

At PPPL
THIS WEEK

MONDAY, DEC. 16

Gerry Pierre, My Health Coach at PPPL

8:30 a.m. - 12:30 p.m.
Call 866-237-0972 for appointment

WEDNESDAY, DEC. 18

PPPL Colloquium

4:15 p.m. ♦ MBG Auditorium
The Lithium Tokamak eXperiment (LTX)
Richard Majeski, Princeton University

FRIDAY, DEC. 20

PPPL Holiday Luncheon

Noon ♦ LSB Lobby and Café

UPCOMING EVENTS

Dec. 23 - Jan. 1
Lab Closed - Holidays

January 11
Science on Saturday Lecture Series begins
9:30 a.m. ♦ MBG Auditorium
Containing A Star On Earth: Understanding Turbulence At 100 Million Degrees
Walter Guttenfelder, PPPL

PhD Comics' creator Jorge Cham films at the Laboratory

By Jeanne Jackson DeVoe

Jorge Cham is beloved among graduate students for his "Piled Higher and Deeper" (PhD for short) Comics about the trials and tribulations of graduate students. Science fans also enjoy his quirky science videos on complicated subjects. So there was a ripple of excitement when he came to PPPL on Nov. 22 to film a video about magnetic fusion and was able to fit in a meeting with PPPL graduate students.

Jeff Parker, one of a dozen Princeton University graduate students doing research at PPPL who met Cham, said he is looking forward to seeing the video reach an audience that doesn't know much about magnetic fusion. "I'm really excited about it," he said. "I think he did a great job on the Higgs boson video, so I have high hopes for his fusion video."

Creative Control

Cham retains full creative control of the videos he creates, which use cartoons and sometimes include live video to illustrate scientific concepts explained by researchers. He has done numerous videos on a wide variety of science subjects, available at <http://phdcomics.com/tv/>, such as a recent video debunking the notion that vaccines cause autism or a video on zombie coral reefs (a species of coral that can come back from the dead after bleaching). One of his most popular videos is "The Higgs boson explained," <http://www.phdcomics.com/comics.php?f=1489> in which he combines cartoon illustrations and real videos of CERN, the European Organization for Nuclear Research, near Geneva, Switzerland, to explain the elusive Higgs particle.

Cham crammed a lot into his day at PPPL. After meeting with Deputy Director Adam Cohen, his first stop was PPPL's National Spherical Torus Experiment where he in-

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Season's Greetings
from all of us at the



Princeton Plasma Physics Laboratory

Greenwald, Starkman and Cane win top communications award from CASE

John Greenwald, Elle Starkman and Christopher Cane, of PPPL's Office of Communications, learned last week that they will receive top honors from the Council for the Advancement and Support of Education District II for their work aimed at communicating the Lab's cutting-edge research to the public.

Science Writer Greenwald won a gold medal Accolades Award for science and research writing, photographer Starkman won a gold medal for color photography, and Webmaster Cane won a silver medal for "best institutional homepage."

"Obviously, I'm extremely proud of our Communications team and the accolades they have accumulated," said Adam Cohen, deputy director for operations. "I also believe that the recognition is a testament to the team's strength in the varying communications mechanisms (writing, photography and web design) we have endeavored to grow and exploit."

Greenwald won the award for his article on PPPL's new nanolaboratory, which is focused on studying and optimizing the use of plasma for producing nanomaterials. Greenwald came to PPPL in January of 2012. He was a senior writer at Time magazine, where he worked for nearly 20 years. He then spent five years as managing editor of NJBiz, a weekly business magazine in New Jersey, which won some two dozen awards under his leadership. He is the editor of PPPL's Quest magazine, which launched this year, and is chair of the Colloquium Committee.

Starkman was honored for her striking "Iron Lotus" photo, which was one of several images published last year in the Russian journal "Science Firsthand" in a photo essay called "Science in Pictures." Starkman took the photos in 2011 of a liquid metal called a ferrofluid responding to a magnet and transforming from a liquid into a lotus-like shape. The photo was also displayed in the 2011 Art of Science exhibit. Starkman has been a PPPL photographer for 16 years and previously worked for Rockefeller University in New York. She and Andrew Zwicker won first place in the Art of Science Exhibit in 2005 for their photo of a dusty plasma.



The three CASE award winners: From left to right: Webmaster Christopher Cane (with the PPPL website on view behind him), science writer John Greenwald and photographer Elle Starkman.

Cane came to PPPL in 2009 after more than 20 years of experience in software and website development at Dow Jones, Merrill Lynch and the Institute for Advanced Study in Princeton. He won his award for heading the redesign of the PPPL website, which marked the first anniversary of its launch on Nov. 20. The judges said, "The website clearly meets its objective of informing people about fusion and plasma research," and the "layout and color palette is aesthetically pleasing." They praised the "clever and simple design" of the "Spotlight" at the center of the page and the inclusion of the PPPL blog and "PPPL in the News" link. Cane is now heading the redesign of the Laboratory's internal website.

CASE District II is the largest regional chapter of the Council for Advancement and Support of Education (CASE), a professional association of communications, marketing and alumni relations professionals. The chapter represents 675 universities, colleges and private schools in six states, as well as Washington D.C., Puerto Rico, the U.S. Virgin Islands and Ontario. The awards will be presented at a ceremony on Feb. 10 in Baltimore. ☎

D-T anniversary salute from Jerry Faul

Jerry Faul was deputy manager and chief contracting officer for DOE's Princeton site office when PPPL produced its historic deuterium-tritium shot on Dec. 9, 1993. He went on to serve as site manager from 1996



Jerry Faul
Former deputy manager
DOE Princeton
Site Office

until he retired in 2010. Here Faul reflects on that first, record-setting D-T experiment on the Tokamak Fusion Test Reactor.

"Deuterium-tritium was one of the goals that we put into the contract for the Laboratory to achieve. This was something that had never been done before and it was pretty spectacular to pull it off. The safety considerations were very high. If you were a real fusion experimenter, this was the place on Earth to be that day." ☎



The original group poses in the control room for the 20th anniversary. Front left to right: Marilee Thompson, Steve Sabbagh, Eric Fredrickson, Michael Zarnstorff; back left to right: Ken Hill, Dave Johnson, Charles Skinner, Brent Stratton and Lane Roquemore. Ken Hill's name was incorrect in last week's Weekly.

Discovery Magazine features article on magnetic fusion research at PPPL



Princeton University's annual research magazine, "Discovery: Research at Princeton," has a plethora of articles on cutting-edge research, including an extensive story by John Greenwald entitled "The Princeton Plasma Physics Laboratory: Blazing a Path to Fusion Energy," in which Greenwald outlines the challenges of developing magnetic fusion as a clean and limitless source of energy and explains how PPPL's \$94 million upgrade to the National Spherical Torus Experiment (NSTX-U) and future research on the device will help accomplish that goal. The magazine is available online at discovery.princeton.edu. Copies are also available from the PPPL Office of Communications or the office of the Princeton University Dean for Research.

The following article by Catherine Zandonella, Office of the Dean for Research, who edited the magazine, and Matilda Luk, Princeton University Office of Communications, who designed it, is featured as the lead story on the homepage of Princeton University's website, <http://www.princeton.edu/main/>.

Adventure on the high seas. Hunting for planets outside our solar system. Searching through archives for a lost manuscript. These are some of the activities that engage Princeton University researchers and lead to discoveries. These stories and many others are now available in the pages of the University's annual research magazine, "Discovery: Research at Princeton."

Published by the Office of the Dean for Research each fall, "Discovery" offers a view of the activities and scholarship that make Princeton one of the world's renowned research universities. Through stories and art, the magazine reports on how faculty members, staff researchers and students are producing knowledge in areas such as cancer research, health care policy, environmental science, the arts and much more.


In the current issue, readers can find out:

Why geoscientists find the icy, inhospitable Southern Ocean to be so alluring (it plays a major role in stabilizing the Earth's climate and marine food chain).

Why a Princeton astrophysicist had to go to three continents to set up his planet-finding telescopes (it is always nighttime somewhere).

How a graduate student in the Department of History became fascinated with a neglected book in a London archive (the book was the source material for a popular 17th-century English version of the Muslim holy book, the Quran, that did much to dispel myths about the religion).

The magazine contains articles from engineering, the natural sciences, the social sciences and the humanities, and covers faculty-led research as well as student thesis work and contributions from graduate students and postdoctoral researchers.

"Discovery" is online and print copies may be requested from the Office of the Dean for Research. The magazine is produced by the Office of the Dean for Research with editorial and design services provided by the Office of Communications. 



Holiday Party Luncheon

FRIDAY, DEC. 20

12:00 NOON - LSB LOBBY AND CAFETERIA

- Roast Turkey/Roast Pork Loin Carving Station • Tossed Green Salad • Bread Display Table • Vegetable Crudite • Fruit Tray • Assorted Passed Hors D'oeuvres •
- Italian Sausage and Peppers • Mashed Potato Bar with Toppings • Pasta Station with Various Toppings • Coffee, Tea, Soft Drinks •

Open to Everyone Working at the Lab!

WORLD FAMOUS PPPL SKIT
IN THE AUDITORIUM

GIFT RAFFLE (donations made by PPPL Council)

AFTER THE SKIT IN AUDITORIUM - YOU MUST BE PRESENT TO WIN

Interested in contributing a dessert?
Contact holidaypartycommittee@pppl.gov



PhD Comics

continued from page 1

interviewed physicist Stefan Gerhardt for about an hour. “He seemed excited,” said Gerhardt. “He asked a lot of questions.”

Cham had lunch with Director Stewart Prager and Deputy Director Michael Zarnstorff. Accompanied by Director of Communications Kitta MacPherson and photographer Elle Starkman, who served as a back-up cameraperson, he also visited QUASAR with Hutch Neilson, Director of Advanced Projects. He toured the coil-winding facility with engineer Kelsey Tresemer and visited the Science Education Laboratory. He left full of ideas for turning the concepts of plasma and fusion into a video.

“I think it went really well,” said physicist Arturo Dominguez, a postdoctoral fellow in PPPL’s Science Education Department who paired up with Andrew Zwicker, head of Science Education, to talk to Cham and show him some plasma demonstrations. “He seemed very engaged and had some smart questions. He was genuinely interested in what we do here.”

Among the experiments they showed Cham were the Remote Glow Discharge Experiment, which would allow someone to manipulate plasmas from miles away from PPPL; the plasma speaker, the Tesla coil and an atmospheric plasma demo with medical applications that emits a plasma and looks for all the world like a small light saber from “Star Wars.” Cham was excited about that one. “I mean light sabers – come on!” Cham later told the students.

Dominguez said he is a PhD Comics fan and he can’t wait to see the final product. “I’m interested in seeing what he does with it and how he digests all the information he got here,” he said.

In between stops on his tour, Cham enjoyed some cookies with the graduate students and gave them a little background about himself. He has a PhD from Stanford University in robotics but his career as a cartoonist and science video maker haven’t had much to do with his education except as fodder for his comic strip. “I didn’t do anything related to that,” he said.

“Are you going to put PPPL in your comic?” one of the students asked him. “That’s the plan,” Cham replied. “We’re working together to create some video about plasma.”

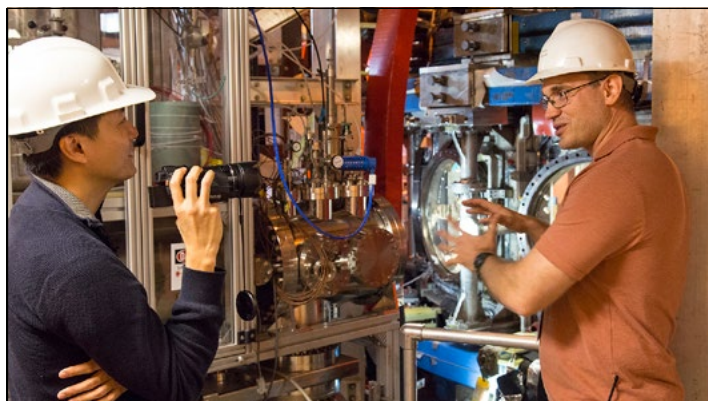
Cham said he might never have come to PPPL if it weren’t for MacPherson. “I said, ‘Could you just consider coming?’” MacPherson added. “That’s why it’s so cool. He only works on projects that interest him. And he thinks this is interesting!”

A one-man show

Cham told the students that he does all the art and writing for the comic strip, which he draws on an electronic tablet. The art for the strips generally takes about two hours, while the writing takes anywhere from 30 minutes to 10 hours. “I do everything myself,” he said. “It’s a one-man show.”



Cham, center right, got a chance to talk to graduate students about their experiences at PPPL.



Jorge Cham films physicist Stefan Gerhardt as he explains how the National Spherical Torus Experiment (NSTX-U) operates.

Cham began writing the comic strip for the student newspaper The Stanford Daily as a mechanical engineering graduate student in 1997 and kept it up while getting his PhD and doing his postdoctoral work. After two years as a postdoctoral instructor and researcher at the California Institute of Technology, he gave up academic life to do the comic full-time. He has expanded PhD Comics into video making and has published five collections of the comic strips and created a line of merchandise. His website, <http://www.phdcomics.com>, where the comic is available free, gets more than 7 million unique visitors a year. (See the comic on page 5).

Today, “Piled Higher and Deeper” appears in The Stanford Daily, at MIT, Carnegie Mellon University and more than 50 other student newspapers and has been featured in numerous publications including Nature, Science Magazine, the New York Times and the Washington Post websites.

Cham has also become a speaker who packs theaters on college campuses with his talk on, “The Power of Procrastination.” More than a dozen lectures were scheduled in 2013, including stops at universities in Norway, London, Canada and Israel, as well as Penn State University, the University of North Carolina and North Carolina State University.

Students discuss why they chose plasma physics

Cham seemed genuinely interested in the students’ lives when he met with them and asked as many questions as he answered. When he asked the students why they got into plasma physics to begin with, Jacob Schwartz said he was inspired by the movie “Spiderman 2,” in which the villain Doc Ock creates a new power source using fusion. Tyler Abrams said he was attracted to the goal of producing plentiful, inexpensive energy. “The physics itself was very interesting,” he said. “It’s really the direct route to producing power.”

Cham asked whether magnetic fusion has gotten a bad rap in the media. Matt Lucia said he thinks it has and the media has failed to see how much research has moved forward. “What’s never talked about is all the progress in the last 40 years,” he said, including a huge increase in the amount of power magnetic fusion can produce.

The students were very interested in Cham’s cartoon. One student suggested he create a cartoon about a long-distance relationship that could work PPPL into the comic strip. Cham half-jokingly tried to get them to dish some dirt about their advisors or their travails in the graduate program. “Any sad stories, bad things about your advisor?” he asked. But the students didn’t have much material for him. “We’re generally pretty happy here compared to other grad students,” said Lucia.

Later, students said they were eager to see what Cham does with the material he filmed at PPPL. “I’m excited to see it,” said Abrams. “The more exposure for fusion, the better,” Lucia agreed. ☺

2014

Science on Saturday

Princeton University Plasma Physics Laboratory Lecture Series



January 11	CONTAINING A STAR ON EARTH: UNDERSTANDING TURBULENCE AT 100 MILLION DEGREES by Walter Guttenfelder, Research Physicist, Princeton Plasma Physics Laboratory
January 18	PHYSICS OF CANCER by Wolfgang Losert, Associate Professor, University of Maryland
January 25	THE ATMOSPHERE AS A LABORATORY: AEROSOLS, AIR QUALITY, AND CLIMATE by Peter DeCarlo, Assistant Professor, Drexel University
February 1	THE INVISIBLE WORLD OF MARINE MICROBES: HOW EARTH'S SMALLEST LIVING THINGS HAVE THE BIGGEST IMPACT ON HOW OUR OCEAN WORKS by Kay Bidle, Associate Professor, Institute of Marine and Coastal Sciences, Rutgers University
February 8	UNCOVERING OUR COSMIC ORIGINS: WHAT WE KNOW, WHAT WE CAN KNOW, AND WHAT LIMITS WE MAY FACE. by William Jones, Assistant Professor of Physics, Princeton University
February 15	BLOWN AWAY: WHAT KNOT TO DO WHEN SAILING BY SIR RANDOLPH BACON III (COUSIN -IN-LAW TO COLIN ADAMS) by Colin Adams, Thomas T. Read Professor of Mathematics, Williams College
February 22	NO LECTURE — DOE'S NJ HIGH SCHOOL SCIENCE BOWL®
March 1	CAN STUDYING INFINITE DIMENSIONAL SPACE HELP US IMPROVE HEALTHCARE? by David Scheinker, Joint Research Fellow at The MIT Sloan School of Management and Massachusetts General Hospital, Drexel University
March 8	FROM MOOC TO MIIC: CAN EFFECTIVE LEARNING BE BIG? by Mung Chiang, Arthur LeGrand Doty Professor of Electrical Engineering, Princeton University
March 15	WHAT ART CAN TELL US ABOUT THE BRAIN by Margaret Livingstone, Professor of Neurobiology, Harvard University

Science on Saturday is a series of talks geared toward high school students but open to all. Talks are held in the MBG Auditorium. Doors open at 8:15 a.m. Lectures begin promptly at 9:30 a.m. and usually last one hour followed by a moderated question-and-answer session ending by 11:15 a.m.

PPPL Hosts Princeton University "Spin" Luncheon

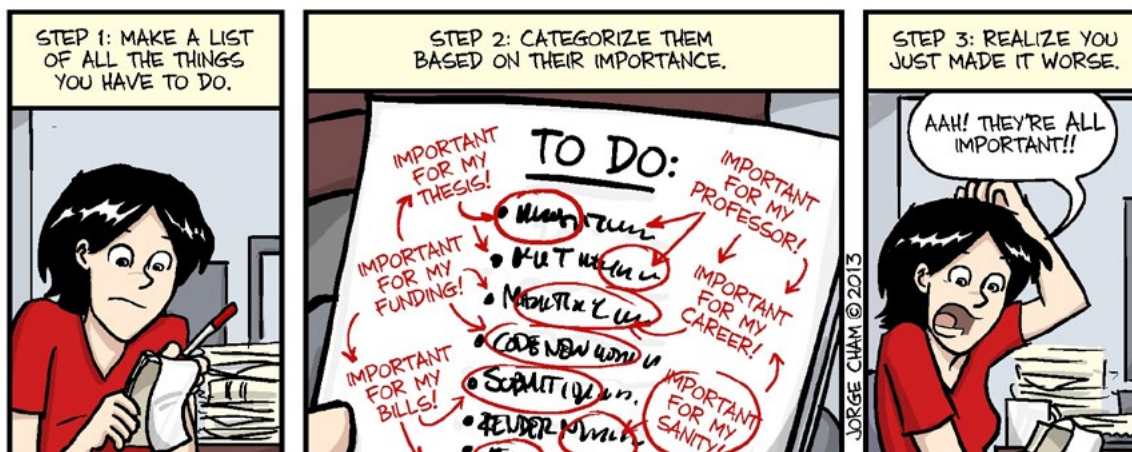


PPPL hosted about 35 people from Princeton University's "Spin" group of communications professionals from across the University on Dec. 6. Here Andrew Zwicker, far right, head of Science Education, gives a reprise of his TEDx talk on, "Creating a Star on Earth: The Path to Fusion Energy." Kitta MacPherson updated the group on communications projects at PPPL and Arturo Dominguez gave a live demonstration of his Remote Glow Discharge Experiment, in which he used a computer in a conference room on the third floor of the building to manipulate a plasma in the device located in the Science Education laboratory on PPPL's first floor.

PhD Comics comes to the PPPL Weekly!

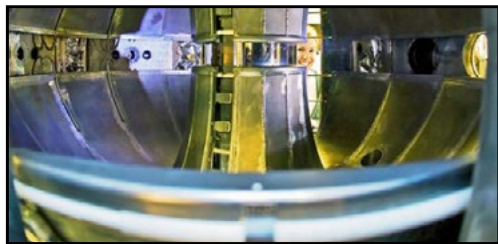
In this issue, PPPL Weekly is debuting "Piled Higher and Deeper," (PhD) Comics by artist and writer Jorge Cham. Do you think this would be a good addition to the PPPL Weekly? Let us know what you think by emailing jjackson@pppl.gov.

WHAT TO DO WHEN YOU'RE OVERWHELMED WITH WORK



"Piled Higher and Deeper" by Jorge Cham • www.phdcomics.com

COLLOQUIUM



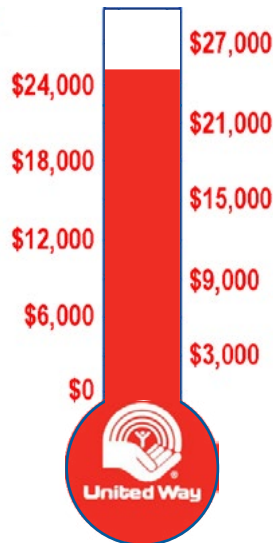
The Lithium Tokamak eXperiment (LTX)

RICHARD MAJESKI
Princeton University

Wednesday, Dec. 18

4:15 p.m. (Coffee/Tea at 4 p.m.) • MBG Auditorium

PPPL's contribute to United Way



Thank you to all the PPPL'ers who contributed \$ 24,900.37 to the PPPL and Princeton University United Way as of Dec. 11. We also raised \$448 from the two bake sales held at PPPL. Your contributions will help numerous organizations in Mercer county, including groups that mentor at-risk high school students in Trenton, provide housing for homeless people and help seniors and a group that helps people with disabilities stay in their homes. The deadline was Dec. 6 but donations are still being accepted!

Desserts Needed for Holiday Party

The PPPL Holiday Party will be held on Friday, Dec. 20 at noon. All Lab employees are invited to bring in a dessert for all to enjoy.

We ask those who plan to bring in a dessert item to:

- Notify the "committee" by email (HolidayPartyCommittee@pppl.gov) in advance that you will be bringing a dessert and what you plan to bring.
- Bring the dessert item in on the day of the party by 10 a.m. and drop it off in the in the cafeteria on the designated table.
- Desserts should be in or on a disposable dish or container. If a non-disposable container is used, please be sure that your name and PPPL extension are marked on the bottom of the container and remember to pick up your container at the end of the party!
- Cakes, pies, and other items requiring slicing should be pre-sliced if possible. Serving utensils such as knives, spatulas, spoons, etc. (preferably disposable) should be provided for all desserts requiring them.

Thank you in advance for your participation — we look forward to many yummy desserts at the Holiday Party!!

Food Contributions Needed for Local Food Bank

Please help people in our community who do not have enough to eat this holiday season by bringing your donations to the LSB lobby from now through Dec. 18.

The donations will be sent to the Mercer Street Friends Food Bank, which provides food to more than 25,000 people through 50 pantries, shelters and soup kitchens.

The most needed items are canned protein such as tuna fish or chicken, Parmalat, cereals, and peanut butter and jelly. The Food Bank also needs personal care products such as soap, shampoo, deodorizer, feminine products and laundry soap.

Items needed for the Send Hunger Packing Program, which provides food to school-aged children to get them through the weekend, include: single servings of Parmalat, individual servings of cereal and individual servings of microwaveable food, granola bars and pudding cups.

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

	MON. 16 DEC.	TUE. 17 DEC.	WED. 18 DEC.	THU. 19 DEC.	FRI. 20 DEC.
COMMAND PERFORMANCE CHEF'S FEATURE	 Marinated Grilled Chicken Breast	 Baked Ziti with a Side Salad & Garlic Bread	 Carved Pepper-Crusted Beef with Roast Potatoes	 Baked Potato Bar	 <p>Annual <i>holiday</i> LUNCH</p> <p>Noon LSB Lobby and Café</p>
EARLY RISER	Roasted Veggie & Potato Scrambled Egg Quesadilla	Baked Oatmeal with Pumpkin & Bananas	Cranberry Orange French Toast with Cinnamon Cream Cheese	Blueberry Pancakes with Crispy Bacon	
COUNTRY KETTLE	Potato & Red Pepper Chowder	Curried Chicken & Vegetable with Rice	Tomato Soup	Lentil Soup	
GRILLE SPECIAL	Fresh Hand-Crafted Beef Burger with a Variety of Toppings & Fries	Turkey Burger with Pork Roll & Cheddar Cheese with Onion Rings	Fish Tacos served with Black Bean & Roasted Corn Salsa	Ultimate Chicken Cheesesteak served with Fries	
DELI SPECIAL	Grilled Tuna Caesar Wrap with Romaine, Tomato & Parmesan	Roast Beef & Bacon Pita with Avocado & Spring Mix	Traditional Chef Salad Wrap	Tuna Salad, Basil Pesto, Cucumber & Leaf Lettuce on Focaccia Bread	
PANINI	BBQ Pulled Pork on a Kaiser Roll with Firecracker Slaw	Fried Flounder, Pepperjack, Tomato & Tartar Sauce on Ciabatta	Grilled Hawaiian Cordon Bleu on Ciabatta	Caprese with Fresh Mozzarella, Tomato, Basil	
VALUE MEAL \$5	Flat Bread Pizza with Tossed Salad & 12 oz. Beverage	Spaghetti & Meatballs with Tossed Salad & 12 oz. Beverage	Grilled Cheese & Tomato with Small Soup & 12 oz. Beverage	Italian-Style Hoagie with Potato Chips & 12 oz. Beverage	

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** ♦ Web: **Chris Cane** ♦ Admin. support: **Pamela Hampton**

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

The PPPL Weekly will not be published on Dec. 23 and Dec. 30 due to the Christmas and New Year's holidays. The next issue will appear on January 6, 2014.