

At PPPL  
**THIS WEEK**

MONDAY, FEB. 25

**Andlinger Center Seminar**  
4:30 p.m. ♦ Main Campus,  
Computer Science Auditorium 104

Using Economics to Increase the  
Intelligence of the Smart Grid

Frank Wolak, Stanford University

THURSDAY, FEB. 28

**PPPL Colloquium**  
4:15 p.m.\* ♦ MBG Auditorium

Unique Vulnerability of the NY/NJ  
Metro Region to Hurricane Destruction - A New Perspective Based on  
Recent Research on Irene 2011 and  
Sandy 2012

Nicholas K. Coch,  
Queens College CUNY

Refreshments at 4 p.m. in the LSB Lobby

\* Please note special date & time

**Hamilton Colloquium Series**  
4:30 p.m., Jadwin Hall, A10

What drives electronic nematicity in  
the iron-based superconductors

Abhay Pasupathy, Columbia University

SATURDAY, MARCH 2

**Science on Saturday**  
9:30 a.m. ♦ MBG Auditorium

Light and nanotechnology -  
engineering and so much more

Claire Gmachl, Princeton University

UPCOMING EVENTS...

Mar. 13  
**Carebridge Seminar**

"Thinking Your Way to Healthy  
Eating"

11:30 a.m. ♦ H.R. Training Room

Mar. 22  
**Young Women's Conference  
in Science, Mathematics,  
Technology and Engineering  
at Princeton University**

9 a.m. - 2 p.m.

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## Accolades for CIO: Steve Baumgartner takes the helm of national group

By Jeanne Jackson DeVoe

Steve Baumgartner was recently named a finalist for the 2013 NJ Technology Council (NJTC) CIO of the Year for his work as the head of PPPL's information technology department and he officially became chair of the National Laboratories Chief Information Officers (NLCIO) group at the beginning of this month. But if you're looking for someone to tell you why he deserves all these accolades, it won't be Baumgartner himself.

He is characteristically self-effacing about both the award and his position leading a group made up of the chief information officers of all the national laboratories. "My peers thought enough of me to elect me chair of the organization – I must have done something to impress them," he said modestly. "I just don't know what that might be other than I have hung around for seven years."

Adam Cohen, PPPL's Deputy Director for Operations, has no such compunctions. He cited many of Baumgartner's accomplishments when he nominated Baumgartner for the NJTC CIO of the year award, for which Baumgartner is one of four finalists. "He successfully balances the myriad of services demanded by our employees and visitors, from electronics support for diagnostics to business computing to networks and personal computer support," he said in the nomination.

Ron Strykowski, who has worked with Baumgartner on the NSTX upgrade and many past projects, said he wasn't surprised to learn Baumgartner had become chairman of the NLCIO. "The quality that he brings to the party is his ability to work really well with people," said Strykowski, the project manager of the NSTX upgrade. "He doesn't overreact, he doesn't get emotional, he's very fact-driven in trying to get to the core understanding of what the issues are and trying to come up with a solution."



Steve Baumgartner

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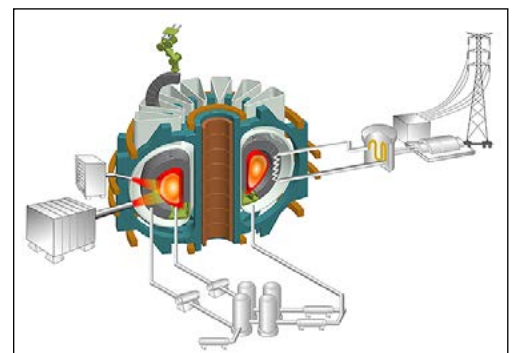
## Previewing the next steps on the path to a magnetic fusion power plant

By John Greenwald

Scientists around the world have crossed a threshold into a promising and challenging new era in the quest for fusion energy. So said Advanced Projects Director Hutch Neilson in remarks to the 2013 annual meeting of the American Association for the Advancement of Science (AAAS) in Boston.

The new phase has begun with the construction of ITER, Neilson said during his talk on Feb. 16. With construction of ITER under way, many national fusion programs "are embarking on their own projects to demonstrate the production of electricity from fusion energy," Neilson said.

These nations are considering "DEMO" programs that would mark the final step before the construction of commercial fusion facilities by midcentury. Such



Schematic sketch of the proposed K-DEMO fusion facility.  
(Courtesy: South Korea's National Fusion Research Institute)

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## Latest trends in information technology

Cohen said Baumgartner's position as chairman gives him an inside view of the latest trends in information technology issues, such as cybersecurity. "It's wonderful because he gets to interact with the folks at the highest level at the DOE and really guide them in terms of how the Department views cybersecurity," Cohen said. "Steve will be in a leadership position with his peers, which is always good."

In fact, Baumgartner has been on the job since November when his predecessor, Tom Harper, the former chief information officer at Los Alamos, left to take another job and Baumgartner had to step in to the position earlier than expected.

The NLCIO is made up of chief information officers from the Department of Energy's national laboratories and plants who share information with each other, advise the Laboratory directors and provide information and feedback to the Department of Energy about cybersecurity and information technology. They also occasionally provide feedback to other federal agencies, such as the Office of Management and Budget (OMB).

As chair, Baumgartner presides over the group's monthly conference calls and quarterly meetings, like the meeting last week in Berkeley, Calif. He works with the DOE's CIO, Robert Brese, and the NLCIO's executive committee on IT issues facing the DOE complex. The group recently discussed how recent conference regulations from the OMB affect information technology and also discussed cyberattacks targeting DOE headquarters and the laboratories, for example.

## A demanding job

The job of chairing one of the National Laboratory groups is a demanding one, said Ed Winkler, PPPL's chief financial officer, who is a member of the National Laboratory Chief Financial Officers group. "That's a big investment in time and effort so that's something that's very commendable," he said.

The exchange of information among the members of the NLCIO group can be valuable. In 2010, for example, Baumgartner learned that one of the national laboratories was considering using Google for its email so that employees could access their email, calendars and document sharing in the cloud from anywhere, on any platform. He began promoting a similar idea for PPPL in June of 2010 as a replacement for an aging email system and PPPL eventually went live on Google in November of 2011.

The group also issues reports on information technology issues at national laboratories. In 2011 it issued a report on green IT computing. Last year's report on "Leadership in Cloud Computing," calls for laboratories to put more of their systems in "the cloud." The group is now working on another report on how employees can use mobile devices like iPads and other tablets in the laboratories.

Baumgartner hasn't always been in the information technology field. In fact, he has an MBA from Fairleigh Dickinson University in accounting. The first 20 years of his career he held various positions in accounting and finance primarily working for W.R. Grace & Co. at divisions in New York; Reno, Nev.; Chicago, and Somerville, N.J. In 1993 he became a software consultant for EPICOR software where he implemented enterprise accounting systems in a territory that ranged from Boston to Washington DC. While there, he won the President's Cup award three times as one of the top 10 EPICOR consultants worldwide, an honor that came with free trips to Hawaii and Australia.

When Baumgartner first became CIO in 2005 there was virtually no cybersecurity system and documentation, he said. "We had nothing, we had zero," he recalled. All of the laboratories had to create and document cybersecurity programs under the Federal Information Security Management Act and have them certified and accredited by the DOE. "That was a big time when we were all learning, all the labs had to go through the same process," he said. "The DOE sent around 'Site Assist Visit' teams to grade the various cyber programs. PPPL's cyber program was ranked in the bottom third of the Office of Science laboratories. We're now seen as one of the better cyber programs in the complex."

Baumgartner was first hired in 2001 to help install a new business software system and a decade later he is overseeing the effort to replace that system, which is now outdated. Winkler worked with him on the first effort. "He inspires confidence in the advice and counsel that he gives," Winkler said. "He's available, he's helpful. He doesn't panic. He basically reacts to issues in a thoughtful, measured manner."

Cohen's NJTC Award nomination noted that, "Steve works extensively on process and technical improvements to keep us as much as possible at the leading edge of the improvement wave, and most importantly, keeps the staff informed of changes and actions needed to maximize our IT posture."

A native of North Arlington in Northern New Jersey, Baumgartner and Kristin, his wife of 26 years, live in Skillman near the Sourland Mountain Preserve with their dog Sandy, a Welsh terrier. Kristin works in IT Communications for Bristol-Myers Squibb. The two are big golfers and Baumgartner was on the board of directors of the Hopewell Valley Golf Club for many years. Baumgartner plays in the Princeton University Golf League with his golf partner John Wheeler, a former PPPL employee.

Baumgartner admits that he is low-key when it comes to his own accomplishments but he's more enthusiastic about promoting a team, whether it's his department at PPPL or the NLCIO. "I'm usually not very positive when I talk about myself," he said. "When I talk about the team, I start to get jumped up." 📍

## Summer Camp Expo at Princeton University March 5

If you're looking for ideas about where to send your child this summer, you might want to stop by the Summer Camp Expo at Princeton University on Tuesday, March 5 from 10 a.m. to 2 p.m. at the Frist Campus Center, Multipurpose Rooms B and C. The Expo will include dozens of local day and sleep-away camps for kids of all ages and interests and representatives can provide information about activities, age requirements, costs and locations. Some of the camps participating include: Princeton University Sports Camps, ESF Summer Camps, Princeton University Summer Day Camp, Rambling Pines Day Camp and the Princeton School of Rock. The event is sponsored by the Princeton Office of Human Resources. Contact Elaine Richards at 609-258-9109, [erichard@princeton.edu](mailto:erichard@princeton.edu) with questions. 📍



## Next steps

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programs have brought worldwide researchers together to discuss common challenges in annual workshops that the International Atomic Energy Agency began sponsoring last year. “The scientific and technical issues for fusion are well known,” said Neilson, “but the search for solutions is extremely challenging.”

The key issues entail developing an understanding of and solutions for:

- Plasma confinement and control.
- Plasma power exhaust.
- Power extraction and tritium self-sufficiency.
- High availability for generating electricity.

Individual countries are exploring their own paths to a DEMO, based on their perceived need for such energy. All such plans remain tentative and subject to government approval.

A look at the possible roadmaps that countries are considering:

- China—The world’s most populous nation is pushing ahead with plans for a device called China’s Fusion Engineering Test Reactor (CFETR) that would develop the technology for a demonstration fusion power plant. Construction of the CFETR could start around 2020 and be followed by operation of a DEMO in the 2030s.
- Europe and Japan—These programs are jointly building a powerful tokamak called JT-60SA in Naka, Japan, as a complement to ITER. Plans call for construction to be completed in 2019. The Japanese and Europeans will then pursue similar but

independent timelines. Both could start engineering design work on a DEMO around 2030, following the achievement of ITER milestones, and placing the DEMO in operation in the 2030s.

- India—The country could begin building a device called SST-2 to develop components for a DEMO around 2027. India could start construction of a DEMO in 2037.
- Korea—The program plans to build a machine that it calls K-DEMO that would develop components in the first phase, called K-DEMO-1, and utilize the components in the second phase, or K-DEMO 2. Construction could commence in the mid-to-late 2020s, with operations starting in the mid-2030s.
- Russia—The country plans to develop a fusion neutron source (FNS), a facility that would produce neutrons, the chief form of energy created by fusion reactions, in preparation for a DEMO. The FNS project is part of a Russian commercial development strategy that runs to 2050.
- United States—A next-step Fusion Nuclear Science Facility (FNSF) is under consideration. It would be used to investigate materials properties under fusion conditions, and develop components for a DEMO. Construction of the FNSF could start in the 2020s.

Neilson concluded his talk by noting, “There are multiple approaches to fusion development but broad agreement on the goals, critical tasks and value of international collaboration.” ☐

## Volunteers needed for Young Women’s Conference

**T**his year, 375 young women will take part in PPPL’s annual Young Women’s Conference in Science, Mathematics, Technology and Engineering at Princeton University on March 22 from 9 a.m. to 2 p.m. Conference organizers rely on the help of numerous volunteers to make the event run smoothly.

“I think it’s just an amazing opportunity to expose young women who are interested in science to all the opportunities that are out there,” said Aliya Merali, the program’s director. “What we do is try to highlight science in fields they may not be exposed to.”



Virginia Finley (right), head of environmental compliance at PPPL, volunteered at last year’s Women’s Conference.

In an email message to PPPL staff, Adam Cohen, deputy director for operations, noted that the conference is a “wonderful, well-attended event,” and PPPL is “proud to host it.”

The conference needs dozens of volunteers to help with exhibits, lead groups and help things move along smoothly. Please note that both female and male volunteers are welcome. Contact Aliya Merali, [amerali@pppl.gov](mailto:amerali@pppl.gov), ext. 2208 for more information.

Here is a list of the volunteer needs for the day:

- 10 group leaders
- 4-5 registration table volunteers
- 9-12 laboratory tours escorts
- 4 lunch crew volunteers
- 5 morning bus flow helpers & 5 afternoon bus flow helpers before and after the conference
- 3 traffic flow directors
- 3 exhibitor assistants

The morning portion of the conference will take place in the Frick Chemistry Laboratory and the afternoon portion of the conference will take place at McCosh Health Center with a shuttle bus leaving hourly from PPPL with a drop-off near Frick. Another shuttle for volunteers guests of employees taking part in the conference will leave PPPL early in the morning and after the conference ends. ☐

## A Pleasing Disruption: Fusion equations pop up on popular TV show

Greg Hammett, a physicist at the Princeton Plasma Physics Laboratory, was minding his own business one recent evening, chilling, watching a TV show popular with Lab folks and many others – the top-rated CBS comedy, “The Big Bang Theory” (Episode 14, titled “The Cooper-Kripke Inversion”). Suddenly he saw it: Jim Parsons, the actor playing one of the show’s lead characters – a brilliant, though socially awkward theoretical physicist named Sheldon Cooper – was at work in front of a whiteboard. Scrawled across the board in red-orange magic marker were letters and digits representing an idea that Hammett knew quite well. To his great pleasure, Hammett spied an equation he had helped derive in his research on fusion energy. “This equation describes turbulent diffusion in fusion devices and also describes how performance can be improved by sheared flows that can reduce the turbulence,” Hammett said. “The ovals at the bottom of Sheldon’s whiteboard are meant to illustrate this stabilization mechanism – which we are studying as a possible way to improve fusion reactors – and this is an illustration that I’ve used in my talks.”



Greg Hammett

Many researchers in the field of plasma physics have contributed to the development of this theory, fondly known to its adherents as “gyrokinetic turbulence theory.” The key people who developed this particular equation as well as the computer simulations backing them, in addition to Hammett, include: Bill Dorland at the University of Maryland; Mike Kotschenreuther, University of Texas; Mike Beer, Johns Hopkins University; and Ron Waltz of General Atomics. Dorland and Beer were former PhD students who worked with Hammett. Kotschenreuther also earned his doctoral degree from PPPL. And Hamid Biglari, who also played a significant role in the development of the turbu-

lence improvement mechanism in this equation, earned his PhD from PPPL. He is now enjoying a prominent career on Wall Street.

For Hammett, and other fans of “The Big Bang Theory” at the Lab, it was a thrill to see fusion science touched upon in the show, which often intertwines high-level scientific conversations on topics such as Einstein’s quest for a unified field theory with young adult obsessions such as finding an attractive date for a Saturday night.

Another important Princeton connection is the show’s science writer-consultant, David Saltzberg, a UCLA physicist and Princeton University graduate who ensures that the show’s scientific content – including all equations -- is accurate.

He obviously is very well read!

Hammett isn’t sure exactly where Saltzberg found the formulas and illustrations because they have appeared in many talks he and others have given over the years that are available online, such as a talk Hammett gave in 2005 at the Kavli Institute for Theoretical Physics in Santa Barbara.

But Hammett is thinking broadly, looking to see whether the fusion strand will be woven into future installments. Late in this episode, the character Sheldon speaks with a colleague about ideas for a new fusion reactor design. He starts to explain an approach for reducing turbulence, one of the major research issues for plasma physicists at the moment, but is interrupted. “I don’t know if we’ll ever learn what brilliant ideas Sheldon had,” Hammett said.

We can always hope! 🍷

**THE PPPL BLOG: <http://ppplab.blogspot.com/>**

## PPPL Annual “Green Machine” Awards

PPPL will celebrate Earth Day on Thursday, April 18, with guest speakers, displays and activities for employees, and presentation of the annual PPPL Green Machine Awards. Please submit award nominations for PPPL employees or employee teams that have contributed to PPPL’s environmental performance during the past year by:

- Reducing greenhouse gas emissions
- Saving energy
- Saving water
- Reusing equipment or material
- Recycling materials or equipment
- Reducing the use of toxic or hazardous materials
- Sustainable acquisition (purchasing recycled content, biobased, and other “green” products)
- Reducing or eliminating pollution, or
- Other actions which help protect public health or the environment

Nominations should include:

Nominee name(s)

PPPL work group

Description of the actions taken, and

Estimated cost savings or environmental benefit

Please contact Margaret King ([mking@pppl.gov](mailto:mking@pppl.gov)) or Leanna Meyer ([lmeyer@pppl.gov](mailto:lmeyer@pppl.gov)) if you have questions or would like information about past Green Machine awards. Nominations are due by Friday, March 15, by email to Virginia Finley ([vfinley@pppl.gov](mailto:vfinley@pppl.gov))

Thank you,  
PPPL’s Earth Day Team



## Memorial service and calling hours for JOHN SCHMIDT

A memorial service for John Schmidt, who died on Feb. 13, is scheduled for Saturday, March 9, at 11 a.m. in Nassau Presbyterian Church, 61 Nassau St., Princeton, N.J.

Calling hours will be Thursday, March 7, from 4 to 8 p.m. in the family home at 11 Catbriar Court, Belle Mead, N.J.



# COLLOQUIUM



**Unique Vulnerability of the NY/NJ Metro Region to Hurricane Destruction - A New Perspective Based on Recent Research on Irene 2011 and Sandy 2012**

**NICHOLAS K. COCH**  
Queens College CUNY

**SPECIAL DAY • Thursday, February 28 • SPECIAL TIME**

**4:15 p.m.** (Coffee/Tea at 4 p.m.)  
M.B.G Auditorium, Lyman Spitzer Building

## 2013 Science on Saturday

Princeton University Plasma Physics Laboratory Lecture Series



**Light and nanotechnology - engineering and so much more**

**CLAIRE GMACHL**  
Princeton University

Saturday, March 2 • 9:30 a.m. • M.B.G. Auditorium



**A short history of length**

**JOEL LANGER**  
Case Western Reserve University

Saturday, March 9 • 9:30 a.m. • M.B.G. Auditorium



**A robot's view of our ocean planet**

**JOSH KOHUT**  
Rutgers University

Saturday, March 16 • 9:30 a.m. • M.B.G. Auditorium

## Plasma Hutch is open

Kim Mastromarino, left, displays some of the items for sale at the Plasma Hutch, including a new long-sleeved fleece jacket. The Plasma Hutch is open on Fridays from 11:30 a.m. to noon. You can also pick up an order form or download one from the HR website at [hr.pppl.gov](http://hr.pppl.gov) and send it via email to Kim at [kmastrom@pppl.gov](mailto:kmastrom@pppl.gov).



### PLASMA HUTCH Price List

	S-XL	2X-3X
☉ Fleece Vest.....	\$30	\$32
☉ Polo Shirt.....	\$20	\$24
☉ Fleece Jacket.....	\$35	\$37
☉ Zippered Sweatshirt (Hooded) ...	\$32	
☉ Pullover Sweatshirt (Hooded) .....	\$28	
☉ Crew Sweatshirts.....	\$20	
☉ Long Sleeve T-Shirts.....	\$15	
☉ T-Shirt .....	\$12	
☉ Hat.....	\$12	
☉ Travel Mug.....	\$10	
☉ Ceramic Mug.....	\$7	
☉ Tumbler.....	\$5	
☉ Lanyard.....	\$3	
☉ Pen.....	\$1	
☉ Ornament.....	\$1	

# 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

COMMAND PERFORMANCE  
CHEF'S FEATURE

**MONDAY FEB. 25**



**LINGUINE WITH CHICKEN**

**TUESDAY FEB. 26**



**BAKED POTATO BAR**

**WEDNESDAY FEB. 27**



**MOUSSAKA SERVED WITH GREEK SALAD**

**THURSDAY FEB. 28**



**BEEF STROGANOFF OVER EGG NOODLES**

**FRIDAY MAR. 1**



**PASTA PRIMAVERA WITH GARLIC BREAD**

EARLY RISER

Pumpkin Pancakes

Smothered Hash Browns

Ham & Cheddar Croissant

Banana Stuffed French Toast

Eggs Benedict

COUNTRY KETTLE

Chicken Noodle

Escarole & White Bean

Potato with Bacon & Cheddar

Split Pea with Ham

Lentil

GRILLE SPECIAL

BBQ Chicken Cheesesteak with Peppers, Onions & Fries

California Turkey Burger & Fries

Turkey Reuben on Rye served with Cole Slaw

Chicken Tender Hoagie with Fries

Chicken Tender Hoagie, Fries/ Fried Fish Sandwich with Fries

DELI SPECIAL

Liverwurst & Onion on Rye

Southwestern Chicken Salad Wrap

Prosciutto, Provolone & Salami Hoagie

Chicken, Goat Cheese, Sundried Tomatoes & Tarragon Mayo

Caprese Sandwich with Eggplant, Fresh Mozzarella & Basil

PANINI

Turkey, Bacon, American Cheese & Tomato Ciabatta

Chicken Breast, Fresh Mozzarella, Mayo & Tomato

Pulled Pork, Broccoli Rabe & Sharp Provolone Panini

Bacon, Cheddar & Pear Panini with Jam

Vegetarian Mexican Wrap

MENU SUBJECT TO CHANGE WITHOUT NOTICE

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

## WEEKLY

Editor: **Jeanne Jackson DeVoe** ♦ Layout and graphic design: **Gregory J. Czechowicz**  
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The PPPL WEEKLY is published by the PPPL Office of Communications on Mondays throughout the year except for holidays. Deadline for calendar item submissions is noon on Thursday. Other stories should be submitted no later than noon on Wednesday.

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