PPPL PRINCETON PLASMA PHYSICS LABORATORY
A Collaborative National Center for Fusion & Plasma Research
U.S. DEPARTMENT OF ENERGY
WEEKLY
NOVEMBER 4, 2013

At PPPL THIS WEEK

MONDAY, NOV. 4

United Way Campaign begins

Open Enrollment (until Nov. 15)

WED. - FRI., NOV. 6 - 8

PPPL Advisory Committee Meeting

WEDNESDAY, NOV. 6

Health Fair at PPPL
10 a.m. - 2 p.m. ◆ LSB Lobby
11 a.m. Presentation ◆ MBG Aud

PPPL Colloquium
4:15 p.m. ◆ MBG Auditorium
Robot Bees
Noah Jafferis, Harvard University

UPCOMING EVENTS

November 11–15
55th Annual Meeting of the APS Division of Plasma Physics
Denver

November 14
America Recycles Day at PPPL
10 a.m. - 1:30 p.m. ◆ LSB Lobby

November 20
PPPL Colloquium
4:15 p.m. ◆ MBG Auditorium
Cybersecurity
Ed Felten, Princeton University

November 21
PPPL United Way Bake Sale
8 a.m. ◆ LSB Lobby

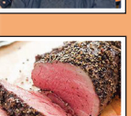
November 21
PPPL United Way Presentation
9:30 a.m. ◆ MBG Auditorium

November 28-29
Lab closed
Thanksgiving Holiday

INSIDE...

ARD Fashion Show .. pages 4

Max Planck Photo ... page 4



Cafe@PPPL Menu ... page 6

The partnership continues:

Princeton University will manage PPPL through 2018

By Jeanne Jackson DeVoe

PPPL's 61-year relationship with Princeton University is secure for the next four years after the U.S. Department of Energy signed a contract extension last week for the University to continue managing the Laboratory through 2018.

The new contract signed on Oct. 28 comes well before the end of March deadline and reflects the fact that PPPL and the University have met all of their contracted obligations to the DOE in operating PPPL, especially regarding the Laboratory's mission to further research to develop magnetic fusion as a viable energy source.

"This is a good news story, particularly for the stability of the Laboratory," said Maria Dikeakos, Department of Energy Site Manager. "It reinforces our long-standing relationship and our interest in continuing fusion research at PPPL."

Dikeakos said the formal approval needed for the contract extension had to be touched by many hands in the Department and credited the hard work of the staff in her office, which oversees the contract, to run it through many steps and reviews seamlessly. "There's a lot of work that goes into it from the Site Office," she said. "There's a lot of attention and scrutiny over how we manage our contracts up through the Secretary's office."

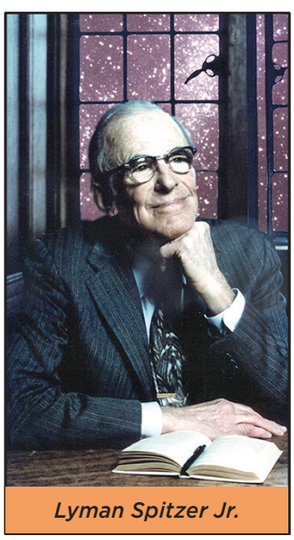
Princeton University and PPPL earned each of the four years included in the four-year extension to the five-year contract by performing well for each of the past four years. The contract will extend the previous five-year contract that began in 2009 and will end in March of 2014.

continued on page 5

Celebrating Lyman Spitzer, the father of PPPL and the Hubble Space Telescope

By John Greenwald

Princeton astrophysicist Lyman Spitzer Jr. (1914-1997) was among the 20th Century's most visionary scientists. His major influences range from founding the Princeton Plasma Physics Laboratory (PPPL) and its quest for fusion energy, to inspiring the development of the Hubble Space Telescope and its images of the far corners of the universe.



Lyman Spitzer Jr.

To honor Spitzer's achievements, some 60 scientists from around the world gathered at Princeton University Oct. 18-20 for a 100th birthday celebration of the pioneering physicist. The event, sponsored by the Princeton Department of Astrophysical Sciences and hosted by Princeton astrophysicist and department chair David Spergel, ranged from personal reminiscences of Spitzer the man to discussions of the latest developments in the fields of fusion, astrophysics and laboratory plasma science that he heavily influenced.

Spitzer was daring in both science and life. An avid skier and mountain climber, he once scaled a Gothic-style tower on the University campus. He was known for his discipline and unfailing politeness. "He was a very, very nice person, very reserved, very directed and very brilliant," recalled Russell Kulsrud, an emeritus Princeton professor and retired PPPL physicist who joined Spitzer's fusion project in 1954 after it began life as "Project Matterhorn" in 1951.

continued on page 2

Spitzer Celebration

continued from page 1

Spitzer displayed his prescience early on. As a young member of the Yale University faculty, he published a seminal paper in 1946 that called for putting a telescope into space to reveal far clearer images of distant objects than ground-based telescopes could create. This was more than a decade before the first orbiting satellite.

Dramatic expansion

A year later, at age 33, Spitzer became chairman of the Astrophysical Sciences Department at Princeton, from which he had earned his doctorate degree. Working with fellow astrophysicist Martin Schwarzschild, Spitzer led a dramatic expansion of Princeton's role as a center of astronomical research. He also initiated study of the "interstellar medium," the gas and dust from which new stars are formed, and thereby laid the foundation for another scientific field.

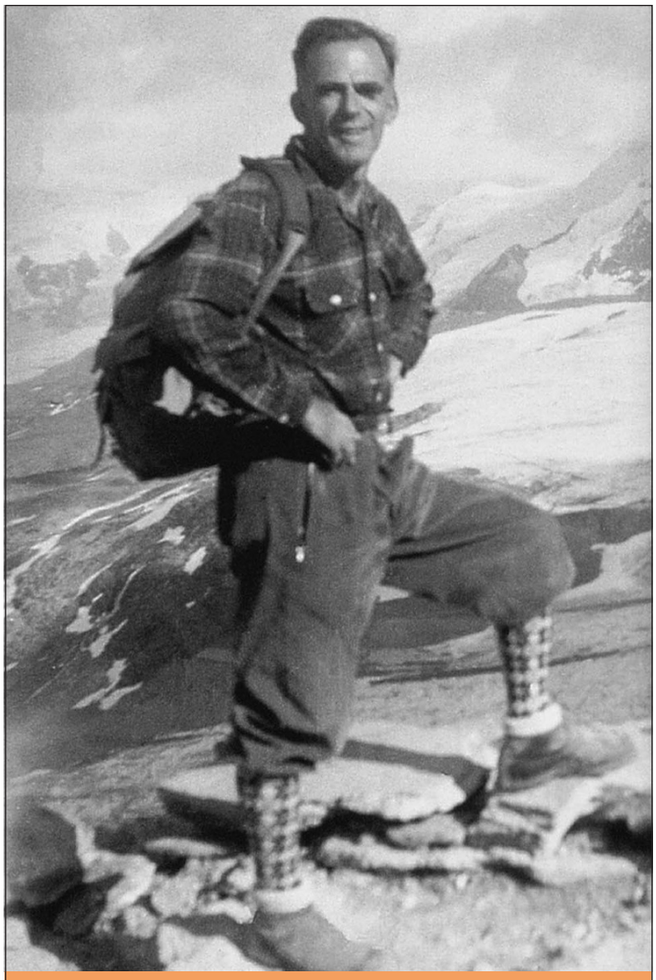
During a now-legendary ski trip to Aspen, Colo., in March, 1951, Spitzer conceived of a project to create fusion power. Having read that an Argentine scientist had made striking progress toward achieving fusion energy — a report that proved unfounded — Spitzer envisioned a process for confining hot, charged plasma gas inside magnetic fields in a figure-eight shaped device that came to be called a "stellarator."

Spitzer launched his project a few months later in a former rabbit hutch. The government classified the site since it also housed a nuclear weapons program that Princeton physicist John Wheeler led. Spitzer's section was code-named "Matterhorn S" and Wheeler's "Matterhorn B." Washington declassified the site in 1958 after the weapons program ended, and Project Matterhorn became PPPL in 1961.

Those early years posed numerous challenges for Spitzer and his crew. One came from physicist Edward Teller, the father of the hydrogen bomb, who warned during a meeting in the Princeton Gun Club near the rabbit hutch that Spitzer's stellarator couldn't confine plasma within the machine's magnetic field lines. Attempting to do so, said Teller, would be like trying to hold together a blob of jelly with rubber bands.

"Very large vision"

Pondering this challenge, Spitzer reconfigured the magnets to better control the plasma. His solution called for twisting the coils that produced the magnetic field lines into a helical rather than a circular form. He had earlier considered a huge experimental device that would have measured 500 feet around. "Lyman always had a very large vision about what you could do," said Kulsrud, who worked on the team that helped Spitzer redesign the magnetic confinement.



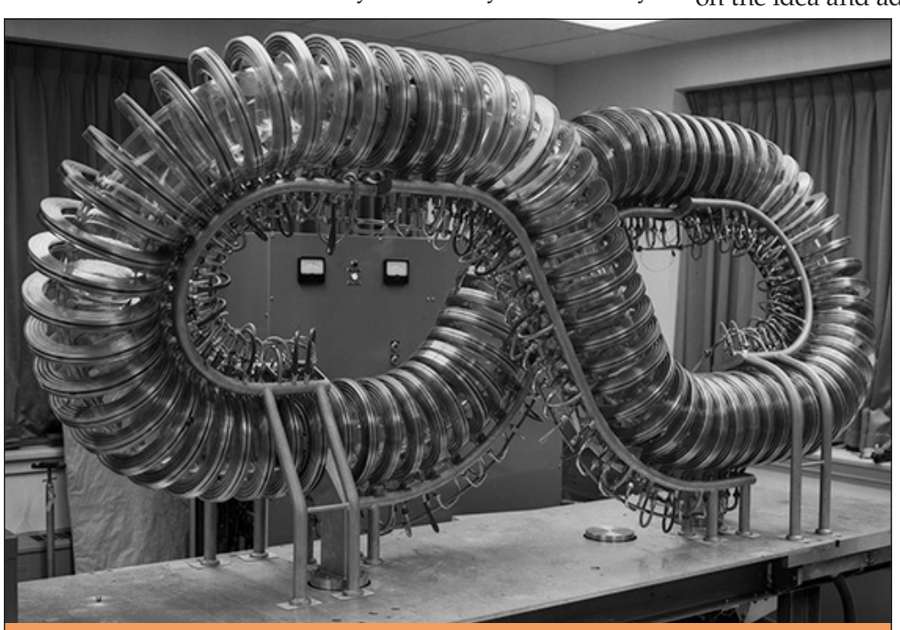
Lyman Spitzer Jr. was an avid mountaineer. His love for the challenging sport led to the name "Project Matterhorn" for the forerunner of PPPL.

In 1961 Spitzer handed the directorship of PPPL to physicist Melvin Gottlieb, under whom the Laboratory began in 1969 to focus on a donut-shaped magnetic device called a tokamak — now the world's most widely used type of experimental fusion facility. Spitzer continued to oversee scientific research at PPPL until 1966, when he turned away from fusion to concentrate on the design for an orbiting observatory to study ultraviolet light. This design became the basis for the National Aeronautics and Space Administration's (NASA) Copernicus satellite.

All the while Spitzer served as the driving force for the development of a large space telescope. He tirelessly worked on the idea and advocated it to members of Congress and the scientific community throughout the 1960s and 1970s.

His work bore fruit in 1990 when NASA launched the Hubble telescope. It continues to orbit some 350 miles above the Earth and to transmit stunningly clear photos of celestial objects as near as the planets in our solar system and as far as the earliest galaxies in the cosmos.

NASA paid special tribute to Spitzer in 2003 when it launched what it called the Spitzer Space Telescope on a mission to orbit the sun. This observatory became the first to directly spot light from planets outside the solar system — a fitting discovery for a telescope named in honor of a far-sighted scientist who opened new frontiers.

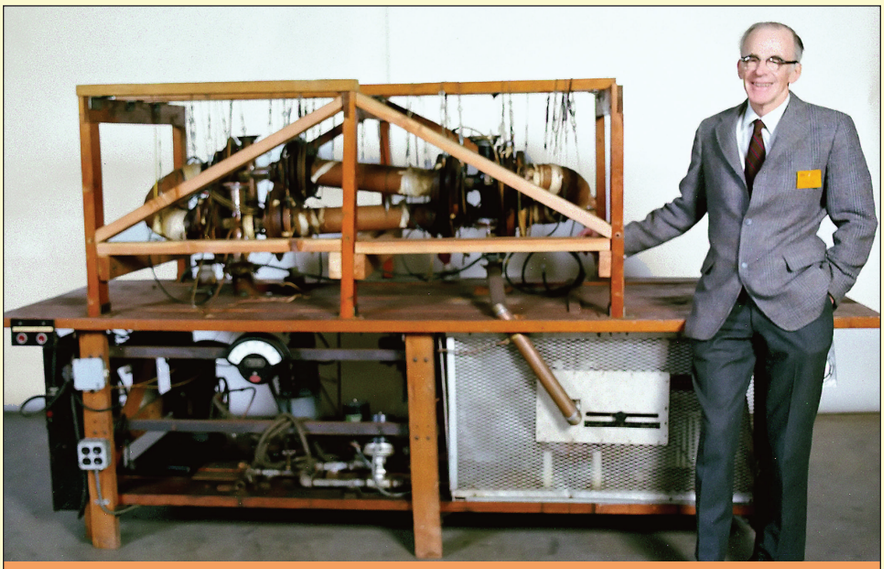


A figure eight-shaped early stellarator.

more photos on page 3

Spitzer Celebration

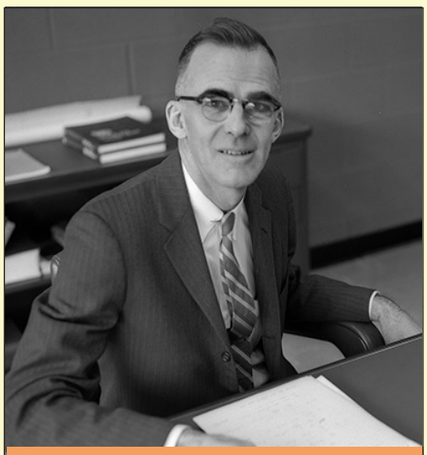
continued from page 2



Lyman Spitzer Jr. with the Model A Stellarator.

Four PPPL directors, clockwise from top left; Spitzer, Melvin Gottlieb, Ron Davidson and Harold Furth.

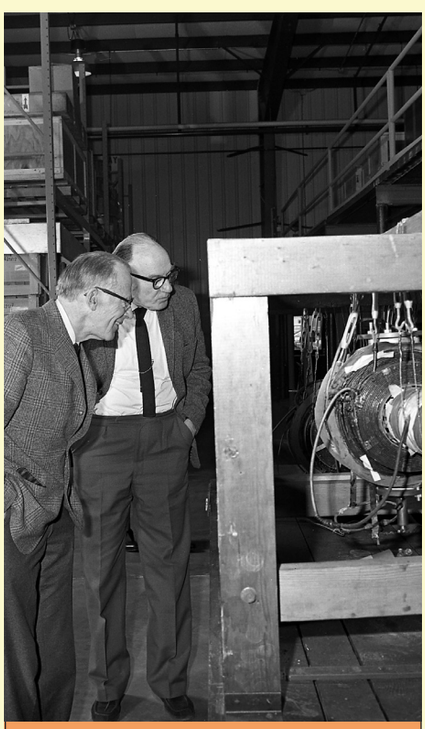
Spitzer demonstrates a plasma glow discharge for his grandchildren.



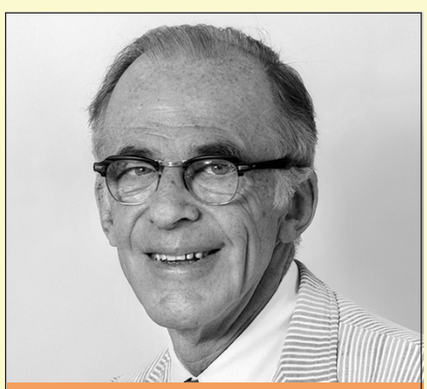
Spitzer

Spitzer with Gottlieb.

Spitzer with a model of the Space Shuttle.



Spitzer, left, and Gottlieb inspect an early stellarator.



Spitzer

MPPC gathering held at PPPL and Princeton

Members of the Max Planck/Princeton Center for Plasma Physics (MPPC) gathered Oct. 28-Nov. 1 for two days of workshops at PPPL and a three-day general meeting in the Princeton Center for Theoretical Science on the Princeton main campus. The MPPC, formed in March 2012 as a virtual facility, combines the research capabilities of the Princeton Department of Astrophysical Sciences and PPPL with the institutes for plasma physics, astrophysics and solar system research that are part of Germany's Max Planck Society. Participants in the virtual facility are shown here in the Princeton Center for Theoretical Science.

"Trashy" fashion show highlights America Recycles Day Nov. 14

PPPL's celebration of America Recycles Day on Nov. 14 will have what could be PPPL's first fashion show featuring dresses that can only be described as "trashy".

The event will feature a display of dresses that are made out of recyclable or compostable materials at PPPL. Building and Grounds supervisor Margaret Kevin-King has created three dresses: a mini dress and a longer dress made of newspaper, office paper, sticky notes, cans, bottles and other recyclables showcasing single stream recycling; and a "bubble wrap ballgown" showcasing items recycled in the stockroom. Dana Eckstein has also created a couple of dresses, including an electronic media dress, made up mostly of CDs and a composting dress made out of compostable materials.

This year, the Green Team is asking staff members to "Show Your Recycling Spirit" by making creative and inspirational outfits with recyclable items or trash at the Lab. Bring your outfit to the LSB lobby on Nov. 14 by 9 a.m. to be part of the fashion show.

The dresses will be displayed in the lobby from 10:30 a.m. to 1 p.m. and staff members will vote on their favorite dress during the display. The winner will receive a $20 gift certificate.

In addition to the fashion show, America Recycles Day will feature vendors, give-aways and recycling information in the LSB Lobby and electronics recycling.

PPPL'ers can bring in electronic gadgets and equipment to the C Site Lower End Parking Lot Warehouse Access Door from 7:30 a.m. to 10 a.m. for collection by Unicor. Please contact Kyron Jones at ext. 3326 or Kevin-King at ext. 3653 for more information.

Dana Eckstein models her electronic media dress made out of CDs next to three dresses made out of recyclable materials at PPPL by Margaret Kevin-King, including the "bubble wrap ballgown" at left. The dresses and any other recyclable dresses created by PPPL'ers will be displayed in the LSB lobby for PPPL's America Recycles Day on Nov. 14.

New management contract

continued from page 1

Fifth year extension to 2019 likely

Based on this year's performance, the Lab is hopeful the contract will be amended early next year to add a fifth year through 2019. The additional year will be based on the DOE evaluation of PPPL's performance in Fiscal Year 2013, which will be completed in December.

"We've earned, and the true word is 'earned,' the right to continue as a contractor based upon the Laboratory's excellent performance," said John DeLooper, head of best practices and outreach, who worked on the contract with the DOE Site Office. "And this is just a formal documentation of that process."

Avoiding uncertainty

The new contract avoids the kind of uncertainty PPPL experienced in 2008 when the DOE required the contract to be rebid and Princeton University had to reapply for the contract, said DeLooper.

DeLooper recalled the huge effort required to bid for the contract and the three volumes of paperwork required that year. "The bottom line is we don't have to spend money and time defending the contract," said DeLooper.

The five-year extension means that the Laboratory will have plenty of time to prepare for the Departmental decision to either put the contract out for bid or extend the contract before 2019, said Kim Tafe, the lead contracting officer for the DOE Site Office, who oversees the current contract. This decision will be made by the Secretary of Energy.

The Laboratory cleared a major hurdle when it received approval as a Federally Funded Research and Development Center, known as an FFRDC, on Jan. 28 in an order signed by then Secretary of Energy Steven Chu just before he left office.

But while the extension of the contract ensures that the DOE will fund the Laboratory, it does not guarantee the level of the funding since the U.S. Congress is in charge of appropriations.

A partnership since 1951

Princeton University has managed the Laboratory since 1951 when the Laboratory first began (see Lyman Spitzer story, page 1). PPPL employees are University employees but while they are paid by the University, the funding for their paychecks comes from the DOE.

The contract includes incentives for PPPL and Princeton University in the form of performance fees. Under the contract, Princeton University will receive a performance fee of $1.86 million for each fiscal year from 2015 to 2018 and $930,000 for Fiscal year 2019. These fees are completely dependent on whether PPPL performs well in meeting its performance obligations under the contract.

A.J. Stewart Smith, Princeton's vice president for PPPL and the primary liaison between Princeton University and the Department of Energy, said the University invests more financial support in the Laboratory than the amount of the performance fee through contributions to the Director's non-contract fund, salary support for tenured faculty, tuition plans for employees' family members and other benefits and expenses that are not covered by the DOE contract.

Both the contract extension and the performance fees are based on annual grades PPPL and Princeton University, as PPPL's manager, receive on how well they are operating the Laboratory in a kind of year-end report card. The biggest consideration is whether PPPL is meeting several goals related to its research mission, Tafe said. "Everybody is here to support the scientists and the science," Tafe said. "The whole Laboratory can take credit for this as a team. They have all been a part of earning this every year."

"Substantial expectations"

The contract requires that PPPL must pursue collaborations with researchers in the United States and abroad. It states that, "DOE has substantial expectations of the Contractor in the areas of: program development and mission accomplishment; laboratory stewardship; and excellence in laboratory operations and financial operations."

Under those criteria, the Laboratory is expected to further DOE's mission "by providing world-class scientific research and advancing scientific knowledge." Those contributions include PPPL's research on the National Spherical Torus Experiment, which is completing a $94 million upgrade next year; contributions to the international ITER fusion experiment in Cadarache, France; as well as research into the use of stellarators in fusion research and research in theory and modeling at PPPL.

Safety is also a big factor in the evaluations and Smith said he has been impressed at PPPL's efforts to reinforce the safety culture at PPPL. "One of the main things that's encouraging is the real sensitivity that's emerged in the culture of safety and efficiency," he said.

He added that the progress of the NSTX upgrade (NSTX-U) has been key to PPPL and the University meeting the criteria of the DOE contract. "The project is critical to the future of the Laboratory," he said, "and efforts are focused on safety, quality and schedule, in that order."

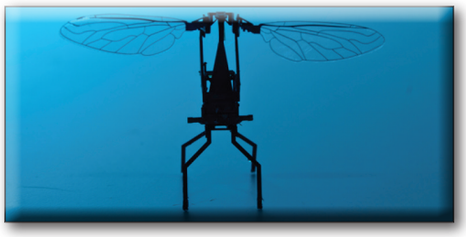
United Way Campaign kicks off Nov. 4

The 2013 Princeton University United Way Campaign will be held from Nov. 4 through Dec. 6. You are invited to PPPL's United Way presentation on Nov. 21 at 9:30 a.m. in the MBG auditorium. The guest speakers will be Herb Klein, the Chief Executive Officer of United Way of Greater Mercer County, and Eric Williams, who is not only an employee of United Way but also someone who benefited from their services. Sixteen parking spaces (three months each) will be raffled off and coffee will be served.

In order to increase participation, there will be a bake sale in the lobby on Nov. 21 starting at 8 a.m. The United Way committee is asking for volunteers to contribute by bringing in home-baked goods to be sold for $1 each. All proceeds will be donated to the United Way of Greater Mercer County with the University contributing 10 cents for every dollar that is raised. If you would like to participate, contact Kim Mastromarino (kmastrom@pppl.gov) by Nov. 15.

Please join us, through your financial support, in demonstrating that employees of PPPL support the people and programs where we live and work. To maximize efforts, the University will contribute 15 cents per dollar on top of current employee donations made through payroll deduction, and 10 cents per dollar on top of all other gifts. Donations of all amounts, $1 minimum, will be distributed among all programs within the United Way of Greater Mercer County. With a minimum contribution of $52, donations may be designated to support a specific program, to a United Way agency in your home community, or to any eligible charitable nonprofit agency of your choice. Information and pledge forms will be mailed to office mailboxes by Nov. 4.

COLLOQUIUM



Topic: Robot Bees

NOAH JAFFERIS
Harvard University

Wednesday, Nov. 6

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

America Recycles Day

- Giveaways
- Vendors
- Recycling Information
- Fashion Show
- Electronics Recycling

PPPL Princeton Plasma Physics Laboratory

LSB Lobby: November 14th, 2013
10 a.m. to 1:30 p.m.

Health Fair On Nov. 6

The PPPL Health Fair will be held this Wednesday Nov. 6 from 10 a.m. to 2 p.m. and representatives from various health care providers will be on hand to answer your questions.

Representatives of two free programs, My Health Coach and My Medical Expert, will give a presentation in the MBG auditorium at 11 a.m.

Open enrollment for health benefits will continue through Nov. 15. You should have received the 2014 Annual Benefits Open Enrollment packet at home by now. You can also view the packet online at www.princeton.edu/hr/oe.

From the PPPL Site Protection Division

Observe speed limits on PPPL grounds

The Site Protection Division would like to remind PPPL staff to observe posted speed limits on PPPL grounds, no matter what you are driving, whether it is a personal or government vehicle, a gator, a delivery vehicle, a motorcycle or any other vehicle.

When the speed limit is not posted, it is 15 miles per hour. Drivers should be careful when approaching a curve as there are many pedestrian crossings and several curves with obstructed views.

Please note that there is no passing on PPPL roadways unless a vehicle is stopped on the shoulder.

For more information, please click on Parking and Trafic Regulations at PPPL's internal website (www-local.pppl.gov).

Café at PPPL Menu

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

— MARK GAZO, Chef Manager

	MON. 4 NOV.	TUE. 5 NOV.	WED. 6 NOV.	THU. 7 NOV.	FRI. 8 NOV.
COMMAND PERFORMANCE CHEF'S FEATURE	 Marinated Grilled Chicken Breast with Roasted Corn & Black Bean Salsa served over Lime Rice	 Quinoa Vegetable Spanish Paella	 Carved Pepper Crusted Beef served with Wasabi Mashed Potatoes	 Apple & Raisin Stuffed Pork Loin served with Stuffing & Vegetable	 Seafood Newburg over Puff Pastry served with a Vegetable
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	Scrambled Eggs with Sausage Potato Casserole
COUNTRY KETTLE	Potato & Red Pepper Chowder	Curried Chicken & Vegetable with Rice	Tomato Soup	Bavarian Lentil Soup	Beef Barley
GRILLE SPECIAL	Fresh Hand-Crafted Beef Burger with Toppings and Fries	Turkey Burger with Pork Roll & Cheddar Cheese w/ Onion Rings	Fish Tacos served with Black Bean & Roasted Corn Salsa	Ultimate Chicken Cheesesteak served with Fries	Veggie Burger with Blue Cheese & Spinach on Whole Grain Roll
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 on Focaccia Bread	Chipotle Chicken with Avocado, Onion, Tomato & Honey
PANINI	BBQ Pulled Pork on a Kaiser Roll with Firecracker Slaw	Fried Flounder, Pepperjack, Tomato & Sauce on Ciabatta	Grilled Hawaiian Cordon Bleu on Ciabatta	Caprese with Fresh Mozzarella, Tomato and Basil	Italian Meatball Sub with Peppers & Onions
NEW! 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	Chicken Parm Patty Sandwich with Fries & 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/.