

At PPPL
THIS WEEK



THURSDAY, OCTOBER 4

**4:30 p.m. ♦ Princeton University
Jadwin Hall, A 10**

**Princeton University Physics
Department Colloquium**

**Martin Zwierlein, MIT
A Little Big Bang: Strong Interactions
In Ultracold Fermi Gases**

FRIDAY, OCTOBER 5

**8 a.m. – 1 p.m.
American Red Cross Blood Drive
American Red Cross Mobile Van
Lower End Parking Lot**



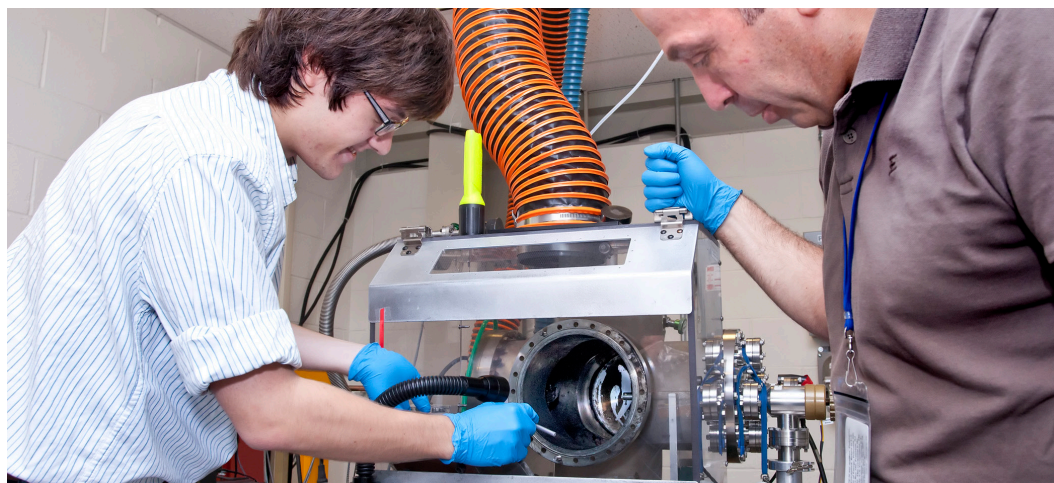
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Nano meets plasma at PPPL:

Lab launches new program as future resource for the world

By John Greenwald



Physicist Yevgeny Raitses, at right, with Washington University undergraduate Mitchell Eagles in the PPPL nanolaboratory.

Scientists at PPPL have launched a new effort to apply expertise in plasma to study and optimize the use of the hot, electrically charged gas as a tool for producing nanoparticles. This research aims to advance the understanding of plasma-based synthesis processes, and could lead to new methods for creating high-quality nanomaterials at relatively low cost.

Nanomaterials, which are measured in billionths of a meter, are prized for their use in everything from golf clubs and swimwear to microchips, paints and pharmaceutical products, thanks to their singular properties. These include exceptional strength and flexibility and high electrical conductivity. Carbon nanotubes, for example, are tens of thousands of times thinner than a human hair, yet are stronger than steel on an ounce-per-ounce basis.

PPPL researchers have launched a nanotechnology laboratory that they envision as a step toward research capabilities that could serve as a resource for institutions and industries around the world. "It could be a test bed for new technologies and devices," said PPPL Deputy Director Adam Cohen. Users could include laboratories looking for small amounts of nanomaterial, "or companies interested in using plasmas in large-scale nanomanufacturing, or anyone in between."

The facility will explore so-called low temperature plasmas that are frequently used to synthesize nanomaterials. Plasmas consist of atoms and detached electrons and atomic nuclei called ions. While the heat in low temperature plasmas can measure tens of thousands of degrees Celsius, they are colder than fusion plasmas, which contain a much higher percentage of ions and can register temperatures greater than millions of degrees Celsius.

Little is known about how low-temperature plasmas function as synthesizing material, said physicist Yevgeny Raitses, the principal investigator for nanoparticle research at PPPL. "We want to understand just what plasma does in order to use it in the best way possible," Raitses said.

Vision of Excellence Award Team Wraps Up Visit to PPPL

By Jeanne Jackson DeVoe

Nine members of a Vision of Excellence Award Team spoke to dozens of people at PPPL last week as part of its assessment of the Laboratory's performance.

Members of the nine-member team, who are not permitted to reveal any information about their identities, met with 30 leaders and managers in 24 scheduled meetings on Monday, Tuesday, and part of Wednesday.

They also talked to 219 scientists, engineers, technicians and administrators in the cafeteria and in hallways where they asked about how people in various positions do their jobs, who their customers are, and how they evaluate their own performance.

John DeLooper, Head of Best Practices and Outreach, who is overseeing the application process, said he was pleased with the visit. He said he is thankful to all the people who made time to meet with the examiners. "I want to express my thanks that these people on short notice twisted their schedules and without a lot of pre-notification, showed off the Laboratory beautifully," he said.

The site team visit is reserved for high-scoring applicants after a lengthy application process for the Vision of Excellence Award in which applicants describe every aspect of their organization from strategic planning to work force focus. The award is the state version of the Malcolm Baldrige National Quality Award, a national award under the U.S. Department of Commerce named for the late Malcolm Baldrige, the U.S. Secretary of Commerce under President Ronald Reagan.

After meeting with PPPL staff, the Vision Team will write its recommendations, which will then be submitted to the judges of the Vision of Performance Excellence Award, who will review all of the applications in mid-October. The awards will be given in November and the final feedback report is expected back by the end of November.

DeLooper emphasized again that the point of the assessment is not to win an award but to get valuable impartial feedback on what PPPL is doing right and on what areas need improvement.

He added that, whatever the results, the Vision Team came away with a positive image of PPPL. "I can say that they were impressed with the work we do," he said. 📷

DOE Celebrates 35th Anniversary



The U.S. Department of Energy will celebrate its 35th anniversary in a ceremony on Oct. 4 at the DOE's headquarters in Washington, D.C.

The DOE has also created a photo gallery highlighting accomplishments in the history of the DOE that will include historic photos of PPPL. The photos are being shown in the DOE's Forrestal Building in Washington DC and can also be seen on the DOE's Flickr site. Click [here](#) to view the photo gallery. For access to live streaming of the ceremony, please email diversity@hq.doe.gov.

The DOE was created in 1977 in the wake of the energy crisis of the mid 1970s when President Jimmy Carter signed the Department of Energy Organization Act to combine all the federal agencies related to energy and appointed James R. Schlesinger as the first Secretary of Energy.

Today, the Department of Energy has 15,000 employees and 100,000 staff employed through contractors to carry out its work.

The DOE will celebrate the occasion with an awards ceremony in which DOE Secretary Steven Chu will recognize the recipients of this year's Department of Energy Secretary's Honor Award, which recognizes employees and contractors "who have provided exceptional service to the American people and citizens of the world." Last year, The Fugitive Emissions Working Group, which includes PPPL, received the Achievement Award for its work cutting emissions of the potent greenhouse gas SF₆. 📷

PPPL Fits Safety Masks for Plainsboro Police Department



Neil Gerrish, an industrial hygienist at PPPL, helps Plainsboro Detective Timothy McMahon make sure his protective safety mask, which protects against a chemical attack, fits properly.

The Environmental, Safety, Health & Security Department is checking the masks of all 40 police officers in the police department.

Nano meets plasma at PPPL: Lab launches new program as future resource for the world

Continued from page 1

PPPL scientists are poised for this task. Laboratory researchers possess decades of experience working with plasmas in fusion experiments and in other areas, ranging from studies of low-temperature plasmas for thrusters for space vehicles and particle beams, to the analysis of astrophysical phenomena. All such work uses electric and magnetic fields to control the plasma, which flows along the magnetic field lines because it is electrically charged.

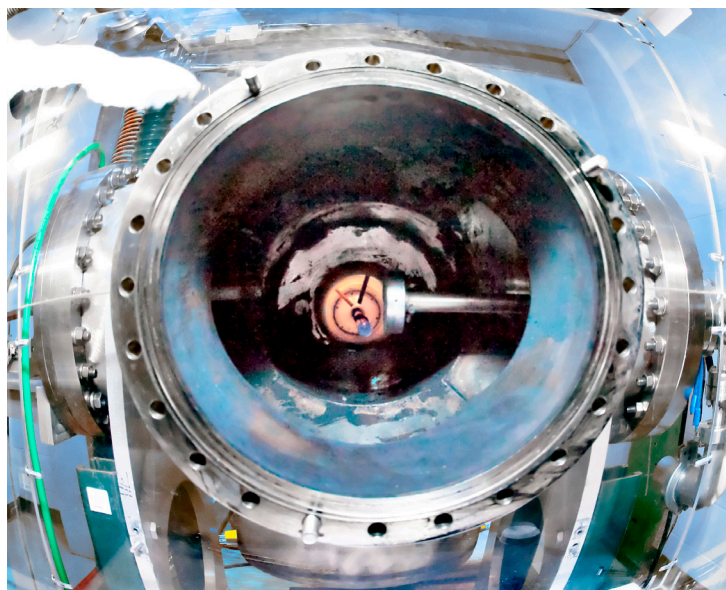
Magnets are among the key components of PPPL's new two-room nanotechnology laboratory, which the DOE approved earlier this year for producing engineered nanoparticles. Magnetic fields control the flow of plasma inside the laboratory's two enclosures, enabling researchers to influence the synthesis of nanoparticles. This control could allow the facility "to fabricate nanomaterials that are not easily fabricated by other means," said lead engineer Charles Gentile, who oversaw the development of the new laboratory.

The facility has so far produced test batches of nanoparticles. These include carbon nanotubes and nanofibers. Both have widespread uses. Future applications could range from body armor to cancer treatments to flexible computer screens.

The production of nanomaterials involves complex transitions between different states of matter when plasma serves as a synthesizing medium. One method vaporizes a substance such as a rod of carbon with a lightning-like electric arc, transforming the carbon from a solid to a plasma. The plasma then condenses back into a solid as nanomaterial. Accompanying these transitions are little-understood chemical, kinetic and electrical interactions that need to be controlled to ensure the quality and purity of the nanomaterial.

PPPL researchers will seek to better understand these interactions to conduct controllable synthesis of nanomaterials with precisely prescribed properties. This research will employ a three-pronged approach that draws upon the resources of many collaborators. Contributions to plasma theory and computer modeling will come from PPPL physicists Igor Kaganovich and Edward Startsev, together with PPPL engineer Andrei Khodak and physicist Predrag Krstić of the Joint Institute of Computational Sciences at the University of Tennessee in Knoxville.

Other disciplines will contribute to the research. Included will be diagnostic techniques developed by physicists Mikhail Shneider of Princeton University and Benoit LeBlanc of PPPL, and by engineer Michael Keidar of George Washington University, who previously collaborated with Raites on the plasma-based synthesis of carbon nanotubes and graphene, a nanomaterial. Princeton University chemical and biological engineer Bruce Koel, and Princeton geophysicist Thomas Duffy will join the research effort, as will engineer Mohan Sankaran of Case Western Reserve University, who has pioneered methods for synthesizing nanomaterial with plasma. All studies will be conducted under the aegis of the PPPL Department of Plasma Science and Technology, headed by physicist Philip Efthimion.




A fisheye lens view of the nanolab reactor chamber.



Technician Enrique Merino harvests nanoparticles.

Discussions for the new PPPL laboratory began in 2009. "The question I always had," recalled Deputy Director Cohen, "is that if nanoparticles and nanotubes are going to be in everything from car cylinders to medical equipment to nano-robots, who's going to ensure that these materials are made consistently with the highest quality? That seemed like an opportunity for us."

Designing and installing the new facility took more than a year. Included is an ultra-low particulate filter ventilation system that ensures the safe operation of the laboratory. Inspiration for much of the overall design of the laboratory came from the Center for Functional Nanomaterials at Brookhaven National Laboratory.

The new facility could serve as the forerunner of a larger one at PPPL. "For me, we've opened up a potential niche with a large area for growth," Cohen said. That growth could include the use of nanomaterial in fusion experiments. "Fusion needs materials that can survive extreme environments, and some of these materials will very likely have 'nano' in their names," Cohen said. "So we're developing ways to make this stuff, and we could be end-users as well." 

FLU VACCINE AVAILABLE NOW!

Call OMO at Extension 3200

To all PPPL Employees,

Influenza is a contagious disease caused by a virus that can be spread by coughing, sneezing or nasal secretions. The best single way to prevent seasonal flu is to get an annual influenza vaccination. By getting vaccinated you can protect yourself from influenza and may also avoid spreading this illness to others.

Flu vaccine appointments are available NOW. Please contact the OMO at extension 3200 for an appointment.

Thank you,
OMO Staff



Register Now for Electric Utilization Training

Electric Utilization Training is being offered on Oct. 17 from 8:30 a.m. to 2:30 p.m. in the MGB Auditorium. To register, please email Sue Hill, shill@pppl.gov or call 2227.



BLOOD DRIVE

October 5, 2012

8:00 a.m. - 1:00 p.m.

The American Red Cross blood supply is at critical levels.

Please help out by donating your blood during the Oct. 5 blood drive from 8 a.m. to 1 p.m. at the American Red Cross Mobile van in the Lower End Parking Lot. All blood types are needed. One pint of donated blood can save up to three lives!

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

Thank you,
American Red Cross
OMO staff



**American
Red Cross**



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 - OCT. 1

TUESDAY - OCT. 2

WEDNESDAY - OCT. 3

THURSDAY - OCT. 4

FRIDAY - OCT. 5

COMMAND PERFORMANCE
CHEF'S FEATURE



Fish N' Chips & Tartar Sauce or Malt Vinegar



Asopao de Pollo



Puerto Rican Turkey Meat Patties w/ Fries & Vegetables



Caribbean Style Crab Cakes w/ Mango Salsa over Mixed Greens



Arroz Con Gandules, Y Pernil

Early Riser

Cranberry Pancakes w/ Bacon

XL Spinach, Onion & Tomato Omelet w/ Home Fries

Egg, Sausage, Onions, Peppers, and Mushroom Quesadilla

Bacon, Egg & Cheese on a Fresh Baked Croissant

Steak, Egg and Cheese on a Torpedo Roll

Country Kettle

Tuscan White Bean w/ Spinach

Mulligatawny

Black Bean

Borscht

Garlic Chicken Broth w/ Spinach

Grille Special

The Home Run Burger

Veggie Burger w/ Jack Cheese, on a Wrap w/ Fries

Italian Cheese Steak w/ Fries

Chicken Quesadilla w/ Sour Cream and Salsa

Grilled Chorizo w/ Onions, Peppers & Jack Cheese w/ Onion Rings

Deli Special

Toasted Turkey Ranchero Hoagie

Crispy Fried Tilapia w/ Cheddar Cheese, Tomato & Tartar

Turkey Pastrami, Cole Slaw, Swiss Cheese & Dressing on Grilled Wrap

Cuban Sandwich on a Crispy Baguette

Toasted Tuna & Cheddar Hoagie w/ Lettuce & Tomato

Panini

Chicken Parmesan

The Italian

Chicken Cheese Steak w/ Onions & Peppers

Turkey, Red Pepper, Provolone, Tomato & Balsamic Vinaigrette

Ham, Pepper Jack, Banana Peppers, Tomato & Spicy Mayo

MENU SUBJECT TO CHANGE WITHOUT NOTICE

WEEKLY

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

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