

## Calendar of Events

### THIS WEEK

#### WEDNESDAY, NOV. 9

**PPPL Travel Voucher presentation by the Travel Office**  
1 p.m. ♦ MBG Auditorium

**PPPL Colloquium**  
4:15 p.m. ♦ MBG Auditorium  
[History and Derivation of the Schrödinger Equation](#)  
Wolfgang P. Schleich, University of Ulm / Texas A&M University

#### NOV. 9-10

**PPPL Advisory Council**

#### NOV. 10-11

**Plasma Hutch 50% Off Sale**  
10:30 a.m.-1 p.m.  
[See page 7.](#)

#### FRIDAY, NOV. 11

**Deadline for benefits changes**

### UPCOMING

#### MONDAY, NOV. 14

**Deadline for Recycling Art Contest**  
[See page 6.](#)

**United Way Kick-off Bake Sale & Contest**  
LSB Lobby  
Bring goodies 9:30 a.m.  
Judging 11 a.m.  
United Way speaker & raffle 11 a.m.

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## PPPL scientists present key results at APS Division of Plasma Physics

By John Greenwald

More than 100 scientists from the U.S. Department of Energy's (DOE) Princeton Plasma Laboratory (PPPL) joined nearly 2,000 others from around the world in San Jose, California, last week to discuss the latest findings in plasma science and fusion research. PPPL physicists contributed to papers, talks and presentations ranging from astrophysical plasmas to magnetic fusion energy during the 58th annual meeting of the American Physical Society (APS) Division of Plasma Physics.

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## PPPL inventors honored for device that creates vital medical isotope

Charles Gentile & physicist Manfred Bitter receive separate award

By Jeanne Jackson DeVoe




PPPL inventors, from left, George Ascione, Charles Gentile, and Adam Cohen in Thomas Edison's library with the Edison Award from the NJ R&D Council. (Photo courtesy of the R&D Council of New Jersey).

A team of scientists at PPPL has received the 2016 Edison Patent Award for their invention of an on-demand method to create a badly needed isotope used routinely in medical imaging devices to diagnose diseases such as cancer and heart disease.

In a glamour-filled evening awards ceremony on Nov. 3, Charles Gentile, head of the Tritium Systems Group at PPPL, accepted the award along with George Ascione, head of the Health Physics Division, from the Research & Development Council of New Jersey. Adam Cohen, Deputy Undersecretary for Science and Energy at DOE, who was deputy director for operations at PPPL when he worked on the technology, also received an award but was unable to attend. The three were honored at a ceremony at the Liberty Science Center in Hoboken, New Jersey.

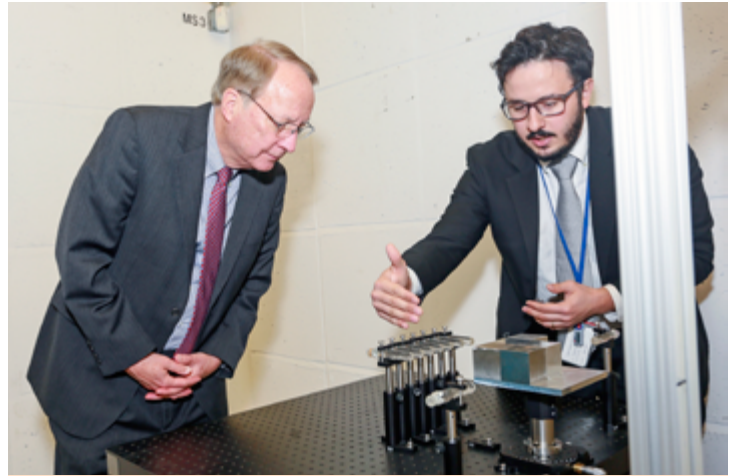
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# NNSA administrator visits Princeton Plasma Physics Laboratory

NNSA administrator Lt. Gen. Frank Klotz (Ret.) visited PPPL on Oct. 28 and met with researchers working on Lab projects supporting NNSA missions. Among these were a [high-resolution diagnostic system](#) for the National Ignition Facility and a [nuclear verification system](#) that may be useful in future disarmament agreements. [Lt. General Klotz's blog about his visit is available here.](#) 



Lt. General Klotz discusses a new X-Ray spectrometer developed at PPPL with Lan Gao, left, and Ken Hill, physicists at PPPL. (Photo by Elle Starkman)



Sebastien Philippe, right, a graduate student in the Department of Mechanical and Aerospace Engineering at Princeton University, shows Lt. General Klotz the zero knowledge protocol experiment at PPPL that he helped create along with Robert Goldston, Princeton professor of astrophysical sciences and former director of PPPL. (Photo by Elle Starkman)



Lt. Gen. Frank Klotz (Ret.), NNSA administrator, visits with leaders and scientists at the PPPL. (Front row, from left: Terry Brog, Interim Director of PPPL; Lt. Gen. Frank Klotz, NNSA Administrator; Dave McComas, Princeton University VP for PPPL; Back row, from left: Rob Goldston, Princeton professor of astrophysical sciences and former director of PPPL; Phil Efthimion, head, Plasma Science and Technology Department; Pete Johnson, head, Princeton Site Office, U.S. Department of Energy; Amitava Bhattacharjee, head, Theory Department; Michael Zarnstorff, deputy director for research; Nathaniel Fisch, director, Princeton University Program in Plasma Physics; Sebastien Philippe, Princeton University graduate student.) (Photo by Elle Starkman)

## It's time to get your flu vaccine!

Influenza is a contagious disease caused by a virus. It can be spread by coughing, sneezing or nasal secretions.

By getting the flu vaccine, you can protect yourself from Influenza and may also avoid spreading this illness to others.

**Please call the OMO at extension 3200 to make an appointment.**



## Spreading the word about green purchasing program



Three PPPL members who have helped lead PPPL's award-winning green purchasing program discussed the Laboratory's efforts to purchase green electronics and green office and cafeteria supplies to 100 people from New Jersey companies, municipalities, organizations, and institutions at a meeting of the New Jersey WasteWise Network. The Nov. 2 meeting was held at the New Jersey Forensic Science Technology Center Auditorium in Hamilton, New Jersey. The Laboratory this year received two national awards for its green purchasing program: a silver Green Buy Award from the U.S. Department of Energy and a three-star EPEAT Purchase Award from the Green Electronics Council. From left: Margaret Kevin-King, building and grounds supervisor; Kyrion Jones, excess property coordinator; and Leanna Meyer, environmental scientist. (Photo courtesy of John Bennevich)

## APS

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Topics included 14 presentations posted as news releases in the meeting's [virtual press room](#) during the October 31–November 4 event. Findings from PPPL include:

### [Launching Fusion Reactions Without a Central Magnet, or Solenoid](#)

Creating ring-like objects called “plasmoids” can do the trick.

### [A Disappearing Feast: Mean Flows Remain Slim After Eating Eddies](#)

Research at PPPL shows that the popular predator-prey model doesn't work.

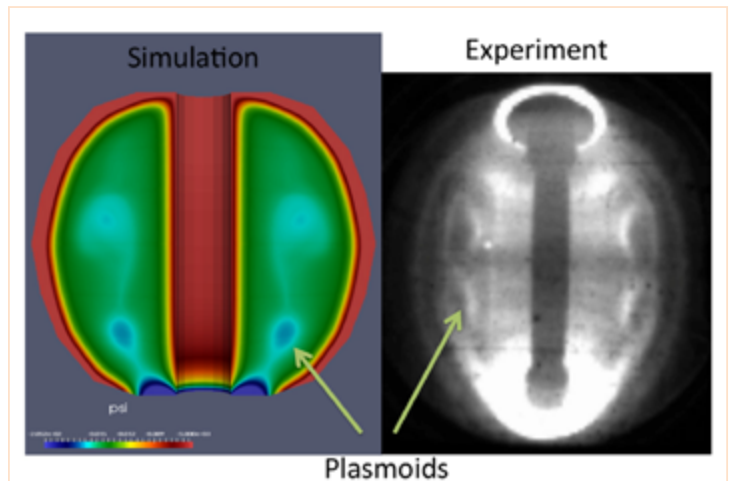
### [Steering a Fusion Plasma toward Stability](#)

Researchers show how to avoid instabilities, and potential damage to a fusion device, using an easily understood stability map.

Among other presentations was a graduate student paper on simulating a method for reducing instabilities:

### [Princeton graduate student Imène Goumiri creates computer program that helps stabilize fusion plasmas.](#)

Included during the week-long event was a Plasma Sciences Expo staffed by physicists and sponsored by the APS Division of Plasma Physics and the DOE. The hands-on Expo, held for the general public on Thursday, Nov. 3, and school groups on Nov. 3 and 4, enabled creation of arcs of lightning and other examples of plasma, which makes up 99 percent of the visible universe and often is called the fourth state of matter. Also scheduled during the meeting was a Science Teachers Day featuring instruction and workshops on November 1.



Simulation of plasmoid, left, and fast-camera image of experiment showing two plasmoid-like structures. Images taken from PPPL release, “Launching Fusion Reactions Without a Central Magnet, or Solenoid.” Simulation by Fatima Ebrahimi, PPPL; fast-camera image by Nishino-san, Hiroshima University.

The American Physical Society is a non-profit membership organization working to advance knowledge of physics through research journals, scientific meetings, and education, outreach, advocacy and international activities. APS represents some 53,000 members, including physicists in academia, national laboratories and industry in the United States and throughout the world. The Division of Plasma Physics was established in 1959, with its first elected chair the late Melvin B. Gottlieb, a former director of PPPL. 📧

# Edison Award

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“We’re gratified to receive this award,” Gentile said. “There was a lot of work that went into this and we’re just happy that we can potentially make a positive impact on helping people in the world who would not necessarily have access to this diagnostic technology.”

“This is an excellent example of how research can lead to unexpected results,” Ascione added. “Our experiments in fusion and plasma physics led us to a technology that could benefit millions of people around the world. There’s no greater honor than to receive recognition named for this country’s greatest inventor, Thomas Alva Edison.”



The Edison Patent Award was also given to the Princeton Plasma Physics Laboratory. (Photo by Laurie Bagley)

In addition to the award, the inventors each received a resolution from the New Jersey Assembly recognizing their achievement.

“This House hereby recognizes Charles Gentile, Adam Cohen, and George Ascione, pays tribute to their meritorious record of service, leadership, and commitment as exemplified by the Edison Patent Award in the Medical Technology Category, and extends its best wishes for continued success” the resolution states. The resolution, prepared for all 40-plus New Jersey inventors who received awards, was made

possible by Andrew Zwicker, head of Science Education and a New Jersey assemblyman.

The trio’s invention could help fill a global need for the radioactive element Technetium 99-m (Tc-99m), the substance used in two-thirds of nuclear medical diagnostic procedures and part of a multi-billion-dollar radioisotope industry. The inventors received a patent this year. They received third prize at Princeton University’s Keller Center’s 11th Annual Innovation Forum in February for the device, which they began work on in 2009. Gentile told judges that the inventors could produce a prototype of the device within a year.

“PPPL produces more than research on plasma and fusion energy,” said Laurie Bagley, PPPL’s head of Technology Transfer. “This award recognizes our Lab researchers who think out of the box to produce technologies that can make the world a better place.”



The award winners with their wives: Left to right: Leanne Gentile, Charles Gentile, George Ascione, and Catherine Saville. (Photo by Larry Bernard)



Charles Gentile, at the podium, and George Ascione accept the 2016 Edison Patent Award at the Nov. 4 ceremony at the Liberty Science Center. (Photo by Larry Bernard)


There have been shortages of the material in recent years due to unexpected maintenance shutdowns of nuclear reactors. The refrigerator-sized device can produce Tc-99m on-site in a hospital or doctor’s office, eliminating the need to transport it great distances. This could make the substance more available to third-world countries, Gentile said. And unlike the production of Tc-99m in nuclear reactors, there is no danger of nuclear proliferation associated with the device because it does not use uranium.

Doctors inject Tc-99m into patients primarily in bone and brain scans. It is used to help diagnose conditions ranging from heart disease to cancer. The isotope emits gamma rays that scanning devices can easily trace. Since the substance has a half-life of six hours, the radiation exposure to patients is kept to a minimum. But the half-life also makes it difficult to ship to third-world countries that are more than six hours away from the reactors that produce the substance.

In addition to the Edison Award, Gentile also received an Innovator’s Award from the New Jersey Inventors Hall of Fame, cosponsored by the Stevens Institute of Technology, on Oct. 27.

Joining Gentile was PPPL physicist Manfred Bitter, who received an Innovator’s Award for his patented invention of a new type of X-ray crystal spectrometer using a new class of focusing crystal surfaces. The device uses intense beams of ultraviolet light called “extreme ultraviolet” or EUV. It could be used to improve spectroscopy (measuring and investigating spectra produced by light from electromagnetic radiation) and microscopy (microscopes). The device could lead to substantial advancements and cost savings in EUV lithography (printing integrated circuits), which is critical for manufacturing the next generation of integrated circuits.

PPPL’s Christopher Brunkhorst won the Innovator’s Award in 2015, along with David Geveke, a USDA scientist, and Andrew Bigley, a USDA engineering technician, for his invention of a novel technique for pasteurizing eggs by using radio frequency heating.

These and other technologies will be on display Nov. 10 at the Celebrate Princeton Innovation 2016 on the Princeton University campus. Sponsored by the Office of the Dean for Research, the event honors Princeton inventors and collaborators. 

Larry Bernard contributed to this story.



## A glimpse of whales and tons of fish on year's second fishing trip

More than 25 PPPLers and their families set off aboard the Suzie Girl fishing boat out of Belmar, New Jersey, on Saturday, Oct. 29, for the second fishing trip of the year. Not only did they catch numerous striped bass, they also caught sight of several whales swimming nearby. Andy Carpe and Bob Tucker Jr. organized the trip. 📷



Charles Hughes shows off his catch as his brother Lester looks on. (Photo by Andy Carpe)



Xiaoman Cheng fishing. (Photo by Andy Carpe)



The fins of a whale nearby the fishing boat. (Courtesy of Theresa Anguiano)



Scott Gifford, left, who caught the biggest fish at 35 pounds, with his son Andy. (Photo by Andy Carpe)

## United Way kicks off with PPPL Department Bake Sale and Contest

PPPL is sponsoring a PPPL Department Bake Sale and Contest to raise money for United Way on **Monday, Nov. 14**. Judging will take place at **11 a.m. in the LSB lobby**, followed by a drawing for preferred parking spots.

Please bring your home-baked or store-bought cookies, cakes, and other goodies to the **LSB Lobby at 9:30 a.m.** Creativity is encouraged!

**Sign up by having a representative from each department contact Ricardo Marquez at [rmarquez@pppl.gov](mailto:rmarquez@pppl.gov), ext. 2221 no later than Nov. 11.**

# Open Enrollment 2017

**Annual Benefits Open Enrollment began Oct. 17 and ends Friday, Nov. 11. Nov. 11 is the last day to make any benefit changes.**

## Recycling art contest and lunchtime movies highlight America Recycles Day Nov. 15

**A recycling art contest and lunchtime movies about recycling highlight PPPL's events for America Recycles Day on Nov. 15.**

**The short movies, "How Recycling Works" and "Computer Recycling," will be shown in the MBG Auditorium on Nov. 15 at 11:45 a.m. with free snacks for audience members.**

Creative PPPL'ers can submit their recycling artwork or fashion piece to the Recycling Art Contest on Nov. 14. The pieces will be on display from Nov. 14 to 18 and staff members will vote for the winners. The artists with the most votes will receive gift certificates to the Plasma Hutch. Examples of recycled art are in the cafeteria.

"Materials always have more life in them if you take a moment to think about it," said Dana Eckstein, a member of the Green Team who is helping to organize the event. "Don't be afraid to be creative!"

The Green Team will once again be catching staff members with sustainable practices in the cafeteria and awarding prizes in the "Get Caught Green Handed" contest.

### **Other America Recycles Day activities include:**

- Sign a recycling pledge and get a sticker on Nov. 15 in the LSB Lobby.
- Bring your home electronics to recycle for the UNICOR electronics recycling drive on Nov. 15 from 7:30 to 10 a.m. at the warehouse roll-up door opposite the firehouse. ([See page 8](#))
- Donate clean, gently-used clothing in the America Recycles Day Clothing Drive Challenge for the Trenton Rescue Mission Nov. 2 to 20. ([See page 9](#)).
- Recycle office supplies and personal protective equipment in Terra Cycle bins in the LSB lobby and the stockroom. ([See page 7](#))

**Questions? Contact Margaret King, ext. 3652, Dana Eckstein, ext. 2588, or Leanna Meyer, ext. 2599.**

## Terra Cycle is collecting office items to recycle in the LSB lobby and personal protective equipment in the stockroom.

### Allowable office items:

- Staples
- Scissors
- Pens, markers & highlighters
- Tape, clips, rubber bands
- Mouse pads
- Transparencies

### Personal Protective Equipment & other items:

- Eyewear
- Cloth/fabric
- Work gloves
- Transparencies
- Wrappers & miscellaneous plastic

Please do not discard electronics, organic items or hazardous waste.

## Registration for 2017 Young Women's Conference is open!

Registration for the 2017 Young Women's Conference in STEM, taking place on Thursday, March 23, at Princeton University's Frick Chemistry Building, is now open. If you are interested in bringing your student to the YWC, please [follow the link](#) and register up to three seventh- to tenth-grade students.

If you or anyone you know might be interested in exhibiting at the next YWC, please contact Deedee Ortiz, [dortiz@pppl.gov](mailto:dortiz@pppl.gov), ext. 2785.

## Plasma Hutch Sale

### ALL ITEMS 50% OFF!

**Start your holiday shopping early at the hutch!**

Give your loved ones the gift of PPPL or get yourself something nice!

**When:** 11/10 & 11/11 from 10:30 a.m.-1 p.m.

**Where:** LSB Lobby

# Donate to the United Way

The Princeton University United Way Campaign takes place **Nov. 1 to Nov. 30**. Employees can give a one-time contribution or donate a certain dollar amount from their paychecks. They can opt for donations to specific causes or initiatives or a non-profit agency of their choice.

**\$25 can buy 100 meals to local food banks**

**\$60 can provide three literacy kits**

**\$150 can provide help for 10 students to go to college**

## UNICOR Electronics Recycling

You may bring the following items from home for recycling on Tuesday, Nov. 15.

### Electronic Gadgets:

- Cameras (Handheld & TV Systems)
- Camcorders
- MP3 Players
- Gaming Systems
- Calculators
- Microscopes
- Telescopes
- PDAs

### Household Equipment:

- Televisions
- Cable Boxes
- Telephone Systems
- DVRs
- Copiers/Printers/Faxes

### Computer Equipment:

- Laptops
- Desktop Towers
- Modems
- Keyboards
- Mouses
- Monitors (CRT & LCD)
- Printers
- Computer Wires
- Hard Drives
- DVDs/Tapes
- Circuit Boards Drivers

**All items will be collected in front of the warehouse roll-up door opposite the firehouse from 7:30–10 a.m. Do not bring items to the lobby.**

**Any questions please contact M. King ext. 3652 or L. Meyer ext. 2599**



# Andlinger Center hosts lecture on reducing the cost of Fusion Energy

Steven Cowley, president of Corpus Christi College at Oxford University, will discuss, “Driving Down the Cost and Scale of Fusion Energy,” as part of the Princeton University Andlinger Center for Energy and the Environment’s 2016-2017 Highlight Seminar Series on **Nov. 9 at 4 p.m.** The seminar will be held in Maeder Hall at the Andlinger Center, located on the corner of Prospect Avenue and Olden Street in Princeton. The lecture will be followed by a reception. [More details on the talk and a biography of Cowley are available here.](#)

# COLLOQUIUM

## History and Derivation of the Schrödinger Equation

$$H(t) |\psi(t)\rangle = ih \frac{d}{dt} |\psi(t)\rangle$$

**Wolfgang P. Schleich**  
University of Ulm / Texas A&M University

**Wednesday, Nov. 9**  
4:15 p.m., M.B.G Auditorium, Lyman Spitzer Building

## PPPL America Recycles Day Clothing Drive Challenge for The Trenton Rescue Mission

Please deposit clothing that is clean, gently used, and in usable condition in the collection box Nov. 2-20.

**Drop off locations: LSB Lobby, Lab Building (by lower lot entrance)**

# Shred your old business documents!

PPPL will hold a shredding event on Nov. 9 at the warehouse receiving area in the lower parking lot for staff to shred old PPPL business-related records and documents.

Go to <https://goo.gl/Qm2O6o> to submit a work order for your shredding requirements. Record retention and destruction guidelines are available at <http://sportal.pppl.gov/bp/Lists/RecordsSchedule/Allitems.aspx>.

For more information, contact Dean Peterson, [dpeterso@pppl.gov](mailto:dpeterso@pppl.gov), ext. 3998.

**BROCK**

**NICK PETTI**  
Chef Manager



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.

	Monday November 7	Tuesday November 8	Wednesday November 9	Thursday November 10	Friday November 11
COMMAND PERFORMANCE <b>Chef's Feature</b>	<b>Zesty Orange Chicken &amp; Broccoli</b> over Rice	<b>Vegetarian Chili</b> over Rice with Cornbread	<b>Pork Carnitas Burrito</b> with Beans	<b>Beefaroni</b> with Garlic Breadstick	<b>BBQ Chicken,</b> Baked Beans & Fried Okra
Early Riser	<b>Breakfast Club Sandwich</b>	<b>Greek Egg White Omelet</b> with Spinach, Tomato, Peppers & Feta Cheese	<b>Breakfast Pizza</b> with Ham, Bacon & Sausage	<b>Omelette Florentine</b> with Spinach, Tomato & Mozzarella	<b>Breakfast Tacos</b>
Country Kettle	<b>Mushroom Barley</b>	<b>Pasta Fagioli</b>	<b>Chicken &amp; Quinoa</b>	<b>Tomato Spinach Lentil</b>	<b>Seafood Bisque</b>
Grille Special	<b>Colossal Burger</b> with 2-5.3 oz. patties, American Cheese, Lettuce, Tomato & Onion	<b>Pepperoni Pizza Steak Sandwich</b> with Fries	<b>Tuna Melt</b> on Rye served with Onion Rings	<b>Taco Dogs</b>	<b>Spinach Salad</b> with Turkey Bacon, Hard-Cooked Egg, Mushrooms & Raspberry Vinaigrette
Deli Special	<b>Stacked Veggie Sandwich</b> with Guacamole	<b>French Dip</b> with Swiss Cheese, Caramelized Onion & Horseradish Cream served with Potato Wedges	<b>Prosciutto, Pesto,</b> Roasted Peppers & Arugula on Ciabatta	<b>Crab Cake</b> on a Kaiser with Lettuce & Tomato	<b>Buffalo Chicken Wings</b> with Blue Cheese, Fries & Celery
Panini	<b>The Cubano</b>	<b>Swedish Meatball Hoagie</b>	<b>Southwest Turkey,</b> Peppers & Cheddar with Jalapeno Ranch Spread	<b>Tomato &amp; Fresh Mozz</b> on Ciabatta with Basil, Red Onion & Arugula	<b>Turkey French Dip</b> with Swiss Cheese

MENU SUBJECT TO CHANGE WITHOUT NOTICE

HEART HEALTHY

VEGETARIAN OPTION

**WEEKLY** Editor: **Jeanne Jackson DeVoe** ♦ Layout and graphic design: **Kyle Palmer** ♦ Photography: **Elle Starkman** ♦ Science Editor: **John Greenwald** ♦ Science Writer: **Raphael Rosen** ♦ Webmaster: **Chris Cane** ♦ Communications Director: **Larry Bernard**

The PPPL WEEKLY is published by the [PPPL Office of Communications](#) on Mondays throughout most of the year and biweekly during the summer, except for holidays.

**DEADLINE for calendar item submissions is noon on WEDNESDAY. Other stories should be submitted no later than noon on TUESDAY.**

Comments: [commteam@pppl.gov](mailto:commteam@pppl.gov) ♦ PPPL WEEKLY is archived on the web at: <http://w3.pppl.gov/communications/weekly/>.