

## **NSTX-U Weekly Report (June 22, 2012)**

### **NSTX-U is in the Upgrade Project outage in FY 2012**

Four NSTX researchers were honored for their efforts on Snowflake Power Divertor developed which received the 2012 R&D 100 Award for their innovative divertor research. The R&D 100 Awards (<http://www.rdmag.com/>), widely recognized as the "Oscars of Innovation", identify and celebrate the top high technology products of the year. The Award honored the "snowflake power divertor", a novel plasma-material interface concept with a highly promising potential for divertor heat and particle load mitigation in the tokamak. Vlad Soukhanovskii (LLNL), who designed and led the experiments, Jon Menard (PPPL), the NSTX program director, Egemen Kolemen (PPPL), and Joon-Wook Ahn (ORNL) are among the twelve physicists recognized in the award. Dmitri Ryutov, a LLNL theorist, proposed the snowflake divertor idea and led the theoretical effort. Experiments on NSTX and on the Swiss tokamak TCV in Lausanne confirmed theoretically predicted properties of the snowflake divertor. Based on successful NSTX experiments, the snowflake divertor is promised to be a leading heat flux handling strategy on NSTX-Upgrade. (V. Soukhanovskii)

Lane Roquemore (PPPL) recently returned from RFX in Padua, Italy where he worked on a new Li granular injector. This injector is made up of a Li dropper and high-speed rotating impeller made at PPPL and a vacuum chamber and internal telescoping flight tube both made at RFX. The components were assembled and evacuated and all control systems were successfully tested. Approximately 8 grams of 0.7 mm diameter Li granules were loaded into the dropper and high-speed particles were successfully directed into a target 75 cm from the impeller. The injector system was then vented with argon and mounted onto RFX behind a gate valve. The system will be pumped for several days while the installation of field cabling and controls are completed. Injection will commence into RFX the last week of June and continue through mid-July. Dennis Mansfield will arrive on July 1<sup>st</sup> to participate in the experiments and reload the dropper with 1 mm pellets that are expected to have better penetration into the RFX plasma. (L. Roquemore)

### **Engineering Operations (A. von Halle, C. Neumeyer)**

NSTX Upgrade construction activities continued this week with the successful installation of the first of the new TF clevis pads. Spatial/distortion measurements of that installed clevis pad were successfully completed, and final machining of the remaining clevis pad parts will now be completed and scheduled for installation. The last of the old TF clevis blocks has been removed from the vessel. The cutting/removal of the Bay J-K nozzles started this week, and will be followed by the installation of in-vessel stiffeners before the cutting of the vacuum vessel to install the Bay J-K cap and 2nd neutral beam port. The TF inner conductor soldering procedure has been streamlined to provide the optimal balance of temperature and cooling conductor support, and the inner conductors that have had the cooling tubes soldered in place are being sandblasted, cleaned and prepared for insulation wrap. On neutral beams, refurbishment and fabrication of parts for the second beam-line continued, as well as the vacuum leak checking of the new rectangular bellows and the two new 1 meter VAT valves for the beam to torus transition ducts.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center.