

Calendar of Events

APRIL 1-15

Green stockroom contest
(See page 6)

TUESDAY, APRIL 12

Laboratory Management Review
8:30 a.m.-12 p.m.

WEDNESDAY, APRIL 13

PPPL Colloquium
4:15 p.m. ♦ MBG Auditorium
[Inherently Risky Designs? The
History of Soviet Nuclear Reactors
and the Notion of Safety](#)
Professor Sonja Schmid, Virginia Tech

FRIDAY, APRIL 15

Lab-wide Cleanup

SATURDAY, APRIL 16

Obscure Day Tour
1-3:30 p.m.

SUNDAY, APRIL 17

Communiversy ArtsFest
1-6 p.m. ♦ Princeton University/
Princeton
Volunteers needed! (See page 4)

UPCOMING

TUESDAY, APRIL 19

Earth Day Cleanup
10:30 a.m.
Pizza lunch for volunteers!

WEDNESDAY, APRIL 20

Unicor Electronics Recycling
7:30-10 a.m. ♦ Upper parking lot

**Earth Week colloquium on
climate change**
4:15 p.m. ♦ MBG Auditorium
Dell Anderson, NYU

INSIDE

Bike Share Expansion 3

New Employees 3

Communiversy ArtsFest 4

Lab Cleanup Day 5

Avatar in Japan 5

Robotics Coaches Needed 6

Earth Week 6

Colloquium 7

Menu 7

McComas finds new way to reach for the stars as Princeton University vice president for PPPL

By Jeanne Jackson DeVoe

As a space plasma physicist working on NASA research missions, David McComas gives people a succinct, half-joking job description: “I discover the secrets of the universe.” Now as the new Princeton University vice president for PPPL, McComas said he will add, “And I’m going to help save the world.”

“I really do think that fusion energy is about saving the world,” McComas said. “We are burning fossil fuels and doing horrible things to the environment for our children and their children. When we have fusion energy you can imagine undoing some of that horrible environmental damage, making potable water available to everyone and solving food shortages and other crises around the world. You need this abundant, safe, clean energy source and the only one out there is fusion.”



David McComas, new Princeton University vice president for PPPL, left, with A.J. Stewart Smith, who retired from the position last week, during a tour of the NSTX-U last month.

[continued on page 2](#)

New computer cluster speeds up PPPL’s gold-standard TRANSP code

By John Greenwald

Worldwide users of TRANSP, the premier software code developed and housed at PPPL for analyzing fusion experiments, can now get results of their research up to 10 times faster. Enabling this improvement is a new high-performance computer cluster that the Laboratory installed in its computer center last October.

“The runs are much quicker now,” said Paul Henderson, the head of systems and networking operations who purchased the new equipment. “The previous hardware was about seven years old” — ancient for computers.

[continued on page 4](#)

David McComas

continued from page 1

McComas started at Princeton on March 25 and became the VP for PPPL on April 4. He will work half time at PPPL and half time as a professor in Princeton University's Department of Astrophysical Sciences.

"I am thoroughly delighted that the University has recruited Dave as the VP for PPPL," said Stewart Prager, the director of PPPL. "Dave brings a powerhouse of capabilities to the position—experience with large projects, strategic planning, interactions with federal agencies. And he brings the invaluable perspective he has gained as a leading space scientist."

Smith, a member of Princeton University's faculty and staff for nearly 50 years and the first dean for research, said farewell to PPPL last week. "I have fallen in love with PPPL and hope to help the Lab behind the scenes " he said, "while continuing my collaborations and advisory roles at CERN, SNOLAB (an underground physics laboratory in Canada), the LSST (the Large Synoptic Survey Telescope in Chile) and the Istituto Nazionale di Fisica Nucleare (National Institute or Nuclear Physics) in Italy. And certainly not least, my wife and I are looking forward to more time to enjoy life, our grandchildren, and our friends around the world."

An unexpected opportunity

McComas wasn't looking for a job when he got a phone call last summer from David Spergel, chair of the University's Department of Astrophysical Sciences. He had worked with Spergel when Spergel was chair of the National Academy of Science's Space Studies Board and McComas was on the NASA Advisory Council, chairing its Science Committee. Spergel asked McComas if he would be interested in a position opening up at Princeton to replace A.J. Stewart Smith. Smith, the first University vice president for PPPL, announced his April 2016 retirement last July to allow time for a national search for a successor.

His first reaction, McComas said, was to tell Spergel he was happy in his leadership position in the Southwest Research Institute's Space Science and Engineering Division, where he had worked for 15 years. But when Spergel described the job in more detail, he changed his mind. "It was so great! They were looking for someone who was a plasma physicist – I'm a space plasma physicist. They were looking for someone who has a leadership background and is also an academic, and also knows the DOE (Department of Energy) complex and environment. It was like the job description was written for me," he said.

McComas will continue his work with NASA and may develop a NASA program at Princeton and PPPL. He is currently the principal investigator on two extended NASA Heliophysics System Observatory missions: the Interstellar Boundary Explorer (IBEX) and two spacecraft called the Two Wide-Angle Imaging Neutral Atoms Spectrometers (TWINS). IBEX studies the heliospheric boundary or edge of our solar system, while the TWINS mission studies the magnetosphere, the area surrounding Earth dominated by Earth's magnetic field. McComas also heads research using complex instrumentation aboard several other spacecraft, including the New Horizons spacecraft, which just flew by Pluto last summer, and Juno, which will study Jupiter after arriving this coming July. McComas has written more than 550 scientific papers, generating more than 22,000 citations, based on his research. He holds six patents.

McComas is also principal investigator on the Integrated Science Investigation of the Sun (ISOIS) instrument suite on Solar Probe Plus. The device will explore the Sun's outer

atmosphere or corona in space and is expected to launch in 2018. In July, NASA Administrator Gen. Charles F. Bolden presented McComas with an Exceptional Public Service Medal for his work with the NASA Advisory Council and as chair of the Council's Science Committee.

Such an illustrious career could not be foretold by a childhood swathed in challenges. The physicist is open about the difficulties he had in school due to dyslexia as a youngster growing up in Milwaukee, Wisconsin. He didn't learn to read until fourth grade and was called "slow" by other kids. But he was skilled in anything mechanical, and was always inventing things. When his father told him to get a job when McComas was a high school sophomore, he went into business for himself: He taught himself how to grind stones and make jewelry, and he established a thriving business – so much so that a downtown jeweler offered him a full-time job if he would forgo college.

"Fell in love" with physics

At the same time, McComas said, he "fell in love" with physics after reading Isaac Asimov's book, "Understanding Physics." "I found physics to be the most obvious and natural thing I had ever seen. I guess it's the way my brain is wired," he said. "It just seemed so intuitive. This is how the world works. It's not magic."

The Massachusetts Institute of Technology in Cambridge, Massachusetts, accepted McComas – probably based on his entrepreneurial skills, he said. But it was his fine motor skills honed in jewelry-making that got him a job doing delicate assembly work on a new type of X-ray telescope on a sounding rocket. That experience would lead to his future career.

After graduating from MIT with a bachelor's degree in physics in 1980, McComas and his girlfriend (later wife) traveled across country in a Volkswagen microbus. McComas's former professor, the well-known mathematician and philosopher Gian-Carlo Rota, urged him to stop in New Mexico

and interview for a job at Los Alamos National Laboratory. He got the job and began working with space instruments and doing research. He left Los Alamos for a brief stint at the University of California, Los Angeles, where he did 18 months of course work for his Ph.D. Despite working full-time for the next year and a half, McComas completed his doctorate in a record 34 months. "I was a man on a mission," he said. He spent 20 years at Los Alamos, where he became founding director of the Center for Space Science and Exploration and the NASA program manager for the entire laboratory.

Established space plasma physics program

When McComas moved to the Southwest Research Institute in Texas, he became more involved in academics. He helped establish a joint graduate program in space plasma physics with the University of Texas, San Antonio. McComas team-taught several classes and helped create a graduate-level lab class in which students worked with real space instrument hardware – something he might like to do here at Princeton and the Laboratory, he said.

While there is much interest in establishing a space plasma program at the University, McComas said, he would consider taking on that task only after establishing himself in the vice president's position and studying the feasibility of such a program. In the meantime, he will continue his research with graduate students and post-docs and plans to do laboratory work at PPPL.

[continued on page 3](#)

David McComas

continued from page 2


McComas is a board member of Dyslexic Advantage, an organization that emphasizes the positive aspects of dyslexia. He is a black belt in jujitsu and enjoys working on cars and remodeling his own homes. He has three adult sons who live all over the country. The family reunites at a 50-acre piece of land in the Colorado mountains where they plan to build a cabin. McComas and his sons stay in a camper on the spot, without Internet or cellphone service, and spend their days working outdoors.

Meetings in Washington, D.C.

While McComas has only officially been on the job for a few days, he has already thrown himself into the position with help from his predecessor. Four days after the University announced his appointment in early February, McComas was off to Washington, D.C., with Smith. They met several top DOE officials, including Cherry Murray, director of the DOE's Office of Science; Pat Dehmer, deputy director for Science Programs in the Office of Science; and Ed Synakowski, associate director of science for Fusion Energy Sciences.

McComas said he appreciates Smith's help. "It's been absolutely fabulous getting to meet and know Stew and he's been a huge help in telling me about the issues," he said. He added that he has also been impressed with the "dedicated and excellent" leadership team at PPPL.

Smith said he also enjoyed getting to know McComas and is confident "the Lab is in good hands." McComas will build on Smith's efforts to work with PPPL and the DOE to "ensure that PPPL remains the leading U.S. laboratory for fusion and plasma science, and maintains its strong presence and influence on the world fusion scene," Smith said.

Strengthening the ties between the University and the Laboratory is a vital part of his mission, McComas said. "I'm very serious about that part of the job," he said. "I think fusion energy is important to the future of mankind. It seems to me we tie into the big picture of what the University is all about, which is not only training students, but also tackling the big issues facing humanity. I hope and plan to take this to the fore." 

University expands bike-sharing program to Forrestal Campus

Princeton University is making it easier for those who would rather hop on a bike for transportation than drive a car. The University has expanded its affordable bike-share program to offer 70 bikes at 15 different locations, including a stop on the Forrestal Campus near PPPL.

The new bike station nearby PPPL is at 500 Forrestal Road, between Route 1 and Campus Road, about a mile's walking distance from PPPL. It is a stop on the Tiger Transit Bus that goes to PPPL.

Bike riders age 18 and up can rent the bikes through Zagster, a bike-share company based in Cambridge, Massachusetts by going online or downloading a Zagster app. Users pay a \$20 one-time fee that allows bike rentals for up to two hours for free, with additional hours costing \$2 per hour. More information and a map of locations are on the [Zagster website](#).


To rent a bike, riders log into their account on the app and enter the ID number of the bike they want to use. The app gives them an access code for the lockbox on the back of each bike that has the key for the bike lock. The code can be

used throughout the ride and the rental ends when the bike is returned to another bike-share station. The program does not rent helmets.

Town officials in Princeton plan to work with the University to install bike-sharing stations in the community this summer. The project is supported by a \$192,000 federal Congestion Mitigation and Air Quality Improvement grant allocated by the New Jersey Department of Transportation.

[The University's Transportation & Parking Services website](#) has information for bike riders that includes a bike map, information on bike repair, and other information.

Registered riders can use Zagster anywhere it is available, which includes San Francisco, Los Angeles, Atlanta, and Chicago. [A map of national locations is available here](#).

May is National Bike Month and PPPL plans to host its third-annual Bike Challenge to encourage PPPLers to bike to work and at home. Stay tuned for more details. 

PPPL Welcomes New Employees!



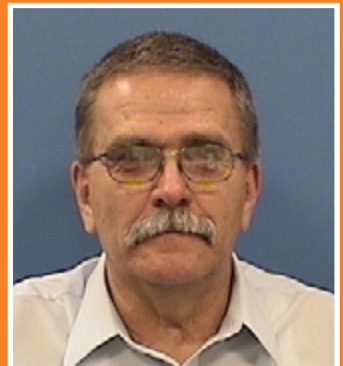
MICHAEL CHEN
Procurement specialist
Business Operations



DOUGLAS DOWNING
Electronics engineer
Engineering



AL MARK
Cost and price analyst
Business Operations



DEAN PETERSON
Procurement specialist
Business Operations

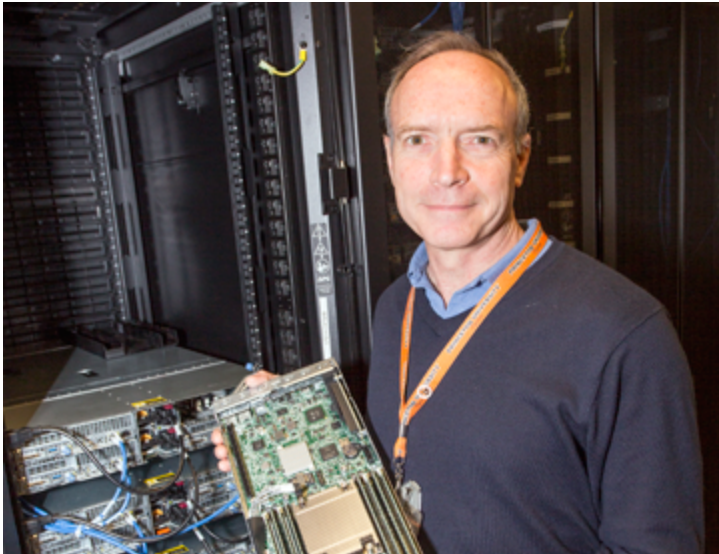
TRANSP code

continued from page 1

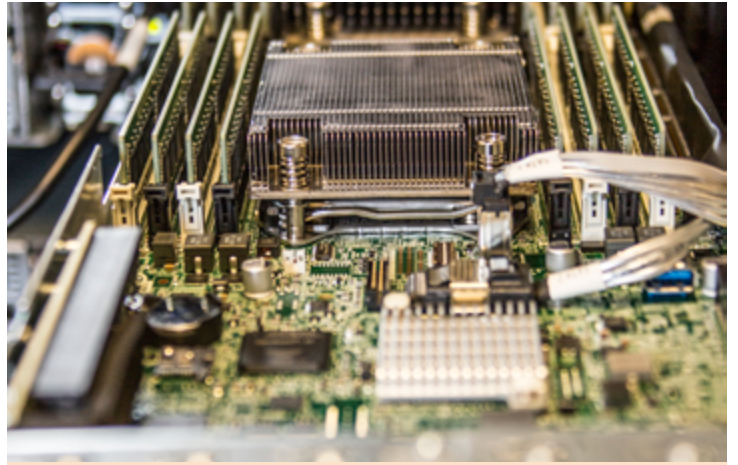
The new \$200,000 cluster, powered by Intel Haswell microchips, is a far more powerful system. Each of its 32 servers holds 32 computer cores for a total of 1,024 cores to process TRANSP software. The previous system had more servers but just 170 cores.

The compact new hardware is highly energy efficient and free from the frequent breakdowns that plagued the previous system. “We lost about a third of the old cluster before the upgrade,” said Principal Research Physicist Stan Kaye, who helps oversee TRANSP operations.

Physicist Francesca Poli, a major user of TRANSP, employs the software to simulate experiments. “Having so much computing power is very helpful,” she said. “It greatly speeds things up. We can now simulate a 500-second ITER discharge in about five hours, down from about 20 hours.”



Paul Henderson, head of systems and network engineering, displays a high-density server from the new high-performance computer cluster that executes TRANSP software.



Closeup view of the high-density server.

Researchers throughout the world rely on TRANSP, which was originally developed in the 1970s by the late Douglas McCune, to interpret their magnetic fusion energy experiments and plan new ones. Many institutions have added their own applications to the continually updated code, which is currently being adapted for use by ITER, the international facility under construction in France.

Users log on to TRANSP through a secure access system called “Globus.” They then upload data from experiments into the software, which has the ability to analyze one-second long National Spherical Torus Experiment-Upgrade discharges in less than an hour. The increased number of cores “enables us to trace particles in parallel rather than serially,” Kaye said. A PPPL support group addresses any problems that users may experience.

The expanded core capacity is particularly useful for a TRANSP module called NUBEAM, which computes how the injection of neutral beam atoms affects the plasma that fuels fusion experiments. “NUBEAM can account for up to eighty percent of the compute time,” Kaye noted.

For Henderson, the new high-performance hardware supports the Laboratory’s core collaborative mission. “These new servers were very needed,” he said. “They are a big improvement.” 📷

Volunteer for PPPL’s booth at Communiversiity April 17

The Communiversiity Festival of the Arts on Sunday, April 17 from 1 p.m. to 6 p.m. is a great opportunity to inform the public about the great research and public programs taking place at PPPL and have fun.

The event, which is produced by the Arts Council of Princeton with help from Princeton University students and support from the town of Princeton, attracts thousands of visitors and features more than 200 artists, crafters, merchants, organizations, and Princeton University-affiliated groups. We need volunteers to do plasma demos, answer questions about our research, and interact with the public. Please contact Jeanne Jackson DeVoe, jjackson@pppl.gov/ ext. 2757 to volunteer. More information about Communiversiity is available at [the Arts Council of Princeton website](#).

PPPL spring cleaning day is April 15

By Jeanne Jackson DeVoe

PPPLers need to pitch in to give their offices, laboratories and work areas a thorough spring cleaning and pitch out all those piles of paper and junk cluttering up the Laboratory, offices, cabinets and hallways.

That's the intent of an official Lab Cleanup Day on April 15 being organized by John DeLooper, acting deputy director for operations.

PPPLers should also get rid of equipment that is no longer in use. Electronics, furniture, computers and other large items must be excessed. Go to <http://material-control.pppl.gov/TransferandExcessForm.pdf> for a form, or contact Kyrone Jones, kjones@pppl.gov, ext. 3326, for help with excess property.

Chemicals, paints, solvents and other potentially hazardous material must be discarded by the Environmental Services



"This is a common problem," DeLooper said. "We're all busy trying to do the work of the Laboratory and this is an opportunity for us to stop for a little bit and just take care of the housekeeping. If you want to do it 15 minutes every day for the next week that's OK too, but we want to see a noticeable improvement in the cleanliness and the clutter. That's the goal." He added: "You're setting yourself up for an accident if you have a cluttered workspace."

The cleanup is also a necessary step to clear out office space and allow room for visitors as well as the students arriving at PPPL this summer, DeLooper said.

Most paper, including paper records, can be tossed into recycling and replaced with electronic records. (Check Procedure Gen-023 Records Management <http://bp.pppl.gov/procedures/gen023.pdf> for details). Contact Margaret Kevin-King, mking@pppl.gov, ext. 3652, if you need additional recycling bins.

Division's Waste Management Group. Procedures are available at <http://bp.pppl.gov/procedures/ewm001.pdf>

Contact Rob Sheneman, head of the Environmental Services Division, rshenema@pppl.gov, ext. 3392, for more information.

DeLooper said he plans to ask for bags of recycled material and waste to be weighed or counted at the end of the day to measure the success of the cleanup. Remember that while some trash has to go the landfill, recycling is preferable for waste disposal and that employees should recycle unwanted items as much as possible.

PPPLers can also volunteer to take part in the annual Earth Week grounds cleanup on April 19 at 10:30 a.m., with a pizza lunch to follow. ([See story on page 6](#)). 📍



Avatar the guide dog poses in front of Eye Mate in Tokyo with the guide dog training center's president Tokao Shiyoya and his daughter Akemi.

Avatar the guide dog takes residence in Japan

The 22-month-old Labrador arrived in Japan April 1 to become part of a breeding program for Eye Mate in Tokyo and will live with a local family. Avatar was popular at PPPL where he often came to work with Robert Sheneman, whose family fostered him for a year and a half as part of his early guide dog training. Sheneman is often accompanied to work these days by his family's latest foster puppy, Pixie, a black Labrador. 📍

Robotics coaches needed for all-girls robotics teams

PPPL's Science Education team is looking for volunteer coaches for a new all-girls FIRST Lego League Robotics team (ages 9 to 13) and the new FIRST Tech Challenge Team (ages 13 to 18) being organized in collaboration with the YWCA-Princeton.

The teams will meet throughout the fall semester and there are lots of events throughout the spring and summer to engage everyone. The program welcomes volunteers with all kinds of skills. This includes not only those with engineering, robotics, and building skills, but also volunteers with the ability to mentor students and help build leadership, teamwork, research, and social engagement skills. Coaching the teams is a rewarding experience that is, as one of the teams' founders put it, "the hardest fun you'll ever have!"

Please call Shannon Greco ASAP to volunteer:
sgreco@pppl.gov, 609-243-2208.

Help keep PPPL green!

Send in Green Machine award nominations & sign up for Earth Week cleanup!

The Green Team is still seeking nominations for the Green Machine awards! Please nominate a PPPL employee or a team that has helped keep PPPL green, including yourself! You can submit nominations by filling out an [online application form here](#) or contact Leanna Myer (lmyer@pppl.gov) for more information.

Please also volunteer to help out with PPPL's annual grounds cleanup on April 19 to help keep PPPL's grounds beautiful, get some exercise and fresh air, and enjoy a pizza lunch! [Please go here to sign up!](#)

The Green Machine awards will be held on April 27 at 11:30 a.m. and will be followed by a half-hour animated movie, "The Story of Stuff." There will be a sustainable fair with tables by vendors in the lobby from 10:30 a.m. to noon.

Other Earth Week activities include:

- A green stockroom contest: April 11 to 15: Any employee who purchases sustainable items will be automatically entered into a raffle. Items include: motion sensor power strips, rechargeable batteries and battery chargers, LED flashlights, and eco-friendly hand sanitizers.
- A special Earth Day Colloquium: Wednesday, April 20, at 4:15 p.m. in the MBG Auditorium featuring Dell Anderson, of New York University, who will discuss climate change.
- Unicorn electronics collection: Wednesday, April 20, from 7:30 a.m. to 10 a.m. at the lower parking lot in front of the warehouse or at the warehouse rollup door next to the firehouse if it is raining. [A list of items Unicorn accepts is here.](#)
- A possible Earth Day walk at the Mapleton Preserve along the D&R Canal. Stay tuned for details.

COLLOQUIUM

Inherently Risky Designs? The History of Soviet Nuclear Reactors and the Notion of Safety

Professor Sonja Schmid
Virginia Tech



Wednesday, April 13
4:15 p.m., M.B.G Auditorium, Lyman Spitzer Building

BROCK

MARK GAZO
Chef Manager



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 April 11	Tuesday April 12	Wednesday April 13	Thursday April 14	Friday April 15
COMMAND PERFORMANCE Chef's Feature	Chicken Parmesan served with Pasta and Garlic Bread	Cheese Ravioli in a Pink Vodka Sauce with Peas & Mushrooms	COMMAND PERFORMANCE Oriental Stir Fry	Meatloaf with Smashed Cilantro Potatoes, Roasted Carrots & Gravy	Seafood Stuffed Tilapia served with Rice & Vegetable
Early Riser	Chicken & Cheddar Omelet served with Hash Browns	Grilled Cheese French Toast with Bacon	Sausage Hash Brown Bake	Egg McMuffin with Ham served with Hash Browns	Sausage Gravy & Biscuits served with 2 Eggs any style
Country Kettle	Kielbasa Soup	Vegetable Chili	Chicken Rice	Minestrone	Beef Noodle
Grille Special	BURGERLICIOUS Beef in a Blanket Grilled Beef Burger with Cheddar Cheese, Bacon Blanket, Crispy Onion Straws, Dill Pickle Chips and Chipotle BBQ Sauce on a Brioche Roll (Available all week)	Cheddar & Bacon on Raisin Bread	Fish Taco with Pickled Slaw, Cilantro, Chipotle Sour Cream	Grilled Texas Toast with Prosciutto, Chicken, Swiss Cheese & Dijonnaise	Vegetarian Quesadilla
Deli Special	Egg Salad & Provolone with Arugula & Tomato on French Bread	Corned Beef with Swiss Cheese, Coleslaw, Russian Dressing on Rye	Italian Hoagie with Prosciutto, Capicola, Fresh Mozzarella, Lettuce, Tomato & Marinated Red Peppers	Tuna Club Sandwich with Hard-Cooked Egg	Ham Salad Croissant
Panini	Pork Roll & American Cheese on a Soft Roll served with Fries	Caprese Grilled Cheese Panini with Pesto Mayo, Fresh Mozzarella, Roasted Peppers, Fresh Basil & Tomato on Italian Bread	Turkey, Smoked Gouda, Avocado & Chipotle Mayo on Focaccia Bread	Portobello Parmesan Sandwich	Roast Beef with Bleu Cheese, Onion, & Tomato on Ciabatta Bread

MENU SUBJECT TO CHANGE WITHOUT NOTICE

VEGETARIAN OPTION

WEEKLY

Editor: **Jeanne Jackson DeVoe** ♦ Layout and graphic design: **Kyle Palmer**

Photography: **Elle Starkman** ♦ Science Editor: **John Greenwald** ♦ Webmaster: **Chris Cane**

The PPPL WEEKLY is published by the [PPPL Office of Communications](#) on Mondays throughout the year except for holidays.

DEADLINE for calendar item submissions is noon on WEDNESDAY. Other stories should be submitted no later than noon on TUESDAY.

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