

At PPPL THIS WEEK

WEDNESDAY, JUNE 24

Colloquium

4:15 p.m. ♦ MBG Auditorium
[External Propulsion and the Future of Space Access](#)

Dr. Dmitry Tselikhovich,
Escape Dynamics, Inc.

UPCOMING

FRIDAY, JULY 3

Lab closed for Independence Day holiday

WEDNESDAY, JULY 15

Annual Theory and Simulations of Disruptions in Tokamaks Workshop

FRIDAY, JULY 17

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

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Researchers correlate incidences of rheumatoid arthritis and giant cell arteritis with solar cycles

By John Greenwald

What began as a chat between husband and wife has evolved into an intriguing scientific discovery. The results, published in May in *BMJ* (formerly *British Medical Journal*) *Open*, show a “highly significant” correlation between periodic solar storms and incidences of rheumatoid arthritis (RA) and giant cell arteritis (GCA), two potentially debilitating autoimmune diseases. The findings by a rare collaboration of physicists and medical researchers suggest a relationship between the solar outbursts and the incidence of these diseases that could lead to preventive measures if a causal link can be established.

RA and GCA are autoimmune conditions in which the body mistakenly attacks its own organs and tissues. RA inflames and swells joints and can cause crippling damage if left untreated. In GCA, the autoimmune disease results in inflammation of the wall of arteries, leading to headaches, jaw pain, vision problems and even blindness in severe cases.

Inspiring this study were conversations between Simon Wing, a Johns Hopkins University physicist and first author of the paper, and his wife, Lisa Rider, deputy unit chief of the Environmental Autoimmunity Group at the National Institute of Environmental Health Sciences in the National Institutes of Health, and a coauthor. Rider spotted data from the Mayo Clinic in Rochester, Minnesota, showing that cases of RA and GCA followed close to 10-year cycles. “That got me curious,” Wing recalled. “Only a few things in nature have a periodicity of about 10-11 years and the solar cycle is one of them.”

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Stacia Zelick: New CIO comes to PPPL with a passion for research, a wealth of experience in IT, and a disco ball

By Jeanne Jackson DeVoe

Stacia Zelick, PPPL’s new chief information officer, brings years of experience in information technology to the job, along with a willingness to literally get her hands dirty. She also brings with her a disco ball for her office that has yet to be unpacked.

A friend gave Zelick the disco ball when she was at her first job and it has followed her from job to job ever since. She plans to install it and play music in her office once she has permanent quarters. (She is currently in a temporary office on the third floor). “Every once in a while you just have to unwind by singing and dancing it out,” Zelick said. “I love what I do and I do what I love. My management style is very open. People can come to me with anything and everything. That’s always what’s been given to me by my supervisors, colleagues and professors and I think I’m just paying it forward.”



Stacia Zelick

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Mayo Clinic collaboration

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Wing teamed with physicist Jay Johnson of the U.S. Department of Energy's Princeton Plasma Physics Laboratory, a long-time collaborator, to investigate further. When the physicists tracked the incidence of RA and GCA cases compiled by Mayo Clinic researchers, the results suggested "more than a coincidental connection," said Eric Matteson, chair of the division of rheumatology at the Mayo Clinic, and a coauthor. This work drew upon previous space physics research supported by the DOE Office of Science.

The findings found increased incidents of RA and GCA to be in periodic concert with the cycle of magnetic activity of the sun. During the solar cycle, dramatic changes that can affect space weather near Earth take place in the sun. At the solar maximum, for example, an increased number of outbursts called coronal mass ejections hurl millions of tons of magnetic and electrically charged plasma gas against the Earth's magnetosphere, the magnetic field that surrounds the planet. This contact whips up geomagnetic disturbances that can disrupt cell phone service, damage satellites and knock out power grids. More importantly, during the declining phase of the solar maximum high-speed streams develop in the solar wind that is made up of plasma that flows from the sun. These streams continuously buffet Earth's magnetosphere, producing enhanced geomagnetic activity at high Earth latitudes.


The research, which tracked correlations of the diseases with both geomagnetic activity and extreme ultraviolet (EUV) solar radiation, focused on cases recorded in Olmsted County, Minnesota, the home of the Mayo Clinic, over more than five decades. The physicists compared the data with indices of EUV radiation for the years 1950 through 2007 and indices of geomagnetic activity from 1966 through 2007. Included were all 207 cases of GCA and all 1,179 cases of RA occurring in Olmsted County during the periods and collected in a long-term study led by Sherine Gabriel, then of the Mayo Clinic and now dean of the Rutgers Robert Wood Johnson Medical School.

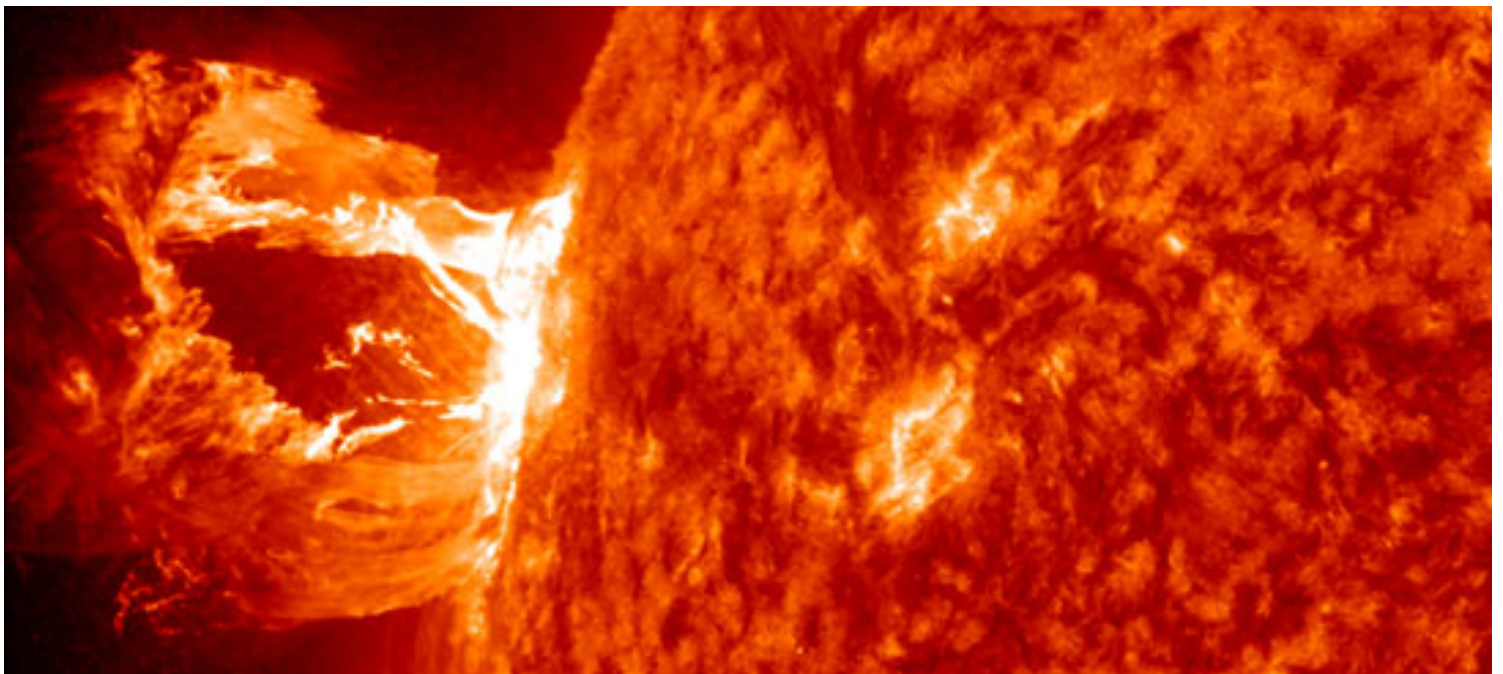
Correlations proved to be strongest between the diseases and geomagnetic activity. GCA incidence — defined as the number of new cases per capita per year in the county — regularly peaked within one year of the most intense

geomagnetic activity, while RA incidence fell to a minimum within one year of the least intense activity. Correlations with the EUV indices were seen to be less robust and showed a significantly longer response time.

The findings were consistent with previous studies of the geographic distribution of RA cases in the United States. Such research found a greater incidence of the disease in sections of the country that are more likely to be affected by geomagnetic activity. For example, the heaviest incidence lay along geographic latitudes on the East Coast that were below those on the West Coast. This asymmetry may reflect the fact that high *geomagnetic* latitudes — areas most subject to geomagnetic activity — swing lower on the East Coast than on the opposite side of the country. While Washington, D.C., lies just 1 degree farther north than San Francisco geographically, for example, the U.S. capital is 7 degrees farther north in terms of geomagnetic latitude.

Although the authors make no claim to a causal explanation for their findings, they identify five characteristics of the disease occurrence that are not obviously explained by any of the currently leading hypotheses. These include the east-west asymmetries of the RA and GCA outbreaks and the periodicities of the incidences in concert with the solar cycle. Among the possible causal pathways the authors consider are reduced production of the hormone melatonin, an anti-inflammatory mediator with immune-enhancing effects, and increased formation of free radicals in susceptible individuals. A study of 142 electrical power workers found that excretion of melatonin — a proxy used to estimate production of the hormone — was reduced by 21 percent on days with increased geomagnetic activity.

Confirming a causal link between outbreaks of RA and GCA and geomagnetic activity would be an important step towards developing strategies for mitigating the impact of the activity on susceptible individuals. These strategies could include relocating to lower latitudes and developing methods to counteract direct causal agents that may be controlled by geomagnetic activity. For now, say the authors, their findings warrant further investigations covering longer time periods, additional locations and other autoimmune diseases. 



Coronal mass ejection hurling plasma from the sun. (Photo courtesy of NASA)

New CIO

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Zelick, whose first name is pronounced “Stay-sha,” said she likes the fact that she will have the opportunity to get involved in day-to-day operations. In her previous job as director of Information Technology at Rutgers University-Newark, Zelick managed a budget of more than \$4 million and a staff of 26 full-time employees and 100 student employees. When her staff was busy helping students connect their computers to the network during moving-in weekend each fall, Zelick worked alongside them. “I love being hands-on,” Zelick said. “I never ask my staff to do anything I wouldn’t do and creating the team mentality in my department starts with me.”

Designed computing facilities

At Rutgers University - Newark, Zelick was in charge of several projects to enhance the campus’s computing services, infrastructure and national profile, some of which she designed herself. She created a \$350,000 expansion of the library computing facility that housed 100 state-of-the-art computers. She devised the campus’s first-ever high-performance computing cluster for researchers — a \$1.5 million project that included a \$700,000 80-node computing cluster made possible through a grant from the New Jersey Equipment Leasing Fund — and a \$350,000 data center enhancement project.

Zelick’s wealth of experience, particularly related to research, made her the top candidate for the position, said Adam Cohen, PPPL’s deputy director for operations. “Stacia comes to PPPL with over 15 years of experience as an information technology professional, most recently at Rutgers. She brings vision and strategic leadership to our information technology efforts,” Cohen said. “IT continues to grow as a critical element for accomplishing our missions and running our organization, and her efforts and those of her organization will be vital for this Lab’s success. I look forward to working with her and watching her enthusiastic approach have a positive impact Lab-wide!”

Zelick fills the position last held by Steve Baumgartner, who retired on April 1, 2014. Jim Hirsch and Bill Davis led the department for a year until Adam Cohen took over the position as interim CIO in April for one month.

A computer whiz from an early age

A native of Union, New Jersey, Zelick was the first kid on her block to get an early personal computer and her friends flocked to see it. She has been fascinated by computers ever since. “I like challenges, and it was challenging to have a computer when no one else had one and to be the one to figure it all out – and fix whatever you break,” she said. “I like putting pieces of puzzles together so it was fun for me. I’m such a nerd!”

Zelick earned a B.A. in computer information systems from a joint program at Rutgers University and the New Jersey Institute of Technology. She went on to get an MBA in management information systems from Montclair State University and a PhD in organization and management, with a specialization in information technology management, from Capella University, a Minnesota-based institution that delivers most of its education online.

Zelick’s father, Ray Zelick, lives with her in their two-family house. They currently reside in Vernon, New Jersey, which is 10 minutes from Warwick, New York, and 90 miles from PPPL. She plans to relocate soon. She and her father have five rescue dogs. She is an athlete who enjoys kickboxing and outdoor activities like running and skiing. She and her father, who grew up in Pittsburgh, are football fans who root for the Pittsburgh Steelers.

Began career in higher education at UMDNJ

Zelick began her career in higher education as a user support specialist at the University of Medicine and Dentistry of New Jersey. She later became the manager of the Computer Assisted Learning Environment (CALE) at Montclair State University and managed the teaching and learning computing facilities throughout the campus. Two years later, she became director of Technical Support Services at the university, a position she held for eight years. She led the Technology Solutions Center, including the teaching and computing facilities, the university helpdesk, desktop support, repair, and audiovisual services. She also taught IT courses in Montclair’s School of Business.

Zelick went on to become IT manager at Kent State University, where she was executive director of Disaster Recovery, Infrastructure and Security for about one year before becoming executive director of Service Management at the Ohio school. She and her team completed a number of projects, including designing a disaster recovery and business continuity strategy, completing the university’s first successful disaster recovery exercise, and completing an email migration of 7,000 users to a cloud email solution.

Zelick looks forward to leading PPPL’s IT department and shaping the department’s strategic plan for the coming years. “That’s huge because I’ve always been part of the process but I’ve never been the one to lead the process,” she said.

She is especially enthusiastic about supporting PPPL’s research goals. “The research being done here is critical, and to have an impact on that research with the services provided through ITD is priceless,” she said. “I know I can make a difference here.” 📍

PPPL'ers show off their cars

Several PPPL'ers in the Engineering Department showed off their cars and vehicles at a car show during the annual Engineering picnic on June 17. 📷



A group examines the engine of a black 1994 Corvette owned by Steve Raftopoulos. From left to right: Vadislav Vekselman, Mark Swanek, Raftopoulos, and Pete Titus.



Photographer Elle Starkman tries out a BRP Can-Am Spyder roadster owned by Jeff Bennett. (Photo by Andy Carpe)



Margaret Boateng examines the interior of a 1934 Series 40 Buick owned by Pete Titus.



Michael Gomez takes the wheel, with Steve Raftopoulos in the passenger seat, of a 1980 MBG Triumph Spitfire 1500. Gomez bought the car new as a college student and sold it in 1988. The car was eventually given to a museum in the Detroit area that was closing and Gomez found the car again last fall and drove it home as a project to do with his son.

Tour for University's Office of Audit & Compliance staff



PPPL Deputy Director for Operations Adam Cohen, left, gave a tour of PPPL to 11 members of Princeton University's Office of Audit & Compliance staff on June 17.

A bike team picnic



Some of the 40 members of PPPL's bike team enjoyed a picnic near Carnegie Lake in Princeton on June 12 to celebrate PPPL's successful Bike Challenge Month in May, in which PPPL was #291 of 1,348 groups participating. Back row left to right: Joe Bartzack, Laurie Bagley, Kathleen Lukazik, Mark Sibilia, Theresa Gillars, and Mike Zarnstorff. Middle row: Jeanne Jackson DeVoe, Rob Sheneman, Chris Cane. Front row: Bob Horner, Morgan Styer.

2015 Annual PPPL Bluefishing Trip Aboard the 80' Suzie Girl

Date: Friday August 21st 2015

Departure: 5pm SHARP!!!

Location: Belmar Marina Hwy.
35, Belmar, NJ 07719

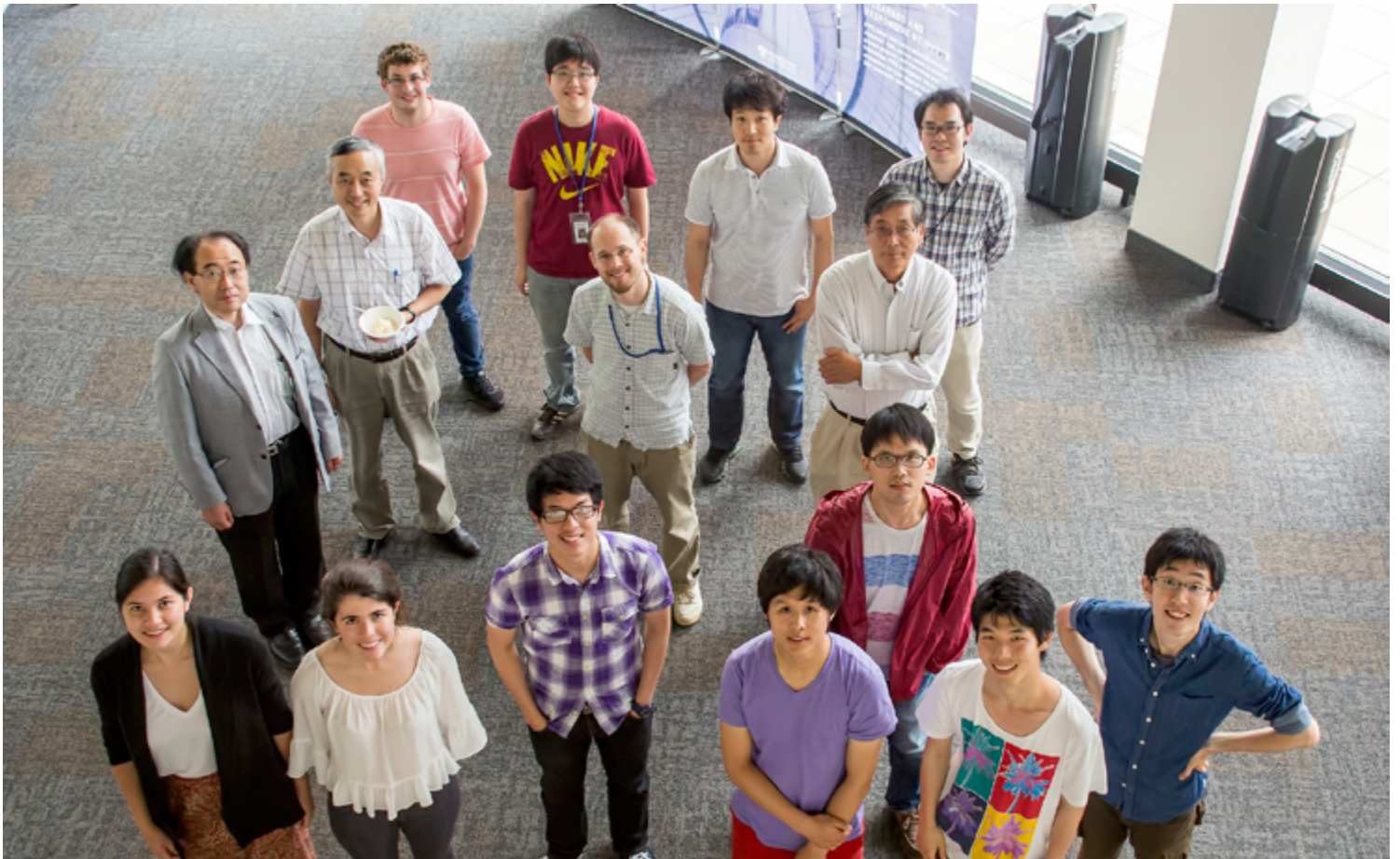
Cost: \$80 Per person ALL
INCLUSIVE. Cost includes
everything—rods, bait, fish
cleaning, food, beverages,
prizes, etc. All you need to do
is show up!



**Money due by Friday July 25th,
NO REFUNDS**

Contact Andy Carpe, ext. 2118, acarpe@pppl.gov,
or Bob Tucker Jr., ext. 3190, rltucker@pppl.gov.

Ice-cream social for students in new exchange program with the University of Tokyo

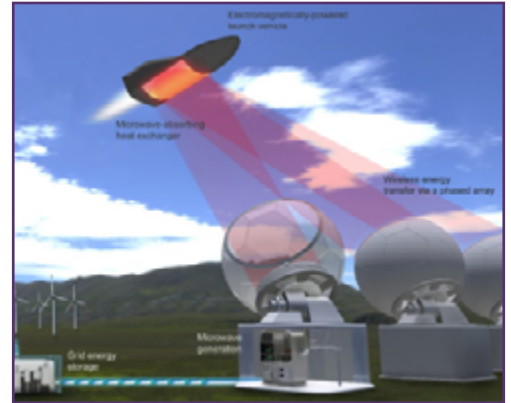


Physicist Masaaki Yamada hosted an ice-cream social for students and staff participating in a new exchange program in plasma physics between the University of Tokyo and Princeton University/PPPL. Four undergraduates from Princeton and four from the University of Tokyo took two weeks of classes at Princeton University. The four Princeton undergraduates then flew to Japan to do research in the University of Tokyo's laboratories for six weeks, while the four students from Tokyo will remain at PPPL for six weeks of research.

COLLOQUIUM

External Propulsion and the Future of Space Access

Dr. Dmitriy Tselikhovich
Escape Dynamics, Inc.



Wednesday, June 24

4:15 p.m. (coffee/tea at 4 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 June 22	Tuesday June 23	Wednesday June 24	Thursday June 25	Friday June 26
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	CELEBRITY CHEF PAULA DEAN Southern Pot Luck with Country Ham and Fried Chicken	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**

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/>.