Nuclear Science Division Newsletter

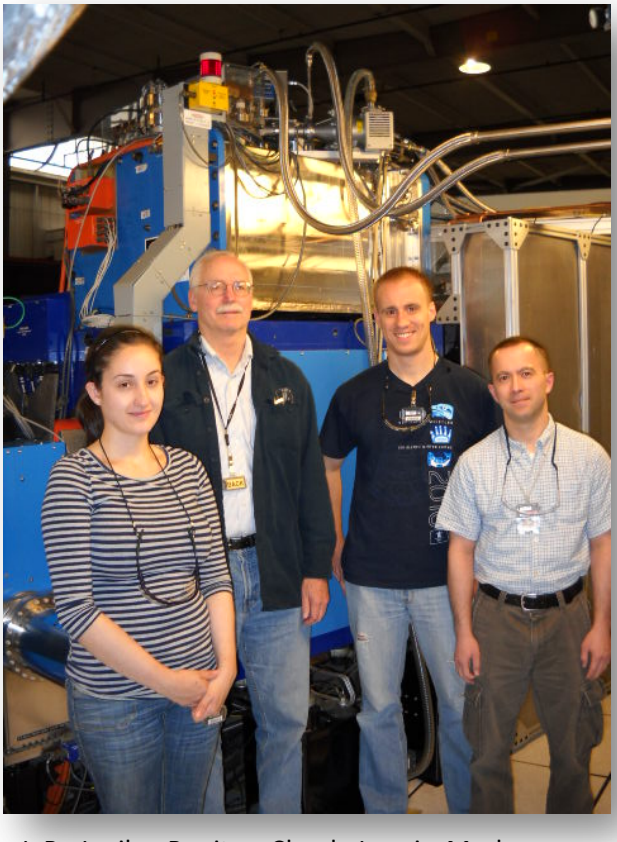
In this issue: **May, 2011**

With VENUS ascendant, 88-Inch reaches record intensity

Recent improvements of the 88-Inch cyclotron ion sources and injection lines have resulted in an increase in maximum beam intensity of 200 MeV $^{40}Ar^{9+}$ ions. Injecting with the VENUS ion source, we accelerated 24 µA of beam which broke the long-standing record of 18 µA from 1999 with the AECR. This result shows that it is possible at LBNL to produce a 2.7 pµA 200 MeV beam of ions with the same mass-over-charge ratio as $^{48}Ca^{11+}$. This increased beam intensity will be beneficial for the super-heavy element research program.

The next goal is now to proceed with installation of a newly designed cyclotron center region which includes a spiral inflector. This component should allow for even greater beam intensities through the cyclotron. It will also reduce down time compared to the present grid-based system which often needs to be replaced during high-intensity operation. In parallel the ion sources are being upgraded to deliver higher intensities of $^{48}Ca^{11+}$. Further planned improvements are upgrades of the bunching system and cyclotron exit deflector.

This work is part of the High-Voltage injection upgrade project which is sponsored by the American Recovery and Reinvestment Act.



L-R Janilee Benitez, Claude Lyneis, Markus Strohmeier, Ken Yoshiki Franzen in front of the Venus Ion Source.

Happy Birthday to JET Collaboration

May 1st this year marked the first birthday for the JET Collaboration, one of three topic collaborations approved by DOE at the end of 2009. The JET Collaboration was formed to address the outstanding challenges in the study of hard probes in high-energy heavy-ion collisions that have become an essential part of US and worldwide effort to investigate the properties of strongly coupled quark-gluon plasma at high temperature. Within the framework of the JET Collaboration, theorists from LBNL and 8 other institutions have carried out a series of collaborative research activities during the first year of operation: they completed a comparative study of modified fragmentation functions from different approaches to parton energy loss and identified the area for improvement; a (3+1)-dimensional viscous hydrodynamic code was developed to provide space-time evolution of the bulk matter for the study of jet propagation inside the dynamic medium; an effort to develop Monte Carlo simulations of parton energy loss in medium with different approaches was started. All of these collaborative activities were completed under four working groups and were facilitated by weekly EVO conferences and collaboration meetings. The first JET Summer School was also held at LBNL during the summer of 2010 which was followed by an inaugural JET Symposium. As the host institution of the JET Collaboration, LBNL provided the infrastructure support and contributed to the research activities, in particular in the investigation of a complete NLO calculation of parton energy loss. With the new exciting new results from LHC, the JET Collaboration is posed to have another productive year. Results and publications of JET Collaboration can be found at http://jet.lbl.gov.

NSD Fragments…

Darleane Hoffman of the Nuclear Science Division has added the 2011 Glenn T. Seaborg Actinide Separations Award to her long list of honors in nuclear chemistry. Actinides, the 15 chemical elements between actinium and lawrencium, most famously include uranium and plutonium. Established in 1984 by the annual Actinide Separations Conference, principal gathering of the nation's actinide chemists and engineers, the first Seaborg Award was presented to plutonium discoverer Seaborg himself. Hoffman is the second Berkeley Lab winner since Seaborg and the first woman in the award's history. She will receive the award, consisting of a plaque and honorarium, May 26 at the 35th Annual Actinide Separations Conference in Charlotte, North Carolina.

Paolo Ferracin, from LBNLs Accelerator & Fusion Research Division has received a 5-year DOE Early Career Research Program grant, to work on a 56 GHz ECR Ion Source, for use in FRIB and other applications. His proposal was entitled, "Development of Nb3Sn Superconducting Magnets for Fourth Generation ECR Ion Sources.

NSD welcome two new postdocs to the division in April: Mauro Cosentino joined the relativistic nuclear collisions group, where he will work on ALICE. Leonard Eun has also joined the RNC group; he will work on spin physics.