PPPL PRINCETON PLASMA PHYSICS LABORATORY
A Collaborative National Center for Fusion & Plasma Research
U.S. DEPARTMENT OF ENERGY
WEEKLY
August 11, 2014

At PPPL THIS WEEK

WEDNESDAY, AUGUST 13

Poster Session for Summer Students
9 a.m. ◆ LSB Lobby

Yoga Class (held weekly)
Noon - 1 p.m. ◆ LSB Commons
Carolyn J. Cohen, Jaya Healing Arts

UPCOMING EVENTS

September 1

Lab Closed
Labor Day Holiday

Guest Corner

"Small Group" Safety Meeting on Office Safety

By **Jerry Levine** - Head, PPPL Environment, Safety, Health and Security

PPPL's Chief Financial Officer Kristen Fischer and I organized a small group safety meeting for the Business Operations Department on July 10 on the general topic of office safety.

Kristen asked for my help in pulling together a safety meeting with her staff because she was troubled by remarks by a number of people who said that much of the safety information disseminated to Laboratory staff didn't really apply to them because there are few hazards in the office environment in which they work. These remarks were consistent with some prior feedback received at safety forums and from safety culture surveys. But they reflect a widespread misperception: In fact, there are many safety hazards in an office and some of our more serious injuries have taken place in offices.

Although the intent was to have a "small group" safety meeting on this topic in a conference room, a series of events changed the venue to the auditorium. Having a larger room to work with, Kristen invited office workers from several other departments and attendance grew to about 50 people.

Kristen began the session by asking participants to fill out and hand in a survey on "what is your greatest office safety concern?" (The results are shown on page 3.) After introducing the purpose of the meeting, I showed a brief YouTube video on injury prevention in offices that summarizes some office hazards and graphically shows how office workers can get hurt.

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"Rip" Perkins, pioneering plasma physicist at PPPL, dies at 80

By John Greenwald

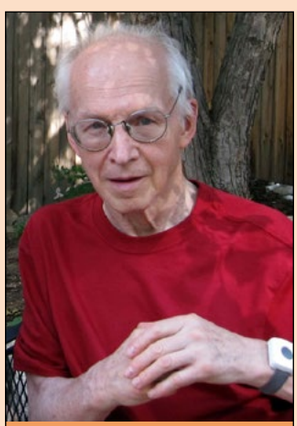
Francis "Rip" William Perkins Jr., a pioneering plasma physicist whose contributions to the U.S. Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL) ranged from seminal advances in fusion energy and astrophysical research to the education of a generation of scientists, died on July 26 in Boulder, Colo. He was 80 and had long battled Parkinson's disease.

During his career at PPPL, which he joined in 1966, Perkins led the Theory Department from 1980 to 1986 and was instrumental in bringing the Magnetic Reconnection Experiment (MRX) — the world's leading facility for studying the process that gives rise to northern lights, solar flares and geomagnetic storms — to the Laboratory. "He had a vision that laboratory experiments can contribute to solving astrophysical plasma problems," said physicist Masaaki Yamada, principal investigator for the MRX.

Perkins went on to head a design team for the initial version of ITER, the international fusion experiment now under construction in France, and was a member of JASON, a select group of scientists that advises the U.S. government on national security and related issues.

"Rip's breadth of knowledge was extremely impressive," said physicist Ernest Valeo, a member of the Theory Department who did research with Perkins. "He had a commanding overview of the problems that we worked on."

Those problems included modeling instabilities caused by the motion of waves in plasma, the hot electrically charged gas that fuels fusion reactions. Perkins brought to the task a personal warmth and good humor that encouraged cooperative efforts. "He was a very friendly and knowledgeable personality and a pleasure to work with," recalled physicist Joel Hosea, an expert on waves in plasma.



Francis "Rip" Perkins

Gaining a nickname

Perkins grew up in Connecticut, where his childhood penchant for sleeping late led his family to dub him "Rip Van Winkle" — with "Rip" sticking as a nickname. He majored in physics at Harvard University and earned his doctorate from Cornell University, where he studied the behavior of waves in the ionosphere, a plasma-filled region of the Earth's upper atmosphere. He worked briefly at Arecibo Observatory in Puerto Rico before joining PPPL.

There he pioneered investigation of the plasma waves used for radio-frequency (RF) heating, a technique employed to help raise temperatures high enough for fusion

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PPPL & Princeton team up for live online chat on Remote Glow Discharge Experiment

By Jeanne Jackson DeVoe

PPPL's Arturo Dominguez and his Remote Glow Discharge Experiment were the stars of a live Google Hangout on July 16 that can be viewed on YouTube.

In the 27-minute Google Hangout, Dominguez chats from the Science Education Laboratory at PPPL with host Daniel Day, Director of News & Editorial Services in the University's Office of Communications, who was based in his office at Princeton.

"I think the Google Hangout medium is great for RGDX because it shows how it's really a live experiment and you can remotely control it," Dominguez said later. "A lot of people have the misconception that it's a simulation but this clearly shows it's actually a live video and you're controlling an actual experiment."

The Google Hangout was coordinated on PPPL's end by PPPL Webmaster Chris Cane with the help of photographer Elle Starkman. "The uniqueness of the RGDX experiment means it lent itself to having a live event using social media," he said. "It lends itself to another level of credibility."

Nearly 50 people viewed the Google Hangout – one of the largest live audiences for a Princeton University Google Hangout, Day said. He and Cane pointed out that the video from the Google Hangout will continue to be viewed on the YouTube site and could be used as an introduction to the RGDX.

The short Google Hangout took hours of preparation to get the audio and visuals working properly, Cane noted. There were two full run-throughs and several more technical run-throughs. But Cane said he would like to do more Google Hangouts in the future for the NSTX-U after it begins operating early next year and for other experiments at the Lab. "I think there's a power in it — it's accessible," Cane said. "It's a way of engaging viewers electronically and digitally that you wouldn't get through traditional media or even a website. "

In the video, Dominguez explains that the experiment is unique in that it allows users to interact with a real plasma physics experiment from a computer anywhere in the world by logging onto www.pppl.gov/rgdx. The RGDX consists of a glass tube connected to a vacuum pump that is encircled by two electromagnetic coils. Electrodes at either end of the device supply the electric field to the plasma. A camera in the device live-streams to the website and users manipulate online controls to create the plasma and make it glow.

Arturo Dominguez explains the RGDX experiment on the Google Hangout.

Chris Cane, front right, and Arturo Dominguez, rear, participate in the Google Hangout.

Dominguez demonstrated how the experiment in the Science Ed. Lab on the first floor of the C Wing at PPPL could be controlled by a computer operated by Jeanne Jackson DeVoe far away on the third floor of the Lyman Spitzer Building. Jackson DeVoe shared her computer screen so that viewers could see her turn off the light on the RGDX and create the plasma by turning on the voltage in the electrodes connected to the device.

Dominguez also showed viewers how the RGDX website offers users supplemental information that explains, among other things, how magnets are able to confine the plasma by trapping the charged particles of the plasma in magnetic fields. This process is essential to plasma experiments like NSTX-U. "In this simple experiment you can really identify a lot of the physics that is very relevant to a Lab like PPPL," Dominguez said.

More than 3,700 people from 109 countries and 49 of the 50 U.S. states have visited the RGDX website since March, Dominguez said.

He noted that he is working on a new feature of the website that would let users do an experiment in which users can determine what voltage is required to create the plasma at different pressures and electrode separations.

Day said RGDX might inspire future plasma physicists. "It's conceivable that someone who's interested in finding clean energy for the world could be playing with this experiment today and could find himself or herself in a few years after a lot of study, working side by side with you in the Lab," he told Dominguez.

"That would be fantastic", Dominguez said. "If this experiment helped convince a high school student of how cool plasma physics is and the importance of getting fusion energy into the future of energy sources, that would be great." Dominguez said. "It's a really promising energy source and I'm really happy that I'm part of it."

Safety Meeting

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Next, Bill Slavin, with assistance from our newest safety engineer, Julia Toth, gave a presentation on "Office Employee Safety Awareness," which addressed a wide range of relevant issues that included, but went beyond, traditional "office" safety. The topics ranged from ergonomics, office equipment and office chemicals to stress and workplace violence.

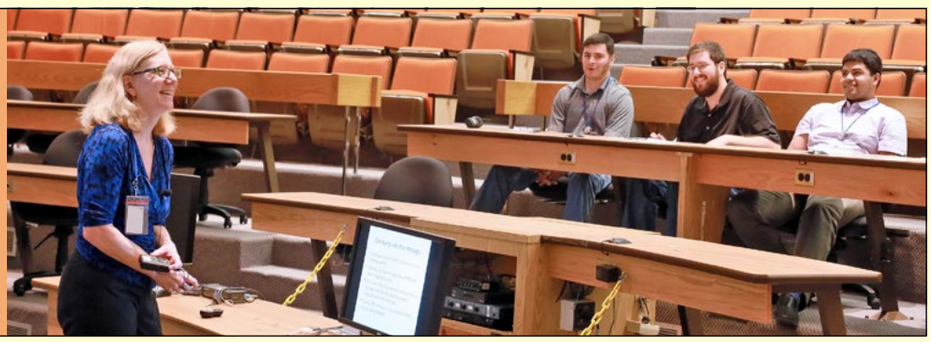
After Bill's talk, I showed a second short YouTube video that challenged everyone to find the hazards in an office environment. (Some were fairly obvious but others were a little harder to pick out; even the safety pros had problems with them!) After the first part of the video went through the entire sequence of hazards, the second half showed the answers and the video was stopped at each hazard to let people shout out the answers before they came up on the screen. After a brief question-and-answer session, the safety meeting ended after lasting about an hour.

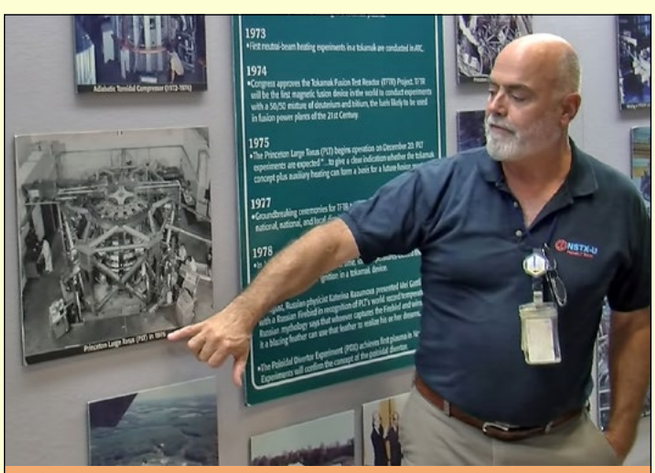
Small (or maybe "moderate") group safety meetings are an effective way to communicate and learn about safety topics of special interest to specific groups. The ESH&S Department is available to work with groups of any size to help facilitate these meetings on all kinds of safety topics. We are already conducting regular small-group safety sessions with several groups at the Lab. Just contact me, Bill Slavin, or other Department managers to help set these up.

I also should point out that the PPPL Safety Wiki now has a new page on Office Safety Topics. Check it out at http://safetywiki.pppl.wikispaces.net/Office+Safety+Topics .

Tour Guide Training

PPPL held a special training session for PPPL tour guides on July 24. PPPL Tours Coordinator Jeanne Jackson DeVoe, in photo at right, gives a presentation to the assembled tour guides. Al von Halle and Arturo Dominguez also gave presentations during the session.





Above, senior tour guide Al von Halle explains one of the lobby displays to the assembled tour guides.

PPPL tour guide Arturo Dominguez, left, answers questions from the assembled tour guides.

Perkins

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to occur in laboratory experiments. Perkins' theoretical work proved prescient: He predicted a type of wave that was only found experimentally some 25 years later and has since proved essential to understanding the impact of RF heating.

As head of the Theory Department, Perkins pushed for bringing theoretical insights to bear on practical experiments. "Not only was Rip perceptive about science, but he had a very focused perspective on deliverables," said physicist William Tang, who worked closely with Perkins and went on to become a successor to him as Theory Department director.

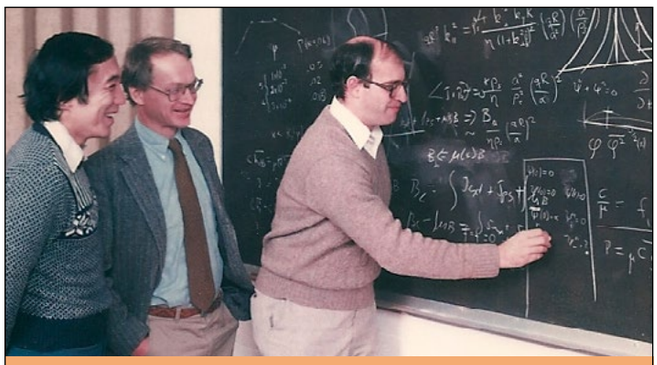
Perkins could have an inspirational impact on students, said physicist Gregory Hammett, a member of the Theory Department who took a course from Perkins while in graduate school in Princeton. Perkins later gave a seminar that aroused Hammett's interest in plasma turbulence, changing the direction of Hammett's career and leading to papers co-authored with Perkins. "'Dedicated' would be the one word to describe Rip," Hammett recalled. "He was dedicated to helping others in scientific enterprises and to working in fusion."

Claire Max, a professor of astronomy and astrophysics at the University of California-Santa Cruz, said Perkins "made all the difference" in enabling her to get through graduate school. "I was struggling," she recalled, "and he had confidence in me and assured me that I would do fine."

ITER design leader

Perkins moved to San Diego in 1993 to head the physics integration unit for the initial design of ITER — a position that he held until 1998 on assignment from PPPL. As head of the unit he coordinated efforts to determine such features as the size of the machine and the amount of heating that would be needed for its optimal operation.

He also created a physics review process that proved "very, very important because it brought people together," said physicist Rich Hawryluk, who heads the ITER and Tokamaks Department at PPPL. "That began the long-term process of having people share data and work together."



"Rip" Perkins, center, as head of the Theory Department with Wei-li Lee, left, and John Krommes, right.

Perkins summed up the results of the unit in a final report that he gave before moving to DIII-D, the fusion facility that General Atomics operates for DOE in San Diego, where he worked on assignment from PPPL until he retired in 2005. "When Perkins gave his report on the physics basis for ITER I was so impressed," said physicist Stephen Jardin, a colleague of Perkins at PPPL who participated in the ITER design effort. "It made me really proud to be a physicist associated with him on that project."

Perkins maintained a deep sense of humanity and devotion to family. He and his wife, Harolyn, raised three children who gave them six grandchildren. "He once referred to children as 'these delightful little creatures,'" recalled physicist Cynthia Phillips, who worked with Perkins on RF heating issues. During gatherings of the JASON group, which met annually in San Diego, "Rip organized theater trips and took kids to San Diego Padres games," said William Happer, a Princeton University physicist who chaired the JASON steering committee. "He was very kind to children and was just a wonderful person in many ways."

In an appreciation of Perkins' achievements, William Tang noted that "Rip's outstanding record of scientific contributions is truly exemplary, and the energy and enthusiasm that he dedicated to the pursuit of fusion will be remembered by all. He will certainly be greatly missed."

Mission accomplished

Workers from Voith Hydro completed weld repairs to D-Site Motor Generator No. 1 with strong support from PPPL staffers. Front row from left: Mounir Awad, Chi Man Cheung, Julia Toth, Grant Shue, Tyler Klunk, Morgan Styer; second row from left: Gene Baker, Bill Slavin, Guy Beck, Ben Markle, Harry Krotz, Colin McFarlane; third row from left: Steve Tureikas, Neil Gerrish, Josh Markle, Richard Jones.

SPD•TIP•OF•THE•WEEK•

PACKAGES AT BOOTH 6

Recently, there have been a few requests by PPPLers to leave items at Booth 6 for vendor (or other) pick-up.

As part of Site Protection's safety and security protocol, packages should not be left at Booth 6 for pick-up by outside individuals. PPPLers with packages for pick-up should contact Material Services (Warehouse/Shipping). All vendor pick-ups should go through the Warehouse/Shipping Office. Nothing should be picked up by vendors without preparing a shipping order (this includes items hand-carried to the vendor).

Please contact the Site Protection Division (Ext. 3208) or Material Services (Ext. 3396) for additional information.

BROCK Café at PPPL Menu

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

*— **MARK GAZO**, Chef Manager*

	MON. 11 AUG.	TUE. 12 AUG.	WED. 13 AUG.	THU. 14 AUG.	FRI. 15 AUG.
COMMAND PERFORMANCE CHEF'S FEATURE	 Ota Ya Sushi Made To Order	 Fettucine Alfredo With Italian Sausage	 Fresh Carved Chipotle Roast Beef With Home Fries & Veggie	 Baked Potato Bar	 Chicken Marsala served over Egg Noodles
EARLY RISER	Blueberry Pancakes with Bacon	Cinnamon Raisin French Toast with Sausage	Cranberry Walnut Pancakes	Western Omelet Wrap	Potato, Bacon, Egg & Cheese Wrap
COUNTRY KETTLE	Vegetarian Black Bean	Chicken Noodle	Minestrone	Tomato Rice	Creamy Vegetable
GRILLE SPECIAL	Double Cheeseburger Hoagie with Onion Rings	Pulled Pork Sandwich with Cole Slaw	3 Cheese & Mushroom Quesadilla with Salsa & Sour Cream	Teriyaki Chicken Steak Wrap Served with Fries	Tofu Cacciatore Sub with French Fries
DELI SPECIAL	Egg Salad with Turkey Bacon on Pumpernickel	Grilled Chicken, Ham, Swiss & Sauteed Spinach on French Bread	Carolina Tavern Roast Pork Sandwich with Herbed Potato Salad	Seafood Salad with Dill On Multigrain Roll	Chicken Breast Club Sandwich
PANINI	Fried Pork Cutlet with Provolone, Tomato & BBQ Sauce	Jersey Stuffed Tomato with Chicken Salad on a Bed of Fresh Greens	Chicken Cordon Blue	Meat Lovers Pizza Quesadilla	Roast Beef, Cheddar, Horseradish, Sweet Peppers on an Onion Roll

MENU SUBJECT TO CHANGE WITHOUT NOTICE

VEGETARIAN OPTION

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	MON. 18 AUG.	TUE. 19 AUG.	WED. 20 AUG.	THU. 21 AUG.	FRI. 22 AUG.
COMMAND PERFORMANCE CHEF'S FEATURE	 Herb Roasted Chicken with Potato & Vegetable	 Spaghetti & Meatballs	 Cowboy Beef Brisket & Ranch Style Bean Taco Salad	 Turkey Tacos with All The Fixin's	 Pan Fried Tilapia with Fresh Tomatoes, Basil & Capers Served with Rice
EARLY RISER	2 Eggs, Choice of Meat & Grits	Strawberry Banana Pancakes with Whipped Cream	Bacon, Egg & Cheese Croissant	Chocolate Chip Pancakes with Bacon	Pork Roll, Onion, Egg, Cheese & Salsa Burrito
COUNTRY KETTLE	Ham, Cabbage Potato	Cream of Broccoli	Cajun Seafood Chowder	Creamy Potato Leek	Turkey Chili
GRILLE SPECIAL	Swiss & Mushroom Burger Served with Onion Rings	Texas Tommy served with Onion Rings	Pork Roll & Cheese Torpedo with Fries	Grilled Chicken Club Sandwich on a Kaiser Roll	Gyro Salad & Pita Chips
DELI SPECIAL	Eggplant, Fresh Mozzarella, Jersey Tomato on Foccacia	Roast Beef & Swiss with Coleslaw & Russian on Rye	Bologna & Salami with Lettuce & Tomato on a Kaiser Roll	The Cubano Pork, Ham Swiss, Pickles & Dijonnaise	Ham & Cheese Club Sandwich
PANINI	Capicola, Fresh Mozzarella & Roasted Red Peppers Torpedo	BBQ Pulled Chicken with Provolone Cheese	Crispy Chicken BLT Ciabatta	Roast Vegetable Panini Wrap	Tuna Melt on Rye

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WEEKLY
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The **PPPL WEEKLY** is currently on a summer bi-weekly schedule. The next issue will be published on **Aug. 25.**