



**The PPPL Highlights for the week ending May 26, 2018, are as follows:**

### **NSTX-U RECOVERY AND RESEARCH (J. MENARD)**

#### *Recovery:*

PPPL staff spent this week abroad to witness the fabrication of the copper conductor to be used for the production PF1 coils.

For the inner poloidal field (PF) coils, the prototype coil at PPPL has been placed in the vacuum pressure impregnation (VPI) mold. The mold is leak-tight at room temperature and will be followed by additional checks at 60C prior to initiating the VPI process. At one vendor, the prototype coil is out of mold and electrical testing is imminent, to be followed by dimensional inspection. Two other vendors are completing winding of the fourth of four turn layers.

#### *Research:*

S. Kaye traveled to the U.K. to participate in the Culham Centre for Fusion Energy (CCFE) Program Advisory Committee Meeting on May 15-17. The review covered all aspects of CCFE fusion science and technology plans. He also remained in the U.K. to discuss collaborations, post-doc exchanges, and TRANSP implementation with the MAST-U researchers. On March 21, Kaye participated remotely in a U.K. Fusion Advisory Board meeting that was held at CCFE, and he participated remotely in the DIII-D Five-Year Plan Review on May 23-25.

On May 19, D. Mueller was awarded an honorary Doctorate of Science degree from MacMurray College that cited his concentration on the development of controlled thermonuclear fusion. Mueller made a brief comment regarding the help graduates had received from classmates, professors, and friends that made their success possible.

### **U.S. ITER FABRICATION (H. NEILSON)**

A U.S. ITER Design Readiness Review of the Low Field Side Reflectometer (LFSR) diagnostic was held the week of May 21 at the Laboratory. The purpose was to provide feedback to the LFSR design team in preparation for a Preliminary Design Review (PDR) scheduled for June 21-22. In four days of discussions and presentations, team members from General Atomics, UCLA, Palomar Scientific, and PPPL met with reviewers to explain the system design, which spans a diverse set of technologies ranging from plasma-facing components subject to intense heating from fusion neutrons to microwave electronics and transmission line components. The system will extend from microwave antennas inside the ITER vacuum vessel to signal-processing electronics in the ITER

Weekly

# HIGHLIGHTS



diagnostic building, a span of 40 meters. The review panel, chaired by PPPL's D. Loesser, included representatives from the U.S. ITER Project Office, the ITER Central Team, University of California at Davis, Massachusetts Institute of Technology, and PPPL. In its closeout briefing on May 24, the panel provided numerous suggestions that the team will use to shape its priorities for PDR preparation over the next few weeks.

## **ITER & TOKAMAKS (R. Nazikian)**

### **DIII-D (B. Grierson)**

#### *Research:*

This week, F. Poli visited DIII-D to continue collaboration with high-performance scenario analysis and predictive modeling. One group meeting reviewed progress on interpretive analysis of experiments executed in 2018 for the Joint Research Target and Milestone #3 for the PPPL/DIII-D collaboration. Poli also held meetings with B. Victor (LLNL) and K. Thome (ORAU) to continue mentorship of TRANSP users who are taking advantage of the time-dependent predictive capability for designing experiments.

#### *Operations:*

DIII-D is currently undergoing a long torus opening for an upgrade of a 210-degree neutral beam (NB210) for off-axis and toroidal steerable injection. Removal work of NB210 is well underway after two weeks of effort and is presently ahead of schedule. A. Nagy has been leading this effort. On May 23, Nagy held a successful PDR on the platforms, movable and non-movable, associated with this NB work. The movable decks are needed for maintenance on the tilted NB for source and beam access.

A new junior engineer, T. Raines, has been hired to work under Nagy. Taylor will be involved in DIII-D activities that include the co/ctr off-axis neutral beam project, TF reversing switch, helicon switches, design, and more.

### **KSTAR (S. Scott)**

An additional 15 sightlines of the MSE background polychromator have arrived at KSTAR. B. Mumgaard will travel to KSTAR on June 3-6 for completion of the re-assembly and integration into the KSTAR data system. S. Scott will travel to KSTAR June 10-18 for a scheduled in-vessel calibration.



## **ADVANCED PROJECTS (H. NEILSON)**

### **Stellarators (D. Gates):**

D. Gates visited General Atomics in La Jolla, CA from May 23rd to 25th to participate in a panel meeting for the DIII-D 5-year plan review. The DIII-D team scientific team presented the contents of their 5-year plan to a panel consisting of national and international program leaders. Highlights of the proposal include new current drive actuators and plans for core-edge integration. The purpose of the meeting was to help the panel members understand the research priorities for the proposal that the team recently submitted to FES. Final reviews will be submitted by panel members directly to FES.

### **THEORY (A. BHATTACHARJEE):**

A figure from the paper, "Electron Physics in 3D Two-Fluid Ten-Moment Modeling of Ganymede's Magnetosphere," by L. Wang, A. Hakim, C. Dong and A. Bhattacharjee was selected by J. Geophys. Res. Space Phys. to appear on the cover:

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/jgra.53788>

E. Hirvijoki received a Research Fellow five-year grant from the Academy of Finland.

## **SITE PROTECTION (F. WHITE)**

This week was the 44<sup>th</sup> Annual EMS week. The Site Protection Division thanks and honors our Emergency Services Unit medical personnel for their dedication in providing day-to-day lifesaving services on the front line. Your continued commitment to service to the Laboratory and surrounding communities is greatly appreciated.

Ambulance 166 responded to two mutual aid assignments in Plainsboro Township. Engine 66 responded to a mutual aid assignment in Princeton Township.

## **SCIENCE EDUCATION (A. ZWICKER)**

On May 21, approximately 700 girls from about 65 schools attended the 18th Annual PPPL's Young Women's Conference in STEM. With all attendees, chaperones, exhibitors, speakers and about 75 volunteers, almost 1,000 people were at the 2018 YWC - the biggest YWC to date. Tammy Murphy, First Lady of New Jersey, made an appearance, and stopped by all of the exhibits. She was very impressed by the event and how wonderfully it all flowed.



## **COMMUNICATIONS (L. BERNARD)**

The Office of Communications posted a press release to the PPPL website about N.J. First Lady T. Murphy attending this year's Young Women's Conference in Science, Technology, Engineering, and Math. PPPL has organized the Young Women's Conference for 18 years with the aim of changing statistics showing that a comparatively small percentage of women are entering STEM fields, particularly in engineering and physics. J.J. DeVoe distributed press releases for the Young Women's Conference, which was covered by reporters from NJTV, ABC News 6 Philadelphia, and Chasing News, with a short segment appearing on Chasing News and a longer segment, with interviews of First Lady T. Murphy, and PPPL's D. Ortiz and N. Allen, appearing on NJ TV News on May 21 that can be viewed here: <https://www.njtvonline.org/news/video/new-jerseys-first-lady-encourages-girls-to-pursue-stem-careers/>.

## **DIRECTOR'S OFFICE (R. HAWRYLUK)**

On May 23, R. Hawryluk presented a colloquium entitled, "What Will We Learn From ITER?"

PPPL hosted two officials from the U.S. Department of Energy (DOE) and the federal Office of Management and Budget (OMB) on May 23. K. Klausing, director of the DOE Office of Science Budget Office, and T. Bar-Shalom, a program examiner from the OMB, met with P. Johnson, the Princeton Site Office Manager, and S. Rogan, deputy PSO manager. R. Hawryluk, interim director, M. Zarnstorff, deputy director for research, D. Carle, head of Facilities and Site Services, S. Weidner, the Princeton University assistant vice president for research, and C. Reno, the Princeton University assistant vice president for operations, also participated. S. Gerhardt, deputy director of the National Spherical Torus Experiment-Upgrade (NSTX-U) Recovery Project, led a tour of NSTX-U, and the Lithium Tokamak Experiment- $\beta$ , led by D. Majeski. D. Carle, head of Facilities, and L. Hill, head of Project Management, led a tour of facilities, including the C Site-MG Building, Theory Wing, the RF Building, and other sites.

**This report is also available on the following web site:**  
<http://www.pppl.gov/publication-type/weekly-highlights>