

At PPPL
THIS WEEK

MON. - WED., NOVEMBER 19 - 21

Toki Conference - Japan

MONDAY, NOVEMBER 19

Andlinger Center Seminar

4:30 p.m. ♦ Main Campus,
Computer Science 104

[Oil Prices, Exhaustible Resources
and Economic Growth](#)

James Hamilton, UC, San Diego

THURSDAY, NOVEMBER 22



FRIDAY, NOVEMBER 22

Lab Closed - Thanksgiving

UPCOMING EVENTS

November 28
PPPL Colloquium
4:15 p.m. ♦ MBG Auditorium

Engineering Challenges and
Updates on ITER
Wayne T. Reiersen, U.S. ITER
Refreshments at 4 p.m. in the LSB Lobby

November 28
Open Enrollment ends
(Date extended due to Hurricane
Sandy.)

INSIDE...

- **Iron Lotus**
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A rock n' roll chef comes to PPPL

By Jeanne Jackson DeVoe

PPPPL's new chef doesn't belt out songs behind the counter. He's too busy planning meals and keeping things running in the cafeteria. But on weekends, he offers a menu of classic rock songs as a singer at local restaurants.

Gazo is a rock musician turned chef who is putting out his first CD this year. He comes to PPPL with nearly 20 years of restaurant experience.

Hurricane Sandy postponed his start-date at PPPL but he began his first day on Oct. 31 when the Laboratory had a delayed opening. It took him two and a half hours to get to work that day and only about half the employees were in the building due to the storm and the large number of PPPLers attending the American Physical Society Division of Plasma Physics conference in Providence, R.I.

After 10 years working in an Italian restaurant and another seven years working in the cafeteria of a large office building, Gazo said he's enjoying having a job where he gets to know everyone and can do more cooking.

"I wanted to get back to cooking," he said. "I love the fact that I'm out on the line serving people for two hours a day, getting feedback."

Gazo said he's even OK with negative feedback because it gives him a sense of what people like to eat. So far, he said, PPPLers seem to gravitate towards comfort food with decent portions. "I get the sense they want to eat and for what they're paying I'd like to give it to them," he said.

He replaces Keith Leder who is moving to a new job after taking a couple of weeks off to get married and go on a honeymoon. Leder's wedding was postponed because the venue

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Mark Gazo

International Atomic Energy Agency holds conference on fusion roadmap

By John Greenwald

Seventy participants from 16 countries and international groups gathered at the University of California at Los Angeles under the auspices of the International Atomic Energy Agency (IAEA) in mid-October to formulate the early stages of a roadmap for the worldwide magnetic fusion program. This "IAEA DEMO Programme Workshop," the first in an annual series inaugurated this year by the IAEA, focused on key issues for demonstrating electricity generation from fusion on an industrial scale, and identified opportunities for international collaboration.

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Iron Lotus

The Russian journal SCIENCE First Hand published these striking “Iron Lotus” photos by PPPL photographer Elle Starkman in its November issue in a photo essay called the “World as Viewed by Science.”

Features editor Ludmilla Belyaeva said she found the photos in Princeton University’s Art of Science Gallery 2011 and chose them because they are “interesting and visual.” The journal is a Russian popular science journal founded in 2004 by the Siberian branch of the Russian Academy of Sciences. It is published in both Russian and English and Starkman’s photos will be published in the English version early next year.



SCIENCE First Hand
journal - No. 4 (46), 2012

Железный ЛОТОС

На странной маслянистой поверхности плавает удивительный цветок, похожий на фантастический металлический лотос... Кажется бы, все ясно: цветок – твердое вещество в резервуаре – жидкость, пусть и необычная на вид. Но в действительности и в том, и другом случае мы имеем дело с одним и тем же материалом. Речь идет о так называемом феррофлюиде – жидкости, смешанной с крохотными металлическими частичками, которые намагничиваются в присутствии магнитного поля.

Будет ли феррофлюид жидким или твердым, зависит от того, воздействует ли на него магнитное поле – именно оно заставляет наночастицы складываться в форме утыканного шипами цветка.

В нашем случае магнит помещен над резервуаром с феррофлюидом. Шипы образовавшегося «цветка» ориентированы строго вверх в центре



© Дж. Гринголд, Э. Старкман, 2012

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НАУКА В КАРТИНКАХ



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Starkman took the photos in 2011 while staff members from PPPL’s Science Education Department were demonstrating how a liquid metal called a ferrofluid responds to a magnet by transforming the liquid into a solid with a shape that resembles an iron lotus.

“I’m very excited that they made it all the way around the world,” Starkman said. “I’m still trying to comprehend that they found them in New Jersey.”

The photos were also picked up by the Wall Street Journal and CNN. It is not the first time Starkman’s photos have won acclaim. She has won numerous awards, including first prize in the Art in Science contest in 2005 and two of her photos were chosen for display at the Liberty Science Center.

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— Jeanne Jackson DeVoe

Iron lotus

continued from page 2

Используя несколько магнитов и меняя их расположение, из феррофлюида можно вырастить настоящие букеты удивительных железных лотосов

чани, где напряженность магнитного поля наиболее высока; по мере ослабления поля к краям блюдца они начинают все больше наклоняться и изгибаться. Если убрать магнит, то шпильки исчезнут, и феррофлюид вновь примет форму жидкости.

Такой удивительный способ визуализации магнитного поля в трех измерениях можно с успехом использовать в образовательных целях.

Открытие в 60-х гг. прошлого века, сегодня феррофлюиды широко применяются в электронике, космонавтике и медицине. Например, из намагниченных феррофлюидов создаются жидкие уплотнительные устройства, изолирующие вращающиеся оси в жестких дисках компьютеров, чтобы



Этот феррофлюид состоит из наночастиц, находящейся во взвешенном состоянии в маслообразной жидкости. Наночастицы содержат железо, поэтому они притягиваются к магниту, помещенному прямо над чашей с жидкостью

предохранить их от частиц извне, попадающих внутрь жесткого диска. Феррофлюиды могут также заглушать нежелательные вибрации в акустических системах. А в медицине феррофлюиды используются для создания четких изображений при обследованиях с помощью ядерно-магнитного резонанса.

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НАУКА В КАРТИНКАХ



PPPL photographer
Elle Starkman

A ferrofluid is a liquid mixed with small metallic particles that can become magnetized in the presence of a magnetic field. Ferrofluids are used in electronics, spacecraft, and medicine, but are also a fascinating way to visualize a magnetic field in three dimensions. A ferrofluid is known for having properties of two different states of matter: liquid and solid. Whether a ferrofluid is a liquid or a solid depends upon whether a magnetic field is present. Unlike a flower floating on the surface of a pond (where the flower is a solid and the water a liquid), with a ferrofluid the “flower” and the “water” are the same material. — John Greenwald

Rock n' roll chef

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where he was going to hold his reception had no electricity, Gazo said.

Began his career as a rock musician

Gazo grew up in Manville, N.J. He began his career as a rock musician and made a pretty good living for several years. He toured with well-known artists such as Aerosmith, The Black Crowes and Taylor Dayne and performed in New York and New Jersey with groups such as The Montana Mining Company, Ricochet and Radio Radio.

But by 1990, it was harder to make ends meet working as a musician and Gazo decided to pursue a career in the food industry. After graduating from the New York Restaurant School, he first worked at a French restaurant called Le Petite Chateau in Bernardsville for two years. He went on to work at an Italian restaurant called T.J.'s Trattoria in Pennington where he was the head chef for 10 years until 2010.

The downside of working at a restaurant, Gazo said, was the long hours and a schedule that left him little time for relationships. "The restaurant business is crazy," Gazo said.

So his next step was to get a job with Brock & Co. where he worked at New Jersey Manufacturer's Insurance Company in West Trenton, which has 2,000 employees. He liked the job but it involved more managing than cooking and Gazo said he wanted to get back into the kitchen.

Each day, Gazo and his wife Barbra, wake up at 3 a.m. Mark leaves for work close to 4 a.m. and Barbra exercises and walks the

Photo courtesy of Mark Gazo



dog before leaving for Newark at 6 a.m. They try to go to sleep at around 8 p.m. Since he's started his new job at PPPL, he's been arriving at work by 5 a.m. so he can learn the ins and outs of his new job.

Michael Viola, head of Facilities and Site Services Division, gives Gazo two thumbs up. "He's wonderful," he said. "I just had lunch and it was good."

Producing a CD of original music

Gazo plays gigs at New Jersey restaurants and is currently playing at Luigi's Rancho restaurant in Belvidere. He also plays bass with the Jim Winder band for a musical version of John Bunyan's Christian allegory "Pilgrim's Progress."

He took a break from Brock for a few years to take courses in audio engineering and he's working on producing his first CD of original music through his studio IAM Productions. He describes his project as a Christian rock opera about the life of Jesus Christ that is tentatively titled, "The Show." In the few hours of spare time left, he swims a few days a week for exercise.

Mark and Barbra Gazo, who have been married for 20 years, live in Frenchtown with their dog Bones, a Labrador mix. Barbra works in the advertising department at the New Jersey Law Journal and is finishing up college with the aim of going to law school. Gazo says he experiments with whipping up unusual meals on weekends because his wife doesn't cook.

He says he's looking forward to getting to work on a new menu that incorporates some of his specialty pastas. "I can create pasta out of anything," he says half-seriously. "I can create pasta out of air." He says he's happy to be at PPPL. "I love it," he said. "This is exactly what I was looking for and so far everybody's been wonderful." 🍷

Fusion roadmap

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Such demonstration projects are collectively known as DEMO. "Many countries are developing their own plans for DEMO," said Hutch Neilson, who directs advanced projects at PPPL and chaired the four-day workshop. "But while the plans may vary from nation to nation, resolving DEMO scientific and technical issues and facility requirements is of common interest, and there are substantial benefits to sharing knowledge."

All parties to the workshop foresaw the need to build a facility that would mark the final step before construction of a commercial fusion power station. Some envisioned at least one intermediate fusion facility between ITER, the international project that is being built in Cadarache, France, and the final step. These intermediate devices could test processes ranging from trying out components in a fusion environment to breeding tritium to sustain fusion reactions.

Also discussed at the workshop were plans for facilities to develop materials that can stand up to long-term exposure to neutrons, the main product of fusion reactions and the source of the heat that will be used to generate electricity.

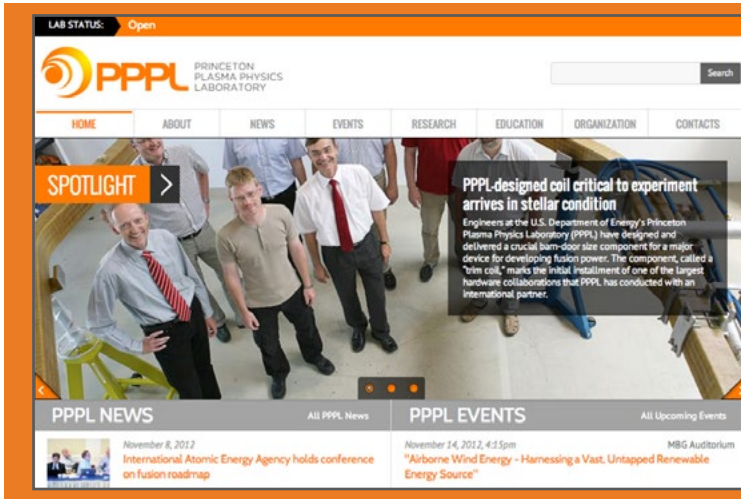


From left to right are Keeman Kim, National Fusion Research Institute, Korea; Ron Stambaugh, IAEA; Neilson; Dale Meade, retired deputy director of PPPL; Dennis Whyte, MIT; and Scott Willms, ITER.

(Photo courtesy of University of California at Los Angeles)

All such steps toward a DEMO remain tentative at present. "The pace at which various plans will go forward will become clearer over the next few years as plans mature and DEMO initiatives are considered by governments," Neilson said. "Modes of international collaboration will become clearer as well."

Workshop participants agreed to reconvene at IAEA headquarters in Vienna for the next annual meeting to be held in November or December, 2013. Proposed topics for the session include computer codes for designing fusion facilities; simulated scenarios for controlling plasma; and a continuation of the first workshop's discussion of methods for dealing with the heat that strikes the inner walls of fusion facilities. 🍷



Visit the **NEW**
PPPL WEBSITE
 now online at
www.pppl.gov

PPPL's colorful, comprehensive and easy to navigate website goes live on Nov. 12 after being fully redesigned.

HR Happenings

Open enrollment period extended due to Hurricane Sandy

Due to the impact of Hurricane Sandy on the University and the surrounding communities, the end date of the annual benefits open enrollment period is being extended to Wednesday, Nov. 28.

The new contribution maximums for the Retirement Savings Plan for 2013 are as follows:

- Under age 50: \$17,500
- Over age 50: \$23,000

You may elect these new maximums during the open enrollment period.

COLLOQUIUM

Engineering Challenges and Updates on ITER

WAYNE T. REIERSEN
 U.S. ITER

Next Week • Wednesday, November 28

4:15 p.m. (Coffee/Tea at 4 p.m.)
M.B. Gottlieb Auditorium, Lyman Spitzer Building



PPPL Café Menu

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

MONDAY NOV. 19

TUESDAY NOV. 20

WEDNESDAY NOV. 21

THURSDAY NOV. 22

FRIDAY NOV. 23

COMMAND PERFORMANCE
 CHEF'S FEATURE



FISH N' CHIPS WITH TARTAR SAUCE & VEG.



RIGATONI ALFREDO WITH GARLIC TOAST



TOP ROUND ROAST BEEF WITH BROWN RICE



Happy Thanksgiving

EARLY RISER	Banana Walnut Pancakes with Sausage
COUNTRY KETTLE	Cream of Potato
GRILLE SPECIAL	Cheddar and Pepperoni Chicken Cheese Steak with Fries
DELI SPECIAL	Turkey Ranchero Roll-Up with Horseradish Mayo
PANINI	The Ham and Swiss Griller

The XL Italian Meat and Cheese Omelet with Home Fries
Hearty Onion 🍅
Italian Hot Dog with Onion Rings
Southern Reuben
3 Cheese and Tomato

Sausage, Egg, Pepper, Onion, Potato, Cheddar and Salsa Burrito
Turkey Chili 🍅
Buffalo Chicken Sandwich on a Kaiser Roll with Fries
Tuna Nicoise on Brioche
Sicilian Grilled Chicken Parmesan

MENU SUBJECT TO CHANGE WITHOUT NOTICE

[CLICK HERE FOR A PRINTABLE WEEKLY MENU](#)

WEEKLY

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Comments: commteam@pppl.gov ♦ **PPPL WEEKLY** is archived on the web at: <http://www.pppl.gov/ppplweekly.cfm>