

Calendar of Events

THURSDAY, NOV. 12

PPPL Colloquium

4:00 p.m. ♦ MBG Auditorium

[W7-X Status Report](#)

Dr. Thomas Sunn Pedersen, Max Planck
Institute of Plasma Physics

UPCOMING

NOV. 16-20

**American Physical Society Division
of Plasma Physics conference**
Savannah, Georgia

TUESDAY, NOV. 17

Unicor Electronics Recycling

7:30-10 a.m. ♦ C Site Lower End
Parking Lot, Warehouse Access
Door Area

FRIDAY, NOV. 20

Public Tour

10 a.m.

tours@pppl.gov

TUESDAY, NOV. 24

PPPL Colloquium

2:30 p.m. ♦ MBG Auditorium

[DIII-D Recent Results and Future
Direction](#)

Dr. Richard Buttery, General Atomics

PPPL Colloquium

4:00 p.m. ♦ MBG Auditorium

[Sustainability Economics](#)

James Morris, Rutgers University

NOV. 30-DEC. 16

Holiday Food Drive

LSB Lobby

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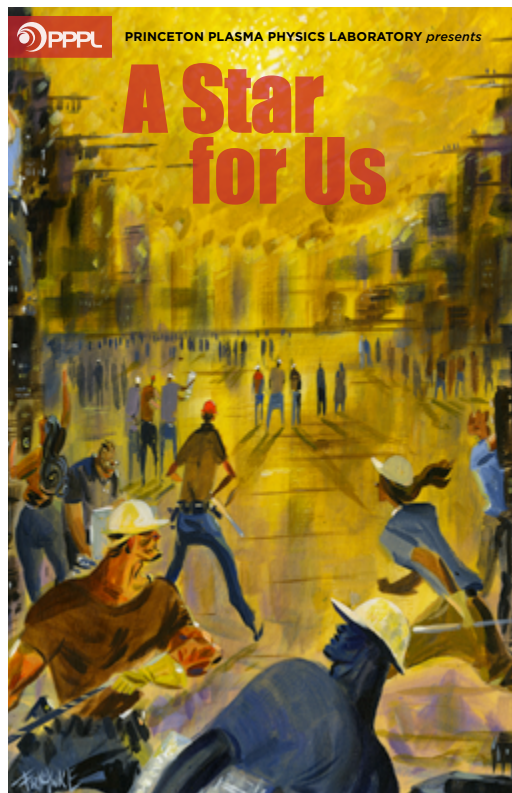
Menu **6**

Physicists are a new kind of superhero in comic book on fusion energy

By Jeanne Jackson DeVoe

A new comic book produced by PPPL entitled “A Star for Us” tells the story of the quest for fusion energy and PPPL’s role in that quest through dramatic and eye-catching images.

The glossy comic book, featuring graphics by comic book artist Frank Espinosa and text by Sajan Saini, a Princeton professor of writing, was distributed to PPPL staff last week. It will be handed out to tour groups, Science on Saturday lecture goers, students visiting the Laboratory and public events of all kinds. The comic book is



also available in a downloadable version on PPPL’s website at http://www.pppl.gov/sites/pppl/files/basic_pages/files/PPPL_AStarForUs_fusioncomic_download.pdf.

“I thought this was a terrific opportunity to really capture in evocative visuals a leading-edge national research program for this country,” said Saini, who holds a doctorate in materials science and engineering from MIT.

The 12-page comic book delves into fusion energy’s history and the technical challenges of “building a star” to generate electricity. It touches on the role of the National Spherical Torus Experiment (NSTX) and the more powerful and recently completed National Spherical Torus Experiment-Upgrade (NSTX-U) in achieving this goal.

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Concrete removal at C Site MG building begins as IOI projects moves forward

By Jeanne Jackson DeVoe

Work will begin this week to remove the concrete foundations in the C site MG building, which once held massive motor generators that powered experiments in the 1980s.

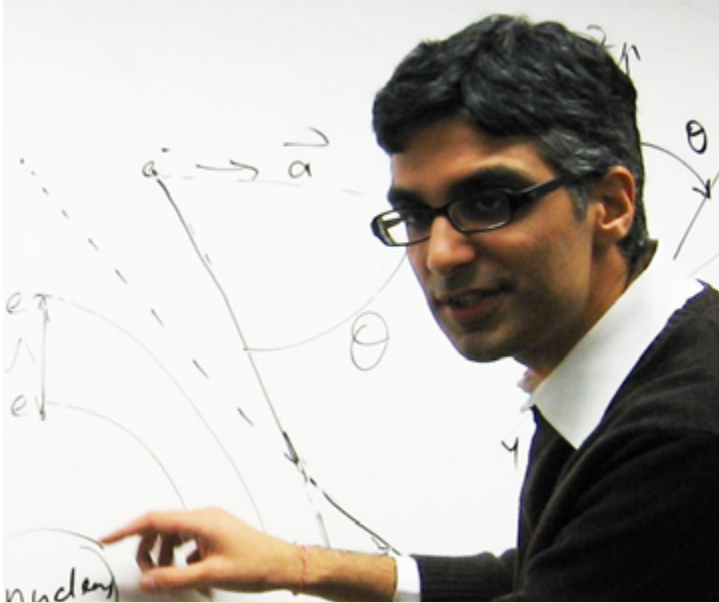
The work is the first step before the building can be transformed into modern, centrally-located shops to begin the Laboratory’s \$26 million Infrastructure Operations Inventory (IOI) plan. The IOI is funded through the Department of Energy’s Science Laboratory Infrastructure (SLI) funds.

“This is going to recover over 30,000 square feet of the basement area that would otherwise be unusable, so this gives us a huge potential capability for the future,” said Michael Viola, the construction manager for the concrete removal project.

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PPPL fusion comic

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Sajan Saini (Photo by Massimo Licata)

The illustrations are meant to provide a window into the subject that conveys the emotion behind the quest for fusion energy, rather than a literal depiction of the technology. "I'm not a very realistic painter," said Espinosa, a former art director at Warner Bros. Studio. "I'm more of an impressionist."

The comic evokes the quest to harness star power, Saini said. "The mood of the comic tries to really capture a sense of a vast cosmic scale being made palpable, being made into something that we can realize within our own hands," he said.

The project was the brainchild of Kitta MacPherson, PPPL's former director of communications, who had seen Saini and Espinosa's work in the EQuad News, a periodical published by the Princeton School of Engineering and Applied Science in the summer 2014 edition. The challenge was to make the quest accessible to a general audience, Saini said. "Frank and I wanted to explore new territory where we took the lessons of superheroes and the science fiction genres to create a feeling of awe and excitement," he said.

The two visited PPPL last winter and interviewed scientists, including PPPL Director Stewart Prager, former Deputy Director for Operations Adam Cohen, NSTX-U Program Director Masa Ono, and head of Science Education Andrew Zwicker. Saini said the conversations led him to think about the challenges of creating a plasma that is dense enough and hot enough for long enough to produce fusion energy.

"We didn't want to just make a star-struck depiction of this technology that offers promises of what would come tomorrow," Saini said. "That was part of the story, but we really wanted to spend the core of the story talking about what is happening today."

Espinosa, a professed science buff, was struck by the researchers' enthusiasm about the future of fusion energy. "I was trying to channel that energy of hope," Espinosa said. "I always try to figure out how we can get a really hopeful feeling out of this because it's a visionary thing."

Espinosa came up with sketches for the comic book early on while Saini wrote the text. They consulted with MacPherson and Zwicker on early versions of the comic book. Later on in the process, Science Editor John Greenwald helped Saini revise the text and decided some of the final details, such as the size of the comic and the paper to be used.



Frank Espinosa (Photo by Ilaria D'Uva)

Graphic designer Kyle Palmer consulted on the visuals for the comic and helped put together the pages, including the typography for the inside covers, which Greenwald wrote. Palmer said the final product is a great tool to teach a generation that grew up on comic books, as he did, about fusion energy. "It takes the impact from the text and from the visuals, which is really unique," he said.

PPPL owns the artwork in the comic book. A blown-up version of the dreamy, futuristic cover image will be featured outside the NSTX-U Control Room overlook area.

Espinosa and Saini, both of whom live in New York, have been friends since 2006 when Saini audited a class that Espinosa taught on graphic design at MIT, where Saini was a postdoctoral associate after having graduated two years earlier. The two discovered that they shared a love for comic books but didn't work together until they collaborated on the comic in the EQuad News last year.

Saini had taught physics at Queens College, CUNY, for four years, before deciding to pursue his interest in science education and writing. For the past four years he has taught in the Princeton Writing Program, where he conducts a seminar on "Superhero Trials" in which much of the reading list is comics. Saini was first introduced to PPPL while working with Zwicker on a science video program Saini co-founded called "Science Action," in which some students filmed videos about fusion energy at PPPL.

Espinosa is a graduate of the School of Visual Arts in New York. After working at Disney studios as an intern, Espinosa spent 13 years at Warner Brothers Studios, where he became the art director of character design and redesigned the complete lineup of Looney Tunes characters. He has since focused on creating comic books, including a series called "Rocketo: Journey to the Hidden Sea" for Image Comics. He has also created a biographic comic on the life of Italian shoe designer Salvatore Ferragamo.

Espinosa said he is very happy with the comic book that he and Saini have produced for PPPL. "I'm very proud of it because for us it's just the beginning of a way of communicating," he said. "I think it's really important for people to look at science as art. The two subjects can combine very beautifully." 📖

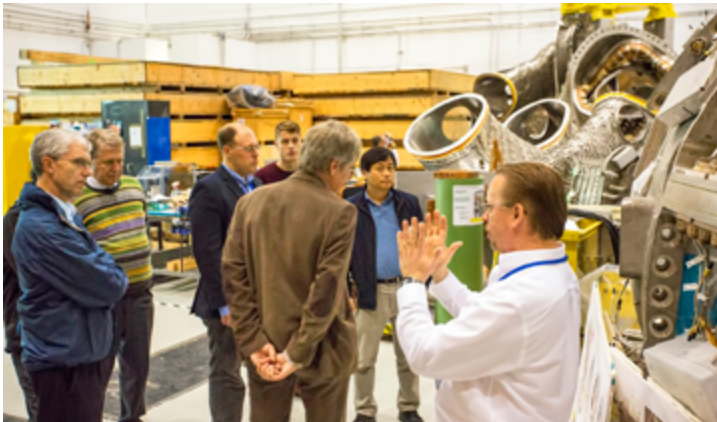
18th International Spherical Tokamak Workshop

Scientists from around the world gathered at Princeton University last week for the 18th International Spherical Tokamak Workshop and the 2015 U.S.-Japan Workshop on ST Plasmas. The sessions brought together physicists from the U.S., Asia and Europe for presentations and discussions to advance the understanding of spherical tori and compact tori configurations and enhance their potential for fusion energy applications. Jon Menard hosted the events, which were held on the main campus in McDonnell Hall.

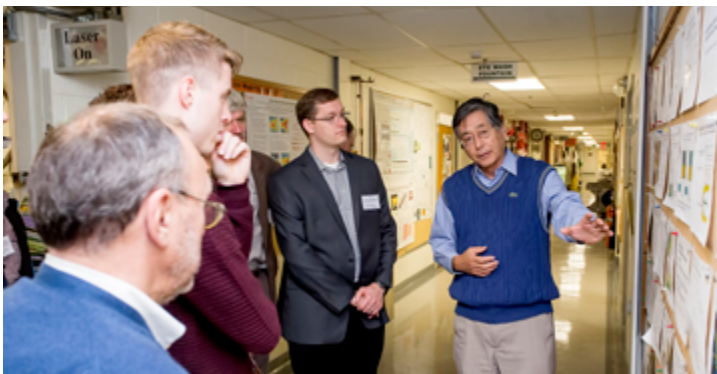
About 35 people attending the workshop toured the Laboratory on Nov. 5. The tour guides were Jon Menard, Stan Kaye, Mike Jaworski, and Bob Kaita, with Hantao Ji and Masaaki Yamada, Sam Cohen, Dick Majeski, Dave Gates, Brian Kraus, Devon Battaglia, Stefan Gerhardt, and Al von Halle serving as facility hosts. 📷



From left to right: Steve Eckstrand, program manager at the U.S. Department of Energy; James Van Dam, Director of the Office of Science Division of Research; and Mark Foster, program manager for Advanced Tokamaks. (Photo by Carol Ann Austin)



David Gates shows visitors QUASAR.



Masaaki Yamada explains the Magnetic Reconnection Experiment.



Stefan Gerhardt at NSTX-U.



Researchers attending the Spherical Tokamak Workshop and U.S.-Japan Workshop at Princeton University.

IOI project update

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The \$1.4 million contract to remove the concrete has been awarded to R. Baker and Sons, of Red Bank, New Jersey. The workers will receive safety training and will erect a large plastic enclosure called a “dust barrier” around the foundations before beginning the removal, which will conclude by April 1.

The project is being paid for by GPP funds, which are designated maintenance funds from the Department of Energy’s Office of Fusion Energy Sciences. Once the concrete is removed, the CMG building will be renovated to accommodate tech shops from RESA. Starting in July 2017, technicians would move tooling and machinery from the RESA building into the MG building and the RESA building would be converted into a long-term storage site. Storage trailers on site would then be removed or discarded in May 2018 .

At the same time, the LSB annex would also be refurbished from July 2016 to July 2017 to create new office and meeting spaces. After Mod 6 staff are moved into the newly renovated LSB annex, the Mod 6 building will be demolished. However, before construction can begin on the LSB annex all current occupants will need to be relocated to temporary offices, said John DeLooper, interim deputy director for operations. “We have people working on a plan to identify where people are going to move by the end of January,” said DeLooper. “We have options to find space around the Laboratory or we’ll have to rent trailers.”

The contractors removing concrete in the C Site MG building will use a diamond saw (a loop saw that is studded with small diamonds) and cutting blocks to cut through the concrete and cart it off on a flatbed truck, Viola said. That will mean there will be no blasting and a minimal of jackhammering. The C Site MG building will be cordoned off during the removal project and PPPL’ers should avoid the area, he said.

Plans for the IOI were presented at a director’s review of the project Oct. 19 to 20 in preparation for a Department of Energy review Dec. 15 to 16. A team of reviewers will assess the project’s scheduling, cost, technical design safety, and management for CD 2 (critical decision 2). If the DOE approves the plans, the project will move forward with final designs.

The design work is on schedule to complete all the milestones, said Ron Strykowski, the IOI project manager. Architects from the architectural firm HDR Inc., based in Lawrenceville, New Jersey, have been working on the design and project cost estimates. An independent construction firm will review the designs and prepare an independent estimate. Meanwhile, a commissioning agent will also review the designs to make sure that everything will operate according to the specifications of the project. These contractors provide “a sanity check” early in the design process, Strykowski said. He said he is confident the project is on track. “The work has begun,” he said. “We’re moving forward.”

Brunkhorst receives Innovators Award



Chris Brunkhorst

The New Jersey Inventors Hall of Fame presented PPPL engineer Chris Brunkhorst with a 2015 Innovators Award for developing a novel technique to significantly reduce Salmonella poisoning by pasteurizing eggs with radio frequency heating. The U.S. Patent and Trademark Office has patented the technique, which Brunkhorst developed with David Geveke and Andrew Bigley of the USDA Agricultural Research Service. Brunkhorst received the award during a Hall of Fame dinner on Oct. 22. (Photo courtesy of New Jersey Inventors Hall of Fame).

PPPL celebrating recycling all through November

America Recycles Day is Nov. 15 and PPPL is celebrating throughout the month of November with a colloquium on “Sustainability Economics” and numerous opportunities to recycle everything from electronics to goggles and hard hats.

The highlight of the activities will be a colloquium on Nov. 24 at 4:15 p.m. in the MBG Auditorium given by James Morris, author of “Practical Recycling Economics.” Morris, an associate vice president for Continuing Education at Rutgers University’s Division of Continuing Studies, will discuss the economics of sustainability.

Members of the Green Team will also be on the lookout to catch people “green-handed” during the week of Nov. 16. They will award prizes for people with good sustainable practices, such as recycling, using lunchboxes, or bringing their own cups.

There will also be plenty of ways for PPPL’ers to recycle, including:

- Electronics collection by Unicor, Nov. 17 from 7:30 a.m. to 10 a.m. next to the warehouse facing ESU.
- Office supply recycling by Terracycle: Bring old office supplies to the collection box in the lobby. Allowable items include tape desk organizers, card and document filers, binders, calendars, labels, staplers, hole punchers, dividers, paper cutters and correction supplies, as well as fasteners including paper clips, staples, and binder clips. Please do not discard paper, plastics or cans that could be placed in regular recycling, electronics, hazardous waste such as batteries or aerosol sprays or organic items.
- Personal protection equipment recycling by Terracycle: Bring old safety glasses and hard hats, as well as earplugs and gloves to the collection box next to the stockroom.
- Clothing drive: Help Princeton University collect clothing for the Rescue Mission of Trenton, which is trying to break the world record for clothing donations. The collection box is inside the Lower Parking Lot entrance to the LSB building. 📍

COLLOQUIUM

W7-X Status Report

Dr. Thomas Sunn Pedersen
Max Planck Institute of Plasma Physics



Thursday, Nov. 12
4 p.m., M.B.G Auditorium, Lyman Spitzer Building

Holiday Food Drive

PPPL will take part in the University’s holiday food drive from **Nov. 30 through Dec. 16**. The food will go to the Mercer Street Friends Food Bank, which has been a leader in fighting hunger in the Mercer County area, supplying food to nearly 50 pantries, shelters and soup kitchens for nearly 20 years.

Flu Vaccines Are Here!

Influenza is a contagious disease caused by a virus. It can be spread by coughing, sneezing or nasal secretions.

By getting the flu vaccine, you can protect yourself from influenza and may also avoid spreading this illness to others.

Please call the OMO at extension 3200 to make an appointment.

Thank you.

—The OMO Staff

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 November 9	Tuesday November 10	Wednesday November 11	Thursday November 12	Friday November 13
COMMAND PERFORMANCE Chef's Feature	Chicken Pecan with Apple Walnut Stuffing served with Italian Green Beans	Chicken Mushroom Stroganoff served over Fettuccine	Open-Faced Hot Roast Beef served with Baked Potato and Vegetable	Chicken Fajita served with Beans & Rice	Linguine with Red or White Clam Sauce served with Garlic Bread
Early Riser	French Toast with Cranberries & Apples	Cream Chipped Beef on Toast with 2 Eggs and Potatoes	Grilled Cheese Texas Toast with Egg, Sausage, Jalapeños & American Cheese	Sausage & Gravy over Biscuits with 2 Eggs & Potatoes	Spanish Omelet
Country Kettle	Creamy Vegetable	Italian Wedding Soup	Vegetable Barley	Baked Potato Soup	Wild Mushroom Bisque
Grille Special	Texas BBQ Beef Sloppy Joe with Southwest Slaw & Onion Rings	Pulled Pork with Broccoli Rabe and Provolone on French Bread	Bratwurst & Sauerkraut Torpedo with German Potato Salad	Fried Chicken Tenders & Waffles with Spicy Maple Syrup	Tofu Parmesan Sub
Deli Special	Loaded Baked Potato	Tossed Salad with Cowboy Beef Brisket & Ranch-Style Beans	Caesar Chicken Club Sandwich Wrap	Fried Flounder Torpedo with Lettuce, Tomato & Tartar Sauce	Tarragon Chicken Salad on Focaccia Bread
Panini	Egg Salad BLT on Toasted Sourdough Bread	Chicken Parmesan Sub	Breaded Chicken Cutlet on a Kaiser Roll with Lettuce and Tomato	Portobello Mushroom, Roasted Pepper, Spinach & Feta Cheese on Focaccia Bread	Roast Beef & Cheddar with Grilled Onions & Chipotle BBQ Sauce on Ciabatta Roll

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/>.