

At PPPL THIS WEEK

MON., NOV. 24

United Way Bake Sale
9:30 a.m. ♦ LSB Lobby



THU. - FRI., NOV. 27-28

Lab closed
Thanksgiving Holiday



UPCOMING EVENTS

December 3

PPPL Colloquium

4:15 p.m. ♦ MBG Auditorium

Advanced Simulation for Technology In-
novation and Science Discovery

Scott Stanton - ANSYS, Inc.

December 17

PPPL Colloquium

4:15 p.m. ♦ MBG Auditorium

Challenges of LTS and HTS Wire/Tape
R&D and Manufacturing

**Jeffrey Parrell - Oxford Instruments
Superconductivity Technology**

December 23

PPPL Holiday Luncheon

Noon ♦ LSB Lobby and Café



December 24-Jan. 2

Lab Closed - Holidays

January 14, 2015

**PPPL's Records/
Paper Shredding Event**

9 a.m. - 4 p.m. ♦ Receiving 3



Inside...



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Café Menu

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Team led by PPPL's Chang receives DOE 2015 INCITE award totaling 270 million core hours to study key problem in fusion

By Jeanne Jackson DeVoe

The U.S. Department of Energy has bestowed many hours of access to scientists at the Center for Edge Physics Simulation (EPSI), led by C.S. Chang, a physicist at PPPL. The highly competitive award allows 270 million core hours on two powerful supercomputers that will enable researchers to continue staging complex simulations of how charged particles behave in the tokamak edge. The award was the second highest in the INCITE program.

Officials representing the DOE's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program announced the awards to EPSI along with 55 other cutting-edge research projects in the U.S. The scientists will share a total of 5.8 billion core hours on the two fastest computers in the U.S.

INCITE will give the EPSI team 170 million core hours on Titan, the Cray XK7 supercomputer at Oak Ridge National Laboratory. It is the world's second-largest computer and can do over 20 quadrillion (one thousand million million) calculations per second. The program also gave EPSI 100 million core hours on Mira,



C.S. Chang

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Rob Goldston, Alex Glaser and Boaz Barak named among Foreign Policy magazine's 100 top global thinkers

By John Greenwald

Editors of *Foreign Policy* magazine have named fusion physicist Rob Goldston, a Princeton University professor of astrophysical sciences and former director of PPPL, to its list of "100 Leading Global Thinkers of 2014." The recognition, made Nov. 17 at a celebration in Washington, D.C., honored Goldston for his contributions to the field of nuclear arms control.

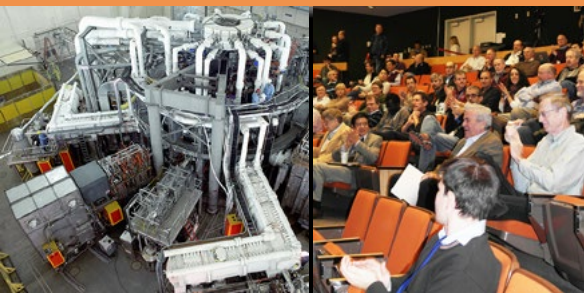
Founded in 1970, *Foreign Policy* magazine focuses on global affairs, current events and domestic and international affairs. It produces daily content on its website, *ForeignPolicy.com* and publishes six print issues annually.



From left, innovators Boaz Barak, Alex Glaser and Rob Goldston.

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Photo: Foreign Policy Magazine



PPPL Celebrates 20th Anniversary of 10 MW of Fusion Power on TFTR

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Supercomputers

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an IBM Blue Gene/Q computer at Argonne National Laboratory, which can perform 10 quadrillion calculations per second. One day on Mira is equivalent to what the average person could accomplish in 20,000 years on a personal computer.

The award is the third in a three-year grant from INCITE. EPSI received 229 million core hours last year and 100 million core hours two years ago.

Understanding and controlling the edge of a plasma produced during experiments is a crucial issue in producing fusion energy in ITER, the international fusion experiment being constructed in Cadarache, France. The EPSI team built the edge gyrokinetic code XGC for this purpose.

The award will allow the EPSI team of physicists, mathematicians and computer scientists from 10 different institutions and PPPL to use the XGC code to study how charged particles generate turbulence and how the turbulence affects the charged particles.

Turbulence at the edge is nonlinear and intermittent, meaning it is high-density and “blobby,” Chang said. Charged particles bunch together at the edge and carry particles and energy away with them toward the material wall. This leads to a loss of mass and energy in the core of the plasma where extremely high heat of 100 million degrees Centigrade is needed to maintain the fusion reaction.

Chang believes the “blobby” turbulence is the most common type of turbulence at the edge of the plasma, as seen in the experiment for a long time. “We are studying how they are born and how they move around and how they die, how they carry mass and energy away from the plasma to the wall,” Chang said.


The additional time will be used to simulate how the blobby turbulence at the edge of the plasma will behave with electromagnetic fluctuations in ITER, Chang said. The simulations will also study how the “blobby” turbulence will affect the tokamak’s divertor. The divertor is composed of metal plates made of tungsten at the base

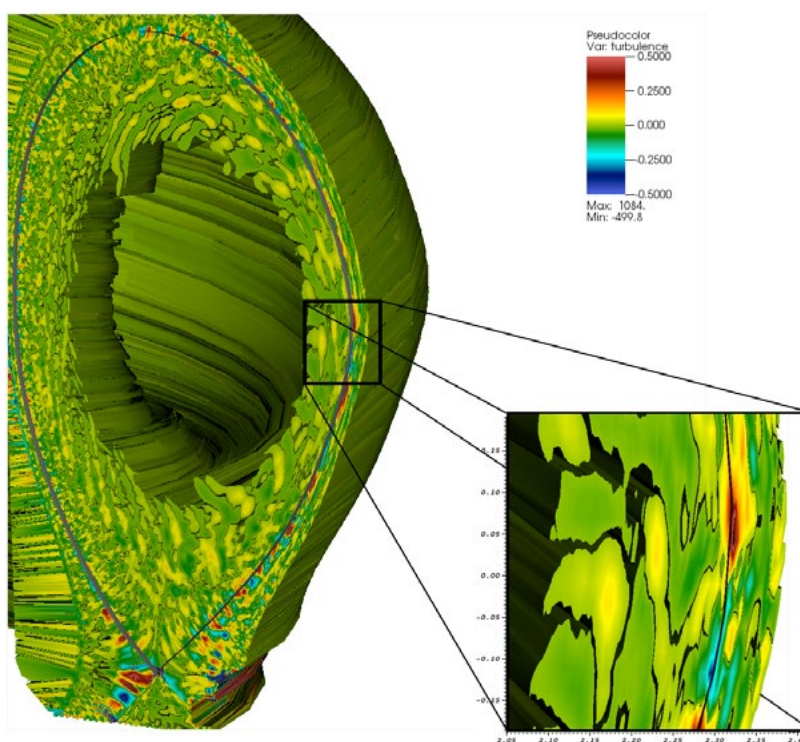
of the tokamak that take heat and helium ash from the plasma to keep the core plasma stable and maintain the plasma reaction. The super-hot plasma can cause damage to the divertor plates if the heat load is not adequately distributed.

PPPL physicist Stewart Zweben, among others, first observed the “blobby” turbulence in edge plasmas in fusion experiments well over a decade ago, Chang said. Past studies used model equations but they were too simple to fully capture the physics of blobs. Researchers needed powerful computers to use a process called “gyrokinetic simulation,” that solves the complex kinetic interactions of the charged particles at the plasma’s edge.

With such an ambitious research agenda and the complex computer code, researchers could quickly use up the 270 million core hours, Chang said. He estimates that the XGC simulations would take about 10 million core hours in a full day, giving the EPSI team a total of approximately 17 full days on Titan and 10 full days on Mira. This amounts to fewer than three ITER physics studies if the full complexity of the XGC code is to be engaged, Chang said. For a routine ITER physics simulation, Chang said he will have to wait for more powerful computers. Such computers are expected to be operational in a few years at Oak Ridge National Laboratory, Argonne National Laboratory and the National Energy Research Scientific Computing Center at the Lawrence Berkeley National Laboratory and others.

PPPL physicists working on the simulations include Seung-Hoe Ku, Jianying Lang, Robert Hager, Daren Stotler, Stephane Ethier, Salomon Janhunen, and Michael Churchill.

Other national laboratories and universities working with the Center for Edge Physics Simulation include: Oak Ridge National Laboratory, MIT, Rutgers University, Lehigh University, the University of Colorado, the University of California at San Diego, the University of California, Irvine, the Lawrence Berkeley National Laboratory, Rensselaer Polytechnic Institute, and the University of Texas at Austin. Collaboration with these team members is invaluable, Chang said. 



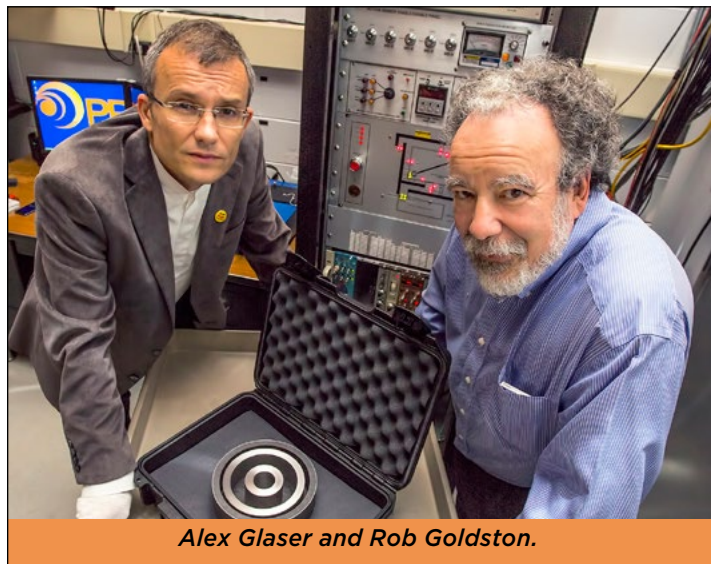
The EPSI team produced this simulation of highly varied “blobby” turbulence at the edge of a tokamak plasma using a complex code called gyrokinetic code XGCI on the fastest computers in the U.S.

Simulation by S. Ku, PPPL, and image by D. Pugmire, ORNL.

Global Thinkers

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Named with Goldston were Princeton physicist Alex Glaser and Boaz Barak of Microsoft Research New England. The researchers have designed a novel process called a “zero-knowledge protocol” for verifying that nuclear weapons to be dismantled or removed from deployment contain true warheads. Goldston and Glaser are developing a prototype system at PPPL that will test the idea by



Alex Glaser and Rob Goldston.

beaming neutrons at a non-nuclear test object.

The zero-knowledge concept, which would achieve verification without collecting any classified information that could lead to nuclear proliferation, aroused worldwide interest last June when Nature magazine published a paper by the researchers about the process. Reporting on the paper’s reception, Science magazine wrote that the piece was “setting the arms-control community abuzz.”



Boaz Barak

Goldston said he hoped the Foreign Policy recognition for an approach to arms control that carries no risk of spreading classified information “would help to encourage policy makers to keep pushing this agenda.” Glaser expressed a similar sentiment. “It is fantastic to see that new ideas in the area of nuclear arms control can get the attention of the broader policy community,” he said. While “real progress” has been made in reducing the global stockpile of nuclear weapons since the Cold War, he added, “much more needs to and can be done.”

PPPL kicks off United Way campaign

GIVE. ADVOCATE. VOLUNTEER.
LIVE UNITED 

Herb Klein, the president and CEO of United Way of Greater Mercer County, told PPPLers that the organization is changing people’s lives and benefitting the economy of the county through numerous programs for senior citizens, poor and middle-income residents, the homeless, young people and others.

“Our objective is to change people’s lives for the better,” he said at the Nov. 19 kick-off event for PPPL’s United Way campaign.

Himanchi Sachdeva, a college student in Mercer County, said the organization helped her with financial aid to enable her to go to college without getting into debt. “United Way has helped me so much, not only with financial aid but just by being there,” she said.

PPPL’s United Way campaign will also include a bake sale on Monday, Nov. 24 at 9:30 a.m.

United Way donations can be mailed to Princeton University or given to Kate Harkness in Human Resources, ext. 2223.



Some of the PPPL volunteers who organized the kick-off with United Way representatives. From left to right: Kate Harkness, Carol Ann Austin, Himanchi Sachdeva, who spoke about how United Way helped her go to college, Sandra Toussaint-Burgher, vice-president of resource development at United Way, Herb Klein, president & CEO of United Way of Greater Mercer County, Rich Torraca, and Marianne Tyrrell. Not shown are Ashwini Borkar, Jeanne Jackson DeVoe and Julia Toth.

PPPL TRAVEL TIPS

Travel Paid by Others

When another organization or entity pays for travel expenses, the PPPL traveler must reduce the per diem appropriately. If the organization is reimbursing all or a portion of the costs associated with a business trip, then one of the following two procedures must be followed:

1. If all travel and reimbursements are administered by PPPL, the traveler must include an invitation letter, and note on the Travel Authorization form which expenses (if not all) will be covered by the organization or personally by the traveler. Reimbursable travel expenses may not be charged to a Laboratory

project account. The travel should indicate the expenses to be billed to the other organization on the travel voucher and provide contact information for the organization.

2. Endorse over to PPPL any funds provided directly to the traveler by the other organization. If all travel and reimbursements are administered by the other organization, the traveler must repay any travel advances or direct payments issued by PPPL. If the reimbursement does not cover the total expenses claimed on the Travel Voucher PPPL will charge the difference to the other organization. If the reimbursement exceeds the covered expenses PPPL will credit the Division for any difference and deposit the funds into the PPPL account.

PPPL Celebrates 20th anniversary of 10 MW of Fusion Power on TFTR

PPPL celebrated the 20th anniversary of the Tokamak Fusion Test Reactor (TFTR) achieving a world-record 10.7 million watts of controlled fusion power on Nov. 2, 1994, with cake, ice cream and a colloquium on Nov. 18.

Rich Hawryluk, who was head of TFTR from 1991 to 1997, recalled that the original goal was to get to five megawatts but DOE officials told them the goal should be double that number. "It was only achieved by a Laboratory-wide effort. Everyone who was part of the Laboratory all pulled together as a unified team," he said. "This was a fantastic achievement."

Physicist Michael Bell gave a colloquium on the anniversary in which he recalled the exciting and nerve-racking journey to that world record. The research accomplished on TFTR has paved the way for future fusion programs including NSTX-U and ITER, the in-

ternational fusion experiment in Cadarache, France, he said. He quoted Russian researcher Sergei Minov about how the impact of the achievement on future fusion programs was not fully recognized. "Not everyone understood this at the time but such is the fate of great deeds," he said.



◀ Dale Meade, right, who was deputy director of the Lab during the world record, with Philip Efthimion, head of Plasma Science and Technology.



Rich Hawryluk, who was head of TFTR from 1991 to 1997, at the 20th anniversary celebration of the Nov. 2 world record and (top inset) at the 1994 celebration.



▶ Bob Woolley, left, with Larry Grisham at the party.



Ice cream servers from left: Rich Torraca, Rosemarie Fuchs-Smith and Julia Toth.



Luis Delgado-Aparicio, left, with Kathleen Lukazik, and Brent Stratton, enjoys some cake.



Atiba Brereton, left, and Danny Cai at the celebration.

Photos by: Jeanne Jackson DeVoe



I am the Lab



Nearly everyone at the Lab with a computer has met Lena Scimeca, a computer account administrator in the Information Technology Department. Part of her job is to help new employees get email accounts. Scimeca, who has been at the Lab for 38 years, says she enjoys helping people with their accounts at PPPL and all over the world. But even PPPL'ers who haven't met Scimeca are probably familiar with the white board outside her first-floor office in the Lyman Spitzer Building where she posts a new joke or funny saying every day. She and her husband Carl, who works in PPPL's Video Conferencing Services department, have been married for 37 years and have two grown children. Lena started at PPPL in 1976 and Carl followed the next year. They can be seen eating lunch together in the cafeteria every day.

Name:

Lena Scimeca

What is your position at PPPL?

Computer account administrator.

What department are you in?

The Information Technology Department.

Please briefly describe your job.

I have been the computer account administrator for almost the entire time I've worked at PPPL. I handle the distribution and replacements of SecurID Tokens for access to PPPL resources from off-site (no matter where the user is). I also handle the renewal of over 60 software contracts for the ITD and CAD groups. The creation of mail lists and groups also gets funneled through my office.

How long have you been at PPPL?

I've been at the lab since October 1976.

What is the most fun or rewarding thing about your job?

I'd have to say the most fun or rewarding facet of my job is interacting with all the different people who request computer accounts both on site and off. You get to experience different cultures without ever leaving your office. I've had the opportunity to work with lots of different people over the years from all over the world.

Can you discuss your famous jokes on the whiteboard outside your office?

My board started out as a status board. I started finding little comments on my board. After a while, I just started writing silly sayings on my board and it just caught on! People go out of their way to go by my board to see what I've written for the day. I've even had visitors ask me to send them my sayings after they've left the Lab.

If the sayings aren't updated regularly, people are disappointed and let me know about it. They also seem to remember if I've written the saying before. I've got a real tough crowd out there!

Where do you get your material?

I get my material from many different sources. I Google one-liners. I get inspiration from T-shirts and sweatshirts. I also have members of the Lab sending me material they think would be good for the board. You'd be amazed at how you start to look at things differently when you're looking for inspirations or when inspiration finds you. You read something and the first thing that pops into your mind is, "That would be good for my board!"

What kind of comments do you get?

I get a kick out of hearing people's responses as they go by my office. I hear everything from little snickers to hearty laughter to gut wrenching groans.

Do you have an all-time favorite joke?

My favorite jokes and sayings change all the time. Currently I would have to say:

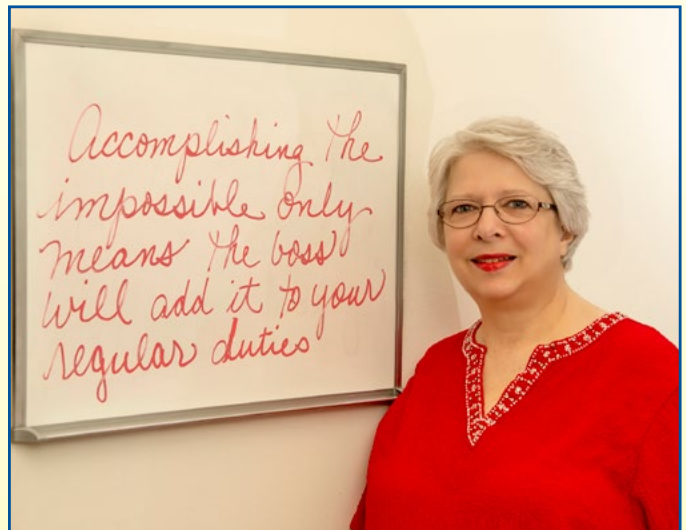
Change is inevitable except from a vending machine.

Don't make me put my hands on my hips!

Note to Self: Just because it pops into my head doesn't mean it should come out of my mouth.

What was your most memorable experience at PPPL?

I really don't have a favorite or memorable experience at PPPL. I've gotten to work with many different and talented people on a variety of different experiments. I was a computer operator in the days of PLT and PBX. Then there was TFTR and of course NSTX and now NSTX-U. Just being a small part of this has been very exciting!



Where do you live?

Carl and I live in Cream Ridge, New Jersey. We've been there since a year after we got married in 1977.

What would you like to tell us about your family?

I think everyone knows my husband Carl since he handles video conferencing here at PPPL. We met at a previous job where I was Carl's supervisor (I just love saying that! It was the last time I was in charge).

We have two grown daughters, Jennifer, who works for Tiffany's Corporate Offices in Parsippany, New Jersey, and Laura, who is a teacher in Virginia Beach, Virginia.

What is it like working at the same place as your husband Carl?

I trained him when he got here but he then moved to the GPC (General Purpose Computer Room, now known as the PPLCC), so it gave us some breathing space. When he first started working here, we shared an office as well as working together.

Having lunch together every day is nice because we both work different hours and have different activities after work, and because of this we don't get to have dinner together regularly.

It's also a plus having a shared knowledge of coworkers. So when we mention this one or that one, we both know who the other one is talking about. We've been working together for so long, I don't remember what BC (before Carl) is any more.

What do you like to do when you're not at work?

I think the thing I like to do the most is read. I enjoy reading fiction. I also love to watch old movies on the Hallmark and TCM channels. I especially like musicals and romantic comedies.

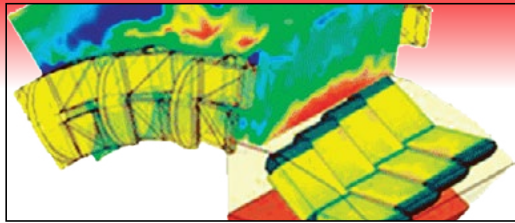
What do you tell your friends and family about PPPL?

I have spent roughly two-thirds of my life here at PPPL. It's been fun to watch the Lab go through its many changes over the years. It's like we grew up together.

What is one thing you'd like PPPL'ers to know about you or your job?

My job is very diverse, demanding and a challenge but it also allows me to know just about everybody that works at PPPL.

COLLOQUIUM



Advanced Simulation for Technology Innovation and Science Discovery

Scott Stanton
ANSYS, Inc.

Wednesday, December 3

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

Don't forget to switch to CrashPlan PROe by Dec. 1

Dec. 1 is the deadline to switch to CrashPlan PROe by contacting the Help Desk (Call ext. 2275 or submit a ticket).

The new cloud-based system has several advantages:

- Users can back up their computer from anywhere with an active Internet connection.
- Users can access their data from any system with a modern web browser.
- After the system is installed, users can view their data on their smart devices by downloading the mobile app.



BROCK Café 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

	MON. 24 NOV.	TUE. 25 NOV.	WED. 26 NOV.	THU. 27 NOV.	FRI. 28 NOV.
	Chicken-Fried Chicken with Mashed Potatoes, Spinach & Country Gravy	Carved Pork with Herb Stuffing and Vegetable	Potato Cheese Pierogies with Sour Cream & Onions and Vegetable		HAPPY THANKSGIVING!
EARLY RISER	Blueberry Pancakes with Sausage	Western Omelet with Home Fries	Chicken, Spinach, Mushroom, Cheese Omelet with Home Fries		
COUNTRY KETTLE	Cream of Vegetable	Tomato Basil Bisque	Chicken Noodle Soup		
GRILLE SPECIAL	The Works-Beef Cheesesteak	Grilled Cheese with Ham & Tomato	Fish Cake Po' Boy Torpedo served with French Fries		
DELI SPECIAL	Veggie Antipasto Wrap with Assorted Cheeses & Vegetables	Liverwurst & Onion on Rye with Mustard	New Orleans Mufuletta		
PANINI	Salami, Ham, Provolone Cheese, Banana Peppers on Ciabatta Bread	Tuna, Swiss, Tomato & Bacon Wrap	Turkey, Bacon & Swiss Wrap		

COMMAND PERFORMANCE
CHEF'S FEATURE

	MON. 1 DEC.	TUE. 2 DEC.	WED. 3 DEC.	THU. 4 DEC.	FRI. 5 DEC.
	Ota Ya Sushi	Green Pepper Steak served over Rice	Home-style Meatloaf with Mac & Cheese & Stewed Tomatoes	Create Your Own Pasta	English-Style Fish And Chips
EARLY RISER	Blueberries & Cream French Toast	Apple Pancakes served with Homemade Turkey Sausage	Grilled English Muffin with Peanut Butter, Honey & Banana	Hearty Chicken, Apple & Kale Breakfast Strata	Vegetable Egg White Omelet served with Potatoes
COUNTRY KETTLE	Beef Rice	Potato Leek with Mushroom	Spicy Louisiana Seafood Chowder	Tomato with Spinach & Lentils	Navy Bean with Ham
GRILLE SPECIAL	Meatball Parmesan Torpedo	Andouille Sausage Torpedo with Peppers & Onions	Mozzarella Sticks with Marinara Sauce & French Fries or Side Salad	BBQ Blue Turkey Burger served with Onion Rings	Fried Potato Cheese Pierogies
DELI SPECIAL	Veggie Burger Parmesan on a Kaiser Roll	Roast Beef with Blue Cheese, Arugula & Tomato on a Wheat Roll	Bologna & American Cheese on White with Lettuce & Tomato	Seafood Salad Platter	Chicken Salad Club Sandwich
PANINI	Buffalo Chicken over Mixed Greens	Classic Vegetable Reuben on Multigrain Bread	Chicken Pot Pie with Puff Pastry	Eggplant, Portobello Mushroom, Tomato on a Whole Grain Roll	Meatloaf Sandwich with Cheddar Cheese, Lettuce & Tomato

MENU SUBJECT TO CHANGE WITHOUT NOTICE

VEGETARIAN OPTION

CLICK HERE FOR A PRINTABLE WEEKLY MENU

WEEKLY

Editor: **Jeanne Jackson DeVoe** ♦ Layout and graphic design: **Gregory J. Czechowicz**
Photography: **Elle Starkman** ♦ Science Editor: **John Greenwald** ♦ Webmaster: **Chris Cane**

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 WEDNESDAY. Other stories should be submitted no later than noon on TUESDAY.

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

NOTE: Due to the Thanksgiving holiday the PPPL WEEKLY will not be published on **Dec. 1.**