

## **Sixth Summer School on Exotic Beam Physics**

**August 6-11, 2007**

The Sixth Summer School on Exotic Beam Physics was held August 6-11, 2007 and is a series of summer programs aimed at educating young researchers about the challenges of radioactive ion beam physics. Through these schools the research community will be able to exploit fully the opportunities created by the next generation exotic beam facilities. The schools are jointly organized by the 88-Inch Cyclotron (A. Macchiavelli), ATLAS (K. Lister), HRIBF (J. Beene), MSU/NSCL (M. Thoennessen) facilities and N-Division of LLNL (L. Ahle) and is an annual event, with the organization rotating among these laboratories. This school was organized by Raman Anantaraman and Michael Thoennessen.

Those interested in participating in the summer school were applying electronically by sending the following information: Name, Year of study, Institution, Research interests, Willingness to give a short presentation on his/her research, Contact information (postal address, e-mail address, phone number, fax number), and Supervisor (Professor): name and contact information. The applications were followed by a recommendation letter from a supervisor. The School received 79 applications. The participants were selected by the School Directors.

The school had four main components:

The mornings were devoted to lectures on the science which can be addressed by exotic beam facilities. The lectures covered broad topics in both the experimental and theoretical physics of nuclei far from stability as well as radioactive ion beam production:

- The Context of the School, Robert Janssens (ANL)
- Nuclear Theory, Alex Brown (MSU)
- Nuclear Structure, Rod Clark (LBNL)
- Nuclear Astrophysics, Ani Aprahamian (Notre Dame)
- Nuclear Reactions, Alan Wuosmaa (Western Michigan)
- Direct Reactions with Rare Isotopes, Kate Jones (Tennessee)
- Low Energy Precision Measurements with Rare Isotopes, Georg Bollen (MSU)
- Gamma-Ray Tracking Techniques, I-Yang Lee (LBNL)
- Role of Nuclear Science in Homeland Security, Dan Blumenthal (Dept. of Homeland Security)

The afternoons provided opportunities for 'hands-on' demonstrations of experimental equipment and techniques useful in rare isotope research. The hands-on part of the program was held at the Couple Cyclotron Facility (CCF) and was organized by the NSCL staff. The hands-on program covered:

- Planning for a Standard A1900 Experiment (Morrissey)
- Beam Optics (Baumann)
- LISE Use (Bazin)
- Data Acquisition & Analysis (Fox)
- Control System (Ginter)

Electronics (Weisshaar)  
Particle Identification (Stolz)

During the last day of the school the students formed six groups that were given the task to produce and identify an exotic beam using four hours beamtime at the CCF/A1900.

In the evenings students were given the opportunity to present their work. Twenty-six students gave short presentations over three days.

In addition, a welcome reception at the NSCL Atrium, dinner at a local restaurant and a dinner cruise on the Grand River provided opportunities for the participants to interact with the lecturers.

The school was very successful. Exit interviews with the students indicated that they were all satisfied with the school and would recommend it to other students. They were particularly enthusiastic about the hands-on activities. The average rating for the lectures was 3.39 and for the hand-on activities 3.48 (out of 4.0)