

## At PPPL THIS WEEK

### UPCOMING EVENTS

July 24

**Tour Guide Training Meeting**  
10 a.m. ♦ MBG Auditorium

Followed by tour for tour guides

August 8

**Annual PPPL Bluefishing Trip**  
5 p.m. ♦ Belmar Marina

Aboard the 80' Suzie Girl

Reserve by July 25



August 13

**Poster Session for Summer Students**  
10 a.m. ♦ LSB Lobby

## Princeton-PPPL paper sets arms-control community abuzz

By John Greenwald

**M**ore than 40 websites around the world have cited a novel method to facilitate nuclear disarmament that scientists at Princeton University and PPPL published last month in a paper in *Nature* magazine. The paper “is setting the arms-control community abuzz,” wrote *Science* magazine in an article about the piece.

The paper, titled “A zero-knowledge protocol for nuclear warhead verification,” outlined a system being developed at Princeton University and PPPL to verify that nuclear weapons to be dismantled or removed from deployment contain true warheads. The process would accomplish this while safeguarding classified information that could lead to nuclear proliferation.

The protocol is the creation of Princeton physicists Alexander Glaser and Robert Goldston, a fusion researcher and former director of PPPL, and Boaz Barack of Microsoft New England. Their system would compare a warhead to be inspect-



continued on page 2

## Tour guides wanted! Tour training on July 24

If you're a staff member or graduate student with a good background in engineering or physics, please consider volunteering to be a tour guide. More tour guides are needed to accommodate the numerous tours coming to PPPL. There are also plans to offer twice-monthly tours for the public starting in September. Anyone interested in becoming a tour guide should contact Jeanne Jackson DeVoe, [jjackson@pppl.gov](mailto:jjackson@pppl.gov).

Experienced tour guides are being asked to fill out a [tour survey](#) in which they can give their ideas on how to improve the tour program and list their main talking points at each of PPPL's major tour sites.

A tour guide meeting and training session will be held on July 24 at 10 a.m. in the MBG Auditorium. There will be a presentation by Science Education's Shannon Greco on how to discuss complex science topics with a non-science audience. There will also be a discussion of the main talking points at various tour sites based partly on the tour guide survey. There will be a “tour for tour guides” at 2 p.m. given by veteran tour guides. New and experienced tour guides are strongly encouraged to attend.

A tour advisory group comprised of veteran tour guides Al Von Halle, Charles Gentile and Ray Camp, newcomer Nathan Allen, as well as Arturo Dominguez and Shannon Greco, from Science Education; Jeanne Jackson De-

Voe, from the Office of Communications; Michael Gonzalez, from Human Resources; Eliot Feibush, and graduate students Eugene Evans, and Leland Ellison have been working on developing information for the training.

“One of our goals is to make our tour guides aware of the different preconceptions of audiences at different educational levels,” said Greco. “Research has a lot to offer as far as ways of presenting information that will contribute to a deeper understanding of a topic.”



Andrew Zwicker, head of Science Education, shows visitors a DC discharge plasma machine in the LSB lobby during a Freshman Families Weekend tour last October.



Arms control

continued from page 1

ed with a known true warhead by beaming neutrons through each one to see if detectors behind the weapons showed matching results. No classified data would be measured in this process, which would measure only the difference between the two signals, and no electronic components that might be vulnerable to tampering and snooping would be used.

The project under construction at PPPL would use a non-nuclear target to test this approach. The project was launched with a grant from The Simons Foundation delivered to Princeton through Global Zero, a nonprofit organization. Additional funding has come from the U.S. Department of State, the Department of Energy, and most recently, a total of about \$4 million over five years from the National Nuclear Security Administration, when the Yale University group that will be developing the specialized neutron detectors is included.

Online coverage of the Nature paper has ranged from scientific publications to major newspapers such as the Los Angeles Times and the Chicago Tribune. “What I found great was that sites like Wired and The Verge [which covers the intersection of technology, science, art and culture] found arms control sufficiently interesting to write about for a younger audience,” said Glaser, first author of the Nature paper, which Goldston and Barak cowrote. The extensive coverage heartened Goldston as well. “To me, the most important thing would be if this causes people to think that arms reduction may be possible, down to low numbers of weapons, and this may lead to leaders taking on that challenge,” Goldston said.

Experts who commented on the protocol called it a promising one. “There are problems to be addressed before such a protocol can be implemented,” physicist John Finney of University College London wrote in the “News & Views” section of the Nature issue last month. “But as long as such problems can be overcome this brilliant idea could solve one of the really messy issues that we will have to deal with when we finally agree to rid ourselves of these weapons.”

Richard Garwin, a weapons expert who helped design the first hydrogen bomb, called the protocol “a useful invention,” but warned that a host nation might still find ways to cheat. Garwin suggested adding a second set of detectors to further protect against fraud. “We’re looking into that,” Goldston said.

He and Glaser expect the PPPL project to show first experimental results within a year. Meanwhile, they aim to stimulate thoughts among other scientists. The two physicists have papers this month at the annual meeting of the Institute of Nuclear Materials Management, which represents professionals engaged in safekeeping nuclear materials. Glaser also has created a page (<http://nuclear-futures.princeton.edu/warhead-verification/>) on the University’s Nuclear Futures Lab website to track the progress of the project and elicit comments. “We hope to have other people trying out these ideas,” Glaser said.

SPACE DAILY

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NUKE WARS

New technique calls nuclear blind-man's-bluff

by Staff Writers

Paris (AFP) June 25, 2014


Scientists in the United States claim to have

Los Angeles Times

Science Now

Discoveries from the world of science and medicine

Fusing physics, cryptography to solve a nuclear inspection paradox



The CHRISTIAN SCIENCE MONITOR

DC Decoder | Security Watch


World | USA | Commentary | Business | Energy / Environment | Innovation | Science | Culture

SCIENCE

New test could hint at nuclear weapons inspections of the future

How can nuclear weapons inspections determine if a warhead is real or fake without opening it up and giving away national secrets? Scientists have devised a test.

By Pete Spotts, Staff writer | JUNE 26, 2014



Robert Burns/AP/File | View Caption

THE VERGE

EMMYS

TRENDING NOW

Netflix scores Emmy nominations for 'Orange is the New Black,' 'House of Cards'

LONGFORM | VIDEO | REVIEWS | TECH | SCIENCE | CULTURE | DESIGN | BUSINESS | US & WORLD | FORUM

Researchers devise a zero-knowledge proof for nuke inspection


By Adrienne Jeffries on June 25, 2014 09:47 pm Email godjeffries

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W I R E D

Reinventing nuclear inspections with 'zero knowledge'

Above, some of the more than 40 websites from around the world that published articles about a novel method being developed at PPPL to detect nuclear arms.



# Experts assemble at PPPL to discuss mitigation of tokamak disruptions

By John Greenwald

Some 35 physicists from around the world gathered at PPPL last week for the second annual Laboratory-led workshop on improving ways to predict and mitigate disruptions in tokamaks. Avoiding or mitigating such disruptions, which occur when heat or electric current is suddenly reduced during fusion experiments, will be crucial for ITER, the international experiment under construction in France, to demonstrate the feasibility of fusion power.

Presentations at the three-day session, titled “Theory and Simulation of Disruptions Workshop,” focused on the development of models that can be validated by experiment. “This is a really urgent task for ITER,” said Amitava Bhattacharjee, who heads the PPPL Theory Department and organized the workshop. The United States is responsible for designing disruption mitigation systems for ITER, he noted, and faces a deadline of 2017.

Speakers at the workshop included theorists and experimentalists from the ITER Organization, PPPL, General Atomics and several U.S. universities, and from fusion facilities in the United Kingdom, China, Italy and India. Topics ranged from coping with the currents and forces that strike tokamak walls to suppressing runaway electrons that can be unleashed during experiments.

Bringing together theorists and experimentalists is essential for developing solutions to disruptions, Bhattacharjee said. “I already see that major fusion facilities in the United States, as well as international tokamaks, are embarking on experiments that are ideal validation tools for theory and simulation,” he said. “And it is very important that theory and simulation ideas that can be validated with experimental results are presented and discussed in detail in focused workshops such as this one.”



Amitava Bhattacharjee, left, and John Mandrekas, a program manager in the U.S. Department of Energy’s office of Fusion Energy Sciences.



Physicist Allen Boozer delivers a presentation.



Participants filled room B318 during the workshop.



# PPPL Welcomes New Employees!



**KEN BAUER**  
*Electrical CAD Designer  
Engineering*



**DANNY CAI**  
*Gas Systems Engineer  
Engineering*



**NAILA FIRDAUS**  
*Senior Program Analyst  
Information Technology*



**KATE HARKNESS**  
*Exec. Assistant/Specialist  
Human Resources*

## Site Protection Division • TIP • OF • THE • WEEK •

### EVACUATION PROCEDURES

To maximize the effectiveness of PPPL's evacuation procedures, all staff are reminded of the following:

If you see smoke or fire, or smell an odor:

- Contact the Emergency Services Communication Center at Ext. 3333 (609-243-3333 from a cell phone).
- Speak slowly and clearly.
- Provide as much pertinent fire or rescue information as possible to the Communications Officer including location, nature of emergency, your name, call-back number.

**IMPORTANT:** Wait for the Communications Officer to hang up first as he or she may need additional information from you or may provide additional instructions.

Upon completion of the emergency phone call, do the following (if not already done):

- Pull the nearest fire alarm pull-station.
- Evacuate the building.
- Report to your assigned evacuation area.
- Do not reenter the building until notified by emergency personnel.

Please locate the fire alarm pull-stations in your area.

Additional information on Building Evacuation Procedures may be found at <https://int-sweb.pppl.gov/siteprotection/buildingevacuation.html>.

### Annual PPPL Bluefishing Trip aboard the 80ft "Suzie Girl"

Friday, August 8, 2014 • Departure: 5pm SHARP!

Belmar Marina Hwy. 35, Belmar, NJ 07719

Cost: \$75 Per person • All inclusive

Money due by Friday July 25. NO REFUNDS.

Cost includes everything:

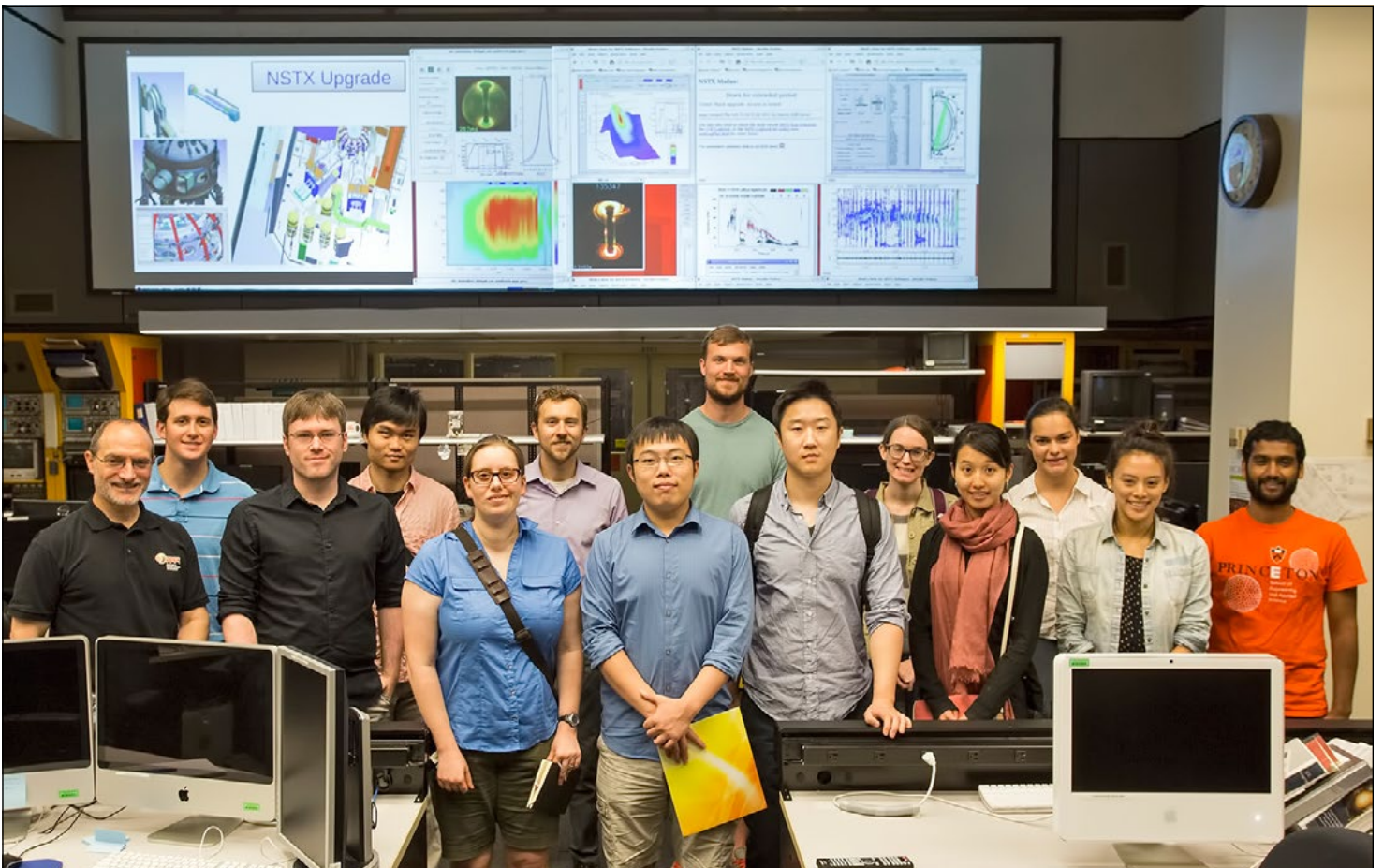
Rods, Bait, Fish Cleaning, Food, Beverages, Prizes etc.

All you need to do is show up!

Contact Andy Carpe ext. 2118 [acarpe@pppl.gov](mailto:acarpe@pppl.gov)

Bob Tucker Jr. ext. 3190 [rtucker@pppl.gov](mailto:rtucker@pppl.gov)

## Princeton Energy & Climate Scholars at PPPL



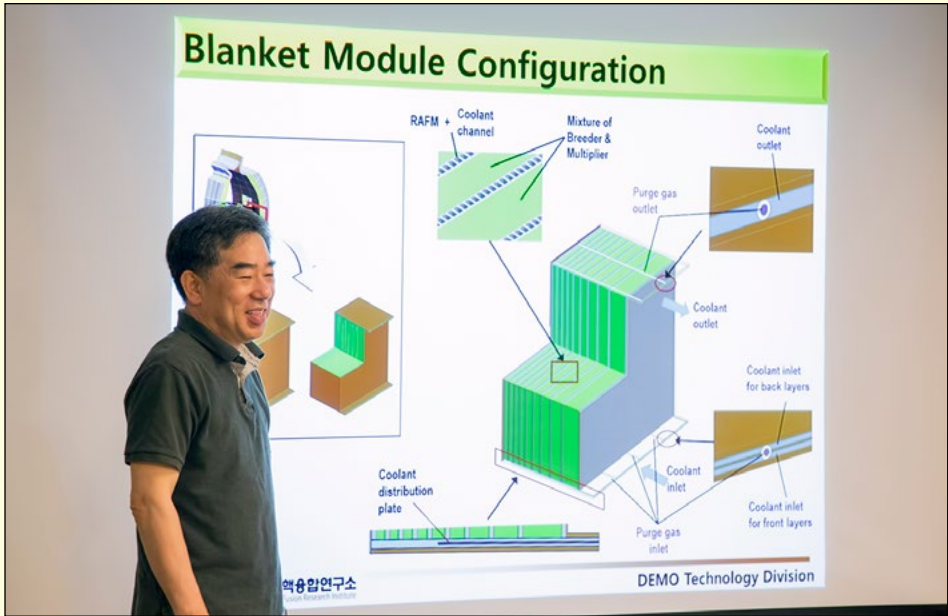
Some 13 Princeton Energy & Climate Scholars came to PPPL on June 27 as the first step in their yearlong study of fusion energy. The students are Princeton University graduate students who are in various energy-related fields that could include anything from engineering to public policy who work together through the Princeton Environmental Institute on a research paper or other projects. The group heard a presentation by Deputy Director for Operations Adam Cohen and spoke with Cohen and Andrew Zwicker, head of Science Education. After they ate lunch at PPPL, Cohen gave them a tour of the Lab.





# What's Happening @ PPPL?

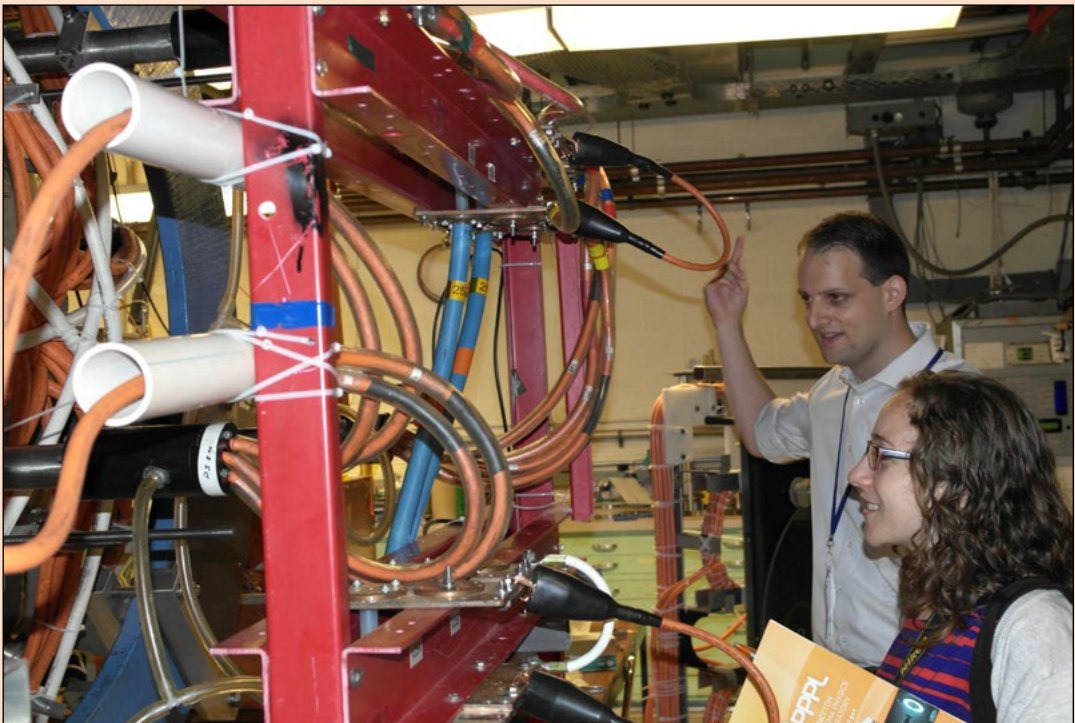
## K-DEMO Meeting at PPPL



Keeman Kim, of the National Fusion Research Institute in South Korea, discusses preliminary planning for the proposed K-DEMO fusion facility during a two-day meeting at PPPL. The Laboratory is collaborating on a pre-conceptual design for the Asian facility, which South Korea could complete in the mid-to-late 2030s as the final step before construction of a commercial fusion reactor.

## Scientific American reporter visits PPPL

Clara Moskowitz, a reporter from Scientific American, visited PPPL on June 27 to report on solar eruption experiments being conducted on the Magnetic Reconnection Experiment (MRX) for an article for the magazine's [website](#). A slideshow with the article includes a photo by PPPL photographer Elle Starkman and an image provided by graduate student Clayton Myers. Moskowitz, right, visited MRX with Myers, who has worked on MRX for more than four years. He will be joining PPPL as a postdoctoral fellow on NSTX-U in the fall. Moskowitz also interviewed Masaaki Yamada, the head of the MRX research program. She later got a tour from Adam Cohen, deputy director for operations.



## PPPL Representatives Visit Recycling Facility

Margaret Kevin-King, Leanna Meyer and Mark Hughes got to see first-hand what happens to all those recyclables from PPPL when they visited the Colgate Paper Stock Material Recycling Facility in New Brunswick on June 19 as part of PPPL's audit on waste removal. The facility processes recycling from PPPL and other sites and sorts out the paper, cardboard, soda cans, steel cans, glass and plastic bottles and prepares them for recycling. Here, bails of paper are piled up and ready for recycling.





# Three Fire Alarms During Week of June 30

PPPL's Emergency Service Unit officers responded to three fire alarms the week of June 30, two of which occurred on Monday, June 30. The first was at 12:21 p.m. when someone reported the odor of something burning and a slight haze in the Engineering Wing. The Engineering Wing was evacuated. Electricians determined the odor emanated from a computer monitor. Employees were cleared to return to the building at 12:47 p.m. Site Protection staff notified the Help Desk of the problem.

The second alarm, on Monday at 1:30 p.m., sounded after smoke was reported in the cafeteria. The LSB was evacuated. The smoke was determined to have come from a worker cleaning equipment. Site Protection staff deemed the building safe at about 1:45 p.m. and staff members were allowed to return to work.

The third alarm rang on Thursday, July 3, at 10:15 a.m. when someone reported the smell of smoke in the Director's Conference Room. The building was evacuated and investigators found the smoke issued from a black computer box. Employees returned to the building at 10:35 a.m. The Video Conferencing Services staff is investigating. During the alarm, the EVES system failed in some areas. Staff members from Facilities, Site Protection and the vendor are evaluating the system.

## 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. 14 JULY	TUE. 15 JULY	WED. 16 JULY	THU. 17 JULY	FRI. 18 JULY
					
	Herb-Roasted Chicken with Potato & Vegetable	Penne Pasta with Artichokes, Roasted Peppers, Black Olives	Cowboy Beef Brisket & Ranch-style Bean Taco Salad	Turkey Taco Salad with all the Fixin's	Gyro Salad
	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
	Ham, Cabbage Potato	Cream of Broccoli	Cajun Seafood Chowder	Creamy Potato Leek	Turkey Chili
	Swiss & Mushroom Burger served with Onion Rings	2 Texas Tommies served with Onion Rings	Pork Roll & Cheese Torpedo with Fries	Grilled Chicken Club Sandwich on a Kaiser Roll	Outdoor Picnic Buffet
EARLY RISER	Eggplant, Fresh Mozzarella, Tomato & Basil Pesto on Focaccia	Corned Beef & Swiss with Coleslaw & Russian on Rye	Breaded Pork Cutlet with Chipotle Mayo, Lettuce & Tomato	The Cubano: Pork, Ham Swiss, Pickles & Dijonnaise	Ham & Cheese Club Sandwich
COUNTRY KETTLE	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
GRILLE SPECIAL	MENU SUBJECT TO CHANGE WITHOUT NOTICE				
DELI SPECIAL	VEGETARIAN OPTION				
PANINI	CLICK HERE FOR A PRINTABLE WEEKLY MENU				

COMMAND PERFORMANCE CHEF'S FEATURE	MON. 21 JULY	TUE. 22 JULY	WED. 23 JULY	THU. 24 JULY	FRI. 25 JULY
					
	Ranch Chicken Macaroni & Cheese	Cheese Ravioli with Vegetables in a Pink Vodka Sauce	Home-style Meatloaf, Mashed Potatoes & Vegetable	Roast Chicken Fried Rice served with an Egg Roll	Broiled Tilapia & Shrimp with Wild Rice & Vegetable
	Oatmeal Raisin Pancakes with Turkey Sausage	Western Omelet with Home Fries	Pork Roll, Egg & Cheese on a Croissant	Steak, Onion & Cheese Omelet with Home Fries	Banana Walnut Pancakes with Bacon
	Chicken Wild Rice	Vegetable Soup	Turkey Corn Chowder	Cream of Mushroom	Manhattan Clam Chowder
	Fat Cat Hoagie served with Onion Rings	Denver Western Sandwich with Black Bean, Quinoa & Mango Salad	Create Your Own Omelet Bar served with Home Fries	Grilled Turkey Pastrami Reuben with Fries	Scrambled Egg, Bacon & Cheddar on a Torpedo served with Home Fries
EARLY RISER	Grilled Vegetables with Provolone and Balsamic Vinegar	Toasted Roast Beef & Cheddar Hoagie	The Pilgrim with Cranberry Compote & Watermelon Salad	Grilled Tuna Caesar Salad Wrap	Turkey, Roasted Eggplant, Red Peppers, Provolone & Spicy Mayo
COUNTRY KETTLE	Ham, Turkey, Swiss, Tomato, Banana Peppers & Honey Mustard	Tuna Melt with Tomato & Cheddar	BBQ Turkey Burger with Pepperjack, Tomato & Chipotle Mayo	Focaccia Bread with Avocado, Jack Cheese, Tomato & Red Onion	Ham, Muenster Cheese, Bacon, Tomato & Spicy Mayo
GRILLE SPECIAL	MENU SUBJECT TO CHANGE WITHOUT NOTICE				
DELI SPECIAL	VEGETARIAN OPTION				
PANINI	CLICK HERE FOR A PRINTABLE WEEKLY MENU				

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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://w3.pppl.gov/communications/weekly/>.

The PPPL WEEKLY is currently on a summer bi-weekly schedule. The next issue will be published on July 28.