Graphic Design: **Gregory Czechowicz**
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Deadline for calendar item submissions is noon on Thursday. Other stories should be submitted no later than noon on Wednesday.

Send to: pwieser@pppl.gov ♦ Comments: commteam@pppl.gov ♦ PPPL WEEKLY is archived on the web at: <http://www.pppl.gov/ppplweekly.cfm>