

At PPPL THIS WEEK

JULY 27-JULY 30

Energy Camp
Science Education Laboratory

JULY 27-AUGUST 8

Facility condition assessments

TUESDAY, AUGUST 4

Small Group Safety Training
10:30 a.m. to 12 p.m. ♦ MBG
Auditorium

FRIDAY, AUGUST 7

Open Public Tour
10 a.m.
Email tours@pppl.gov

UPCOMING

WEDNESDAY, AUGUST 12

Poster session for summer students
LSB lobby

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A.J. Stewart Smith to step down as Princeton University vice president for PPPL in 2016

By John Greenwald

As a young man, A.J. Stewart “Stew” Smith won the Canadian National Lacrosse Championship as a member of a powerful Vancouver, British Columbia, club team. That early success and love of teamwork foreshadowed an illustrious career in which Smith has played leading roles as an educator, administrator and particle physicist. Now, after nearly 50 years on the faculty and staff of Princeton University, Smith is stepping down next February from his current post as the University’s initial vice president for the Princeton Plasma Physics Laboratory (PPPL). “This is a natural transition,” said Smith, who turned 77 in June. “My wife is very pleased.”



A.J. Stewart Smith

A search for Smith’s successor, led by Pablo Debenedetti, Princeton Dean for Research, is currently under way.

Smith’s lengthy career is studded with firsts. He served as Princeton’s first Dean for Research before moving to PPPL, which the University manages for the U.S. Department of Energy (DOE). As a visiting scientist at the Stanford Linear Accelerator Center (SLAC) in the 1990s and early 2000s, he was in charge of a multinational team of 600 physicists and engineers when it found a stunning new example of an asymmetry in nature that helps to explain why the universe contains stars, planets and people rather than nothing at all.

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Michael Williams retiring as head of Engineering and Infrastructure

Michael D. Williams, the Director of Engineering at PPPL since 1991, will retire on Sept. 30 after a total of 39 years at the Laboratory. Williams came to the Laboratory in 1976 after graduating from Rutgers University with a degree in electrical engineering.



Michael D. Williams

Williams has worked on most of the major experiments at PPPL since then, including the Princeton Large Torus (PLT), the Poloidal Divertor Experiment (PDX) and the Tokamak Fusion Test Reactor (TFTR). He oversaw construction of the National Spherical Experiment (NSTX) and the \$94 million upgrade of the device (NSTX-U), which is nearing completion.

“Mike has too many accomplishments on too many acronym-filled fusion device names to list,” Adam Cohen, deputy director for operations, said in an email to the staff announcing Williams’ retirement. These accomplishments, Cohen said, include “the fantastic job he has done in ensuring that the NSTX-U will be the most robust fusion facility of its kind in the world and is ready to produce very exciting science for years to come.”

Chuck Kessel Wins the 2015 Fusion Technology Award

By Raphael Rosen

Chuck Kessel, a principal engineer at PPPL, has won the 2015 Fusion Technology Award. The honor, from the Institute of Electrical and Electronics Engineers' (IEEE) Nuclear and Plasma Sciences Society, recognizes outstanding contributions to fusion engineering and technology.

"Chuck has long been a widely recognized pioneer in developing advanced tokamak operating scenarios that have served as the basis for several machine design concepts," said Michael D. Williams, associate director for engineering and infrastructure at PPPL and a past recipient of the honor. "Receiving the 2015 Fusion Technology Award duly recognizes Chuck's outstanding contributions to the development of fusion technology."

Presentation of the award came during the 2015 Symposium on Fusion Engineering (SOFE) that was held in June in Austin, Texas. The annual event focuses on the latest developments in the quest for fusion energy. While at the conference, Kessel gave a plenary talk about the Fusion Nuclear Science Facility (FNSF), a proposed next step in the U.S. fusion program. Kessel heads a nationwide study that will detail options for the FNSF and consider its role in relation to ITER, the international experiment under construction in France to demonstrate the feasibility of fusion power.

Kessel joined PPPL in 1987 after earning bachelor's degrees in physics and nuclear engineering from the University of California-Santa Barbara, and a Ph.D. in fusion engineering and applied plasma physics from UCLA. He initially performed both neutronics – the study of neutrons that emerge from plasmas – and plasma control calculations for the design of the Burning Plasma Experiment (BPX), a fusion facility that was targeted to produce about 100-500 megawatts of fusion power, which at a minimum would equal the heating power but was hoped to exceed it. This design was a compact high magnetic field configuration tokamak and was never built. He soon transitioned to plasma physics research, simulating how plasmas evolve in fusion facilities, among other projects. He has helped design South Korea's Korea Superconducting Tokamak


Advanced Research (KSTAR) device, run simulations for Germany's Axial Symmetric Divertor Experiment (ASDEX), and has been a consultant on the design for ITER. He also is part of a PPPL team working on the pre-conceptual design of South Korea's K-DEMO, a proposed device that could serve as the forerunner of a commercial fusion power plant.




Chuck Kessel

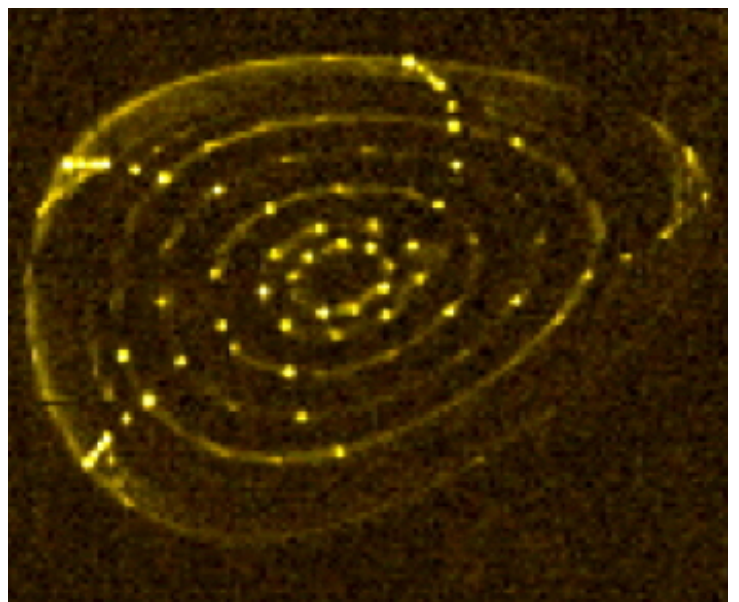
"What intrigues me about working on fusion projects is learning about a new device and what it must achieve," Kessel said. "This usually becomes the starting point for learning new physics, understanding how systems work and interact, and creating solutions that remain within the constraints that are imposed. The integrated solution is always more interesting to me than a solution that addresses only one issue and ignores the other 10."

His comprehensive approach is widely appreciated. "Kessel's work has always been at the intersection of plasma research and technology," said Richard Hawryluk, the head of the ITER and Tokamaks Department at PPPL. "His winning the Fusion Technology Award is especially appropriate since the development of fusion power systems will require individuals with a keen understanding of both the technological implications and the underlying physics. Chuck thrives in this intersection of science and technology."

Kessel's 2015 Fusion Technology Award continues a tradition of recognition for PPPL engineers for extraordinary achievement. Philip Heitzenroeder won the IEEE honor in 2013 and Williams received it in 1993. 

First test of W 7-X magnetic field successful

Researchers at the Max Planck Institute in Greifswald, Germany, successfully tested the magnetic field in the Wendelstein 7-X stellarator, which is scheduled to begin operations this year. This high-speed photo, obtained through electron beam mapping, shows the nested magnetic surfaces that will contain the plasma. PPPL leads U.S. participation in the German facility. In a congratulatory note, David Gates, stellarator physics leader at PPPL, said the Laboratory "and the entire U.S. collaboration team are extremely excited to see the initial field line mapping results from the Wendelstein 7-X device. We applaud the IPP team and the Max Planck Institute for this very beautiful and important step towards plasma operations. This is a major accomplishment that demonstrates the viability of the basic design and functioning of the Wendelstein 7-X. We look forward to continuing to work with our German colleagues on this intriguing scientific experiment and to its coming important research contributions to fusion energy." 



Credit: Matthias Otte, IPP

A.J. Stewart Smith profile

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Advocate for research

“Stew Smith has been a tremendous advocate for research at Princeton as our first vice president for PPPL and as our founding dean for research,” said Princeton President Christopher L. Eisgruber. “In his work with PPPL, Stew has strengthened Princeton’s longstanding relationship with the U.S. Department of Energy, and he designed and implemented University governance structures that enhance the Laboratory’s management practices and its formidable scientific work. He has increased interaction between PPPL and the University’s main campus and championed the societal benefits of the quest to create viable fusion energy. We are deeply grateful for Stew’s many contributions to Princeton’s research enterprise over his nearly 50 years as a widely respected scientist and teacher and as an exceptional leader.”

At PPPL, Smith oversees the scientific, operational and strategic planning functions of the Laboratory and serves as primary liaison with the DOE. Among the major initiatives developed on his watch has been construction of the \$94 million upgrade of the National Spherical Torus Experiment, the Laboratory’s major fusion facility. He lumps himself together with PPPL Director Stewart Prager and deputy directors Adam Cohen (operations) and Mike Zarnstorff (research) as members of what he calls “The Gang of Four.”

His achievements are recognized at DOE. “We commend Stew Smith for his broad perspective in science management and for the vital role that he has played in working with Princeton University, DOE and PPPL to advance the science at PPPL,” said Patricia M. Dehmer, acting director of the DOE’s Office of Science, the largest single supporter of basic research in the physical sciences in the United States. “We very much hope that the kind of engagement of Princeton University in the life of PPPL that Stew Smith has cultivated will continue into the future.”

Singular experience

For Prager, working with Smith has been a singular experience. “Stew Smith brings excellence and uniqueness to the critical position of University vice president for PPPL,” Prager said. “His combination of high scientific stature, extensive experience in the DOE national lab complex, and deep knowledge of the University is impressively embodied within one person. This, combined with his high-energy, brilliant ability to innovate and find new solutions, has made him an amazingly effective vice president and enormous fun to work with.”

Smith grew up in Victoria, British Columbia, as a sports-minded youngster who played rugby and lacrosse. He earned bachelor’s and master’s of science degrees from the University of British Columbia, and played lacrosse for two summers with the Vancouver Carlings — a dominant club that won four national championships in the 1960s, beginning with the team’s first in 1961. He enjoyed both science and humanities courses as a student and had to decide which path to pursue. “It was not an easy choice,” he recalls.

Smith received his doctorate in physics from Princeton in 1966 and joined the faculty the following year after a postdoctoral stint in Hamburg, Germany. He became Princeton’s Class of 1909 Professor of Physics in 1992 and chaired the Physics Department from 1990 to 1998. More advancements followed:



Smith, second from left, scoring a goal for the Vancouver Carlings during a 1961 Canadian National Lacrosse Championship game.

He unified and expanded Princeton’s research operations as dean for research from 2006 to 2012 before embarking on the position of University vice president for PPPL.

Smith probed subatomic mysteries at Princeton, U.S. national laboratories and CERN (the European Organization for Nuclear Research) in Switzerland all the while. He was a founder of a Brookhaven National Laboratory team that set up an experiment to hunt for an exceedingly rare form of decay of a particle called a K meson, a decay seen as a once-in-10 billion event. The experiment ran for more than a decade before the decay was finally observed in 1997 — a finding that won Smith and collaborators the American Physical Society’s 2011 W.K.H. Panofsky Prize in Experimental Particle Physics.

Breakthrough at BaBar

At SLAC, Smith played increasing roles in the construction and scientific operation of the historic BaBar experiment that shed light on the puzzle of why anything exists. According to standard cosmology, the Big Bang that gave birth to the universe created equal amounts of matter and oppositely charged antimatter, which annihilate each other on contact. So if the two are perfect mirror-image twins, nothing should by now exist. But if the two can be shown to have at least some different properties, the disparity could indicate how matter has come to predominate.

Such disparity is precisely what the BaBar experiment, whose whimsical name came from the elephant in the French children’s book, discovered under Smith’s leadership in 2001. The findings showed that particles called B mesons behave differently from their antiparticles, thus confirming a theorized asymmetry called “charge-parity (CP) violation” that scientists believe has allowed matter to gain the upper hand.

The discovery capped a decades-long search for a fresh example of CP violation, which was first spotted in the

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Physicist Steve Sabbagh was among speakers at the third annual PPPL-hosted International Energy Agency workshop on the Theory and Simulation of Disruptions. Some 40 experts, including representatives from ITER and the U.S. Department of Energy, attended the three-day session held the week of June 13. The workshop, for which Theory Department Director Amitava Bhattacharjee served as lead organizer, focused on causes, avoidance, and methods for mitigating disruptions in tokamaks, and specifically in ITER. The Disruption Mitigation System (DMS) in ITER, for which the United States is responsible, is scheduled for final review in 2017. “I still feel the fierce urgency of the 2017 deadline,” Bhattacharjee said in concluding remarks to the workshop. “What’s good is that we are making progress through experiment and theory on some important fronts, and converging on results that look to be in agreement, helping us move forward.”

A.J. Stewart Smith profile

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behavior of K mesons and their antiparticles by physicists Val Fitch of Princeton and James Cronin of the University of Chicago in 1964. That finding created a sensation and brought Fitch and Cronin the Nobel Prize in 1980. But not until the BaBar experiment could a new example of CP violation be found. “People have looked for this or the equivalent under every rock,” Smith said in 2001.


Hunt for the Higgs boson

Smith’s work on BaBar led to a new role at CERN, which was gearing up to hunt for the Higgs boson, the particle that gives other particles their mass according to the Standard Model of subatomic physics. From 2004 to 2009 Smith served as chief referee for construction of the Compact Muon Solenoid (CMS) experiment, one of the two enormous particle detectors that spotted the Higgs in 2012. “My goal was to give tough love to keep the project on track and help it avoid problems we had experienced in BaBar,” Smith said of the work.

“Stew is a dedicated and immensely talented scientist who demands a high standard for himself and from everyone around him,” said Sir Tejinder Virdee, who co-founded the CMS experiment and headed it for many years. “He wants to see results and with his probing mind, his inquisitive nature, and through constructive collaboration, we all got to see amazing results from CMS with the discovery of the Higgs boson — a momentous discovery in which Stew can rightly claim a part.”

As a scientist, Smith has lived through major transitions in particle physics that have seen experiments grow ever larger, with ever-more researchers and engineers. Nearly 4,000 people have participated in the CMS experiment, for example. “My generation was always in the shadow of giants like Val Fitch” who worked in small groups, he recalls. But the big-team approach to particle physics has suited Smith well. “Maybe it comes from playing sports,” he said, “but I like to do things in a team fashion.”

Smith will have plenty of opportunity to work in that fashion after he steps down from PPPL next year. At CERN, Smith will continue to chair an advisory committee for the planned 2023 upgrades of experiments at the Large Hadron Collider, the world’s largest and most powerful particle accelerator. Smith also chairs a high-level advisory committee at the National Institute of Nuclear Science in Italy, and heads an international panel that advises on the next generation of experiments at SNOLAB, an underground laboratory in Ontario, Canada, that specializes in neutrino and dark matter research.

Asked to name his proudest achievement, Smith says it’s a tossup between finding CP violation with the BaBar experiment and developing new governance structures for enhancing research and management at PPPL. Such milestones reflect the diverse sides of a remarkable, and remarkably varied, career that shows no sign of slowing down. 

A successful Facilities Information Management Systems review

A team reviewing PPPL's facilities information management systems, the DOE system that keeps track of real property data, completed a five-year Data Validation Review at PPPL from July 14 to 15 and the validation was considered a success.

Maintaining accurate and credible data in FIMS is critical to efficient operations and resource planning and DOE is required to certify the accuracy of the data. The team reviewed over 50 data elements during its visit to PPPL.

The DOE Validation Team members included Laura Troche, DOE Chicago Integrated Support Center, Adam Pugh and Mark Gordy, DOE Office of Asset Management, and John Yates, DOE Office of Operations Program Management. In addition, Joe Eng, Jeff Makiel and Brian Bozarth of the DOE Princeton Site Office participated, along with Jessica Villafane, Brookhaven Site Office intern.

The PPPL FIMS Team included Mike Viola, Dolores Stevenson and Kate Morrison along with assistance from many PPPLers.

Thanks to all those who supported our efforts for the data validation! 🙏



FIMS Data Validation Team, from left to right: Adam Pugh, Laura Troche, John Yates, Kate Morrison, Mark Gordy. (Photo by Dolores Stevenson)

Facility condition assessments July 27 to Aug. 12

PPPL staff should be aware that Facilities & Site Services will be performing facility condition assessments from Monday, July 27 through Wednesday, Aug. 12 in the following areas:

- C-Site — All buildings and rooms
- Canal pump house
- D-Site — All mechanical equipment rooms

A Subcontractor, VFA, Inc., will conduct these physical, non-invasive assessments. The survey will include a visual inspection of the building and all of the building's architectural, mechanical, and electrical systems. The inspection of the building interiors will include all mechanical and electrical rooms.

The VFA Team may wish to speak with building facility managers or staff members during the assessments, if they are available. Please extend your full cooperation so that the data collected is as accurate as possible.


The information gathered will be used to add new data into the DOE Facilities Information Management System (FIMS) database per DOE requirements.

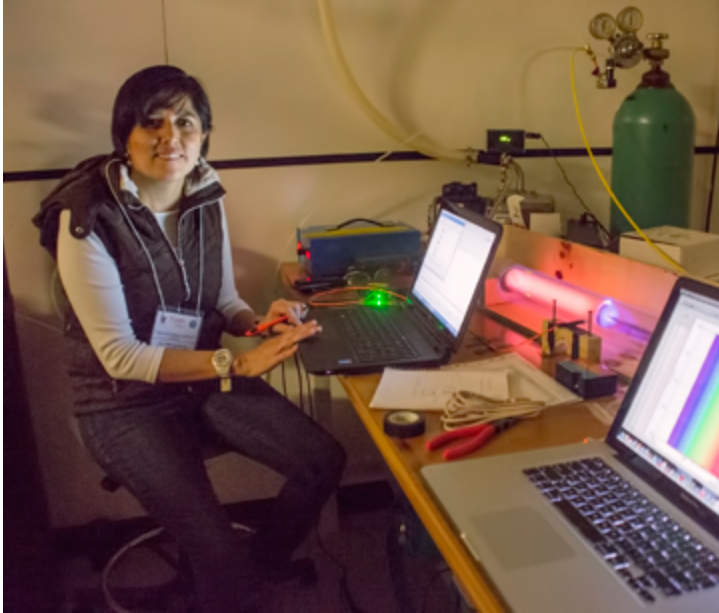
Thank you for your cooperation.

If you have any questions, please contact Martin Donohue (Ext. 3510) or Dolores Stevenson (Ext. 3737).

PPPL hosts program for physics professors

PPPL's Science Education Department hosted 10 college professors from all over the United States and the world from July 7 to 9 as part of the Advanced Laboratory Physics Association's Laboratory Immersions program, which allow academics to take part in a single intense laboratory experiment over two to three days. The participants took part

in experiments in electrical breakdown, spectroscopy and plasma probes in the Science Education Laboratory under the mentorship of Science Education's Andrew Zwicker and Arturo Dominguez, and Jeremiah Williams, an assistant professor of physics at Wittenberg University. 



Dalila Martinez Mollina, a physics professor at the University of Mexico, works on her results.



Daniel Rosenberg, left, a lecturer at Harvard University, compares notes with Marcus Alfred, an associate professor of physics and astronomy at Howard University as Arturo Dominguez looks on.

ServiceNow Update

Telecommunications requests will now be managed by the ServiceNow IT ticketing system (help.pppl.gov).

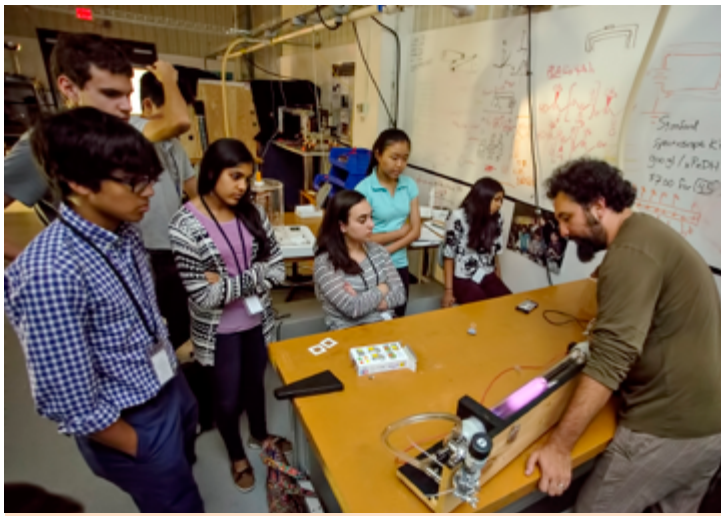
Telecommunications requests for phones, voicemail, radios, pagers, mobile devices, loaner cell phones, audio conferencing subscriptions and calling cards should be submitted via the ServiceNow web interface ticketing system rather than email.

Use the new ServiceNow system when you need telecommunications repair service, office phone moves, mobile phone rate plan changes and general assistance.


The Telecommunications office will also begin to provide telecommunications information and forms to support users on the SN system.

Switching to ServiceNow for telecommunications services will boost efficiency and improve service.

If you have any questions or concerns, contact Bill Bryan at x3435.



High school interns in Science Education laboratory

Ten high school students are taking part in research projects through a summer internship that ends Aug. 14 at the Laboratory. Some of the interns watch physicist Arturo Dominguez, of the Science Education Department, perform a plasma experiment in the Science Education Laboratory. Charles Gentile, Eliot Fiebush, Robert Kaita, Andrew Zwicker, Sophia Gershman, and Dominguez serve as advisors. 

From left to right: Ryan Catalano, Daniel Perry, Brandon May Swetha Subramaniam, Lara Balick, Vivian Qiang, Shailaja (Shaila) Humane, and Arturo Dominguez. Not shown: Matthew Fromm, Zachary Kaplan, and Nikhil Ramesh.

Volunteers needed for Boy Scout STEM Merit Badge Fair



PPPL will host its second annual STEM Merit Badge Fair for some 350 Boy Scouts from Central New Jersey on Oct. 3. The event will feature hands-on activities to help Boy Scouts earn badges in one or two of 17 different subjects including robotics, engineering, electronics, sustainability, fire safety, and nuclear science.

Organizers need numerous scientists, engineers, and subject matter experts to volunteer to work on lesson plans for specific merit badges and to serve as technical experts at the event itself. The group also needs numerous general volunteers to help with traffic control, check-in, refreshments, and other logistics.

Please register as soon as possible to volunteer. We are looking for PPPL and Princeton scientists, engineers and subject matter experts to work in partnership with registered merit

badge counselors to develop a lesson plan and activities for the specific merit badges selected. Counselors and Princeton experts will jointly identify the prerequisite requirements for Scouts to complete in advance, and will specify the demonstrations and/or hands-on activities to be completed at the Fair so that Scouts can earn the selected badges on October 3. When PPPL first hosted this event in 2013, approximately 350 Boy Scouts participated in 15 different subject areas, one of which is shown above. We are also in need of general volunteers to help with traffic control, check-in, refreshments and other event logistics. Please use the link below to register as a volunteer and indicate your subject area preferences.

The 2015 STEM Merit Badge Fair volunteer sign-up form is online at <http://tinyurl.com/PPPLSTEM-2015>, so that organizers can begin registering Scouts for the event.

Contact Rob Sheneman, rshenema@pppl.gov, with any questions.



BREAKFAST 7 a.m. • 10 a.m.
 CONTINENTAL BREAKFAST 10 a.m. • 11:30 a.m.
 LUNCH 11:30 a.m. • 1:30 p.m.
 SNACK SERVICE until 2:30 p.m.

	Monday July 27	Tuesday July 28	Wednesday July 29	Thursday July 30	Friday July 31
COMMAND PERFORMANCE Chef's Feature	Ota-Ya Sushi	Vegetable Fried Rice served with Eggrolls & Dumplings	COMMAND PERFORMANCE Carla's Specialty Ravioli Bar	Carved Caribbean Pork Loin served with Mango Salsa & Wild Rice	Outdoor BBQ Hot Dogs, Hamburgers, Chicken, Potato Salad, Macaroni & Cheese, Corn on the Cob, Watermelon, Beverage
Early Riser	Bacon, Cheddar Cheese Omelet Wrap	2 Eggs served with Hash Brown Casserole	Raisin Bread French Toast	Chocolate Banana Pancakes	Broccoli Cheddar Breakfast Pita Pizza
Country Kettle	Italian Wedding Soup	Curried Cauliflower	Beef Noodle	Tomato Bisque	Manhattan Clam Chowder
Grille Special	Beef BBQ Nacho Sub	Ham, Bacon & Cheddar on a Biscuit Smothered with Sausage Gravy served with Home Fries	Popcorn Shrimp Po' Boy	Turkey Burger with Avocado and Bacon	Roast Turkey, Avocado & Bacon Grilled on Texas Toast
Deli Special	Egg Salad, Avocado on Whole Grain Bread with Lettuce & Tomato	Marinated Flank Steak & Portobello Mushrooms served over Tossed Salad with Green Goddess Dressing	Slice Pork on French Bread with Pickled Slaw	Tuna Club with Hard Cooked Egg, Lettuce & Tomato	Pesto Chicken Salad Croissant
Panini	Italian Sausage, Fresh Mozzarella, Grilled Peppers, Onions & Mushrooms on an Asiago Cheese Roll	Fried Fish & Slaw Wrap with Tartar Sauce	Chicken Cheddar Quesadilla	Veggie Nachos	Roast Beef & Cheddar on an Onion Roll

	Monday August 3	Tuesday August 4	Wednesday August 5	Thursday August 6	Friday August 7
COMMAND PERFORMANCE Chef's Feature	Swedish Meatballs served Over Egg Noodles	Whole Wheat Penne Pasta with Portobello Mushroom, Asparagus, Cherry Tomatoes, Garlic & Oil served with Garlic Breadstick	Fried Chicken with Macaroni & Cheese	Rigatoni a la Vodka with Prosciutto & Peas served with Garlic Knots	Orange Glazed Salmon with Vegetable Couscous
Early Riser	Blueberry Pancakes served with Sausage	French Toast with Bacon	2 Eggs any style with Smothered Hash Browns	Banana French Toast	Sausage, Egg & Cheese Croissant
Country Kettle	Pasta Fagioli	French Onion	Minestrone	Sausage Lentil	Summer Squash & Corn Chowder
Grille Special	Grilled Beef Torpedo with Chimichurri Sauce	Kielbasa & Sauerkraut Torpedo with Fried Pierogies	Grilled Salmon Sandwich	Buffalo Chicken Wings served with Blue Cheese Dressing & Celery Sticks	Chicken Caesar Salad served with Garlic Texas Toast
Deli Special	Falafel	Roast Beef with Smoked Gouda Cheese on Kaiser	Knockwurst & Sauerkraut on Dark Rye served with German Potato Salad	Lobster Roll	Chicken Sliders with Buffalo Ranch Dressing served with 3-Bean Salad
Panini	Open-Faced Tuna Melt on English Muffin	Chef Salad Wrap	Smoked Pulled Chicken on a Kaiser Roll	Balsamic Grilled Veggie Wrap served with Pesto Potato Salad	Roast Beef & Provolone Torpedo au Jus

MENU SUBJECT TO CHANGE WITHOUT NOTICE

Menu Item is in keeping with American Heart Association (AHA) and U.S. Department of Agriculture (USDA) guidelines.

VEGETARIAN OPTION

WEEKLY

Editor: **Jeanne Jackson DeVoe** ♦ Layout and graphic design: **Kyle Palmer**
 Photography: **Elle Starkman** ♦ Science Editor: **John Greenwald** ♦ Webmaster: **Chris Cane**

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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/>.