

## NSCL User Workshop 2008

NSCL's annual user workshop, held June 2, 2008, was attended by over 120 users. Discussion centered on new experiments to be made possible with new instrumentation at the laboratory, including capability for stopped and reaccelerated beams (commissioning expected in 2010) and the new national gamma detector array GREYINA (expected to be moved from LBNL to NSCL for a first round of experiments in 2011).

A recommendation from the 2007 User Workshop played a major part in MSU's decision to fund not only the stopped and accelerated beam capability, but also the new 10,000-square-foot experimental area, expected to be completed during summer of 2009. The new area will allow users to design and build cutting edge instrumentation, including a laser spectroscopy system, a time projection chamber, an array for nuclear astrophysics studies with exotic nuclei (ANASEN), and a precision recoil separator.

More information on the user workshop, including PDFs of many of the presentations, is available at: [meetings.nscl.msu.edu/userworkshop2008/](http://meetings.nscl.msu.edu/userworkshop2008/).

## Upcoming reaccelerated beam workshop

A workshop on reaccelerated beams at NSCL will be held August 2 as an addendum to the July 27 – August 1 Symposium on Nuclei in the Cosmos. More information on the meeting is available at:

[meetings.nscl.msu.edu/ReacceleratorExperiments/](http://meetings.nscl.msu.edu/ReacceleratorExperiments/).

## Nuclear Structure 2008 (NS2008)

The Nuclear Structure 2008 (NS2008) conference was hosted by NSCL and held in the adjacent Biomedical and Physical Sciences Building June 3–6, 2008. NS2008 marked the 12th meeting in this series devoted to recent experimental and theoretical developments in the research on nuclei near the limits of isospin, spin and excitation energy. Meetings in this series have previously been held at ORNL, LBNL, ANL, and Chalk River.

The conference program consisted of 66 oral presentations and more than 80 poster presentations. The program also included a welcome reception in the MSU Demonstration Gardens, a tour and reception at NSCL, and a banquet held at the MSU Kellogg Hotel & Conference Center. More than 220 scientists attended NS2008, and their active participation, along with the outstanding level of the presentations, led to a very successful conference.

## From the *CERN Courier*: The stop-start approach to rare isotope beams

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"The obvious way to create low-energy beams is to slow down high-energy ones, but this severely degrades their quality," writes science journalist Don Monroe in the July/August *CERN Courier*. "A better technical approach is to stop the beams, extract them and then reaccelerate them or use them at low energies. This is the path that MSU has opted for in upgrading its NSCL facility."

The complete article is available at: [cerncourier.com/cws/article/cern/34931](http://cerncourier.com/cws/article/cern/34931).

## Operations update

NSCL's summer shutdown will end a month early, the result of partially restored NSF funding for FY08. Coupled Cyclotron Facility operations will commence September 2 with PAC-approved experiments beginning September 15. Contact Raman Anataraman ([raman@nscl.msu.edu](mailto:raman@nscl.msu.edu)) with questions.



Finished niobium and titanium components for assembly into superconducting cavities for the NSCL reaccelerator; NSCL engineer Patrick Glennon is pictured in the background.

## PAC 32 Results

The 32<sup>nd</sup> meeting of the NSCL Program Advisory Committee (PAC 32), held March 28-29, considered 31 proposals for 4,624 hours of beam time. The committee recommended allocation of 2,070 hours for 16 experiments broken down as follows:

- 113 experimenters from 26 institutions in five countries in the approved proposals, including 26 graduate students (20 from NSCL) and six undergraduates (two from NSCL)
- more than 70 percent of the total allocation (1,499 hours) for external-internal collaborations
- 933 hours for experiments led by external spokespersons
- 1,137 hours for experiments led by internal spokespersons

The list of approved experiments has been posted at: [www.nscl.msu.edu/exp/approvedexp/32](http://www.nscl.msu.edu/exp/approvedexp/32).

## A User's Perspective

Alfred Dewald, University of Cologne, Germany

With pleasure I accepted the invitation from NSCL assistant professor Kris Starosta in 2004 to collaborate on a project aiming to use the recoil Doppler shift technique for the measurement of lifetimes of nuclear states populated in reactions with intermediate energy beams.

I was very impressed reading through the comments by the NSCL PAC on the proposal put in by Kris. The proposal was neither accepted nor rejected but instead, the achievements of several milestones were demanded in a step-by-step approach. This is the right way to develop a new experimental technique, a process in which final success cannot be guaranteed. At most comparable facilities it would be difficult to pursue step-by-step development, largely because beam time is considered to be too precious for test runs. The reality is that often accepted production runs may end up as bad test runs.

We were happy to be allowed to perform our first test run at NSCL with a stable  $^{124}\text{Xe}$  beam. This was successful and showed that rates, detector resolution and background control were sufficiently good to observe well developed Doppler shift components in the measured spectra (ref.1)

As a next step, we designed and built a dedicated plunger device in Cologne (ref. 2), which was added to the local equipment such as SeGA and the S800 spectrometer required for the planned recoil distance run. During the experiment, I appreciated very much the high competence of the experts operating the cyclotrons, A1900 fragment separator, the S800 spectrograph and the SeGA spectrom-

ter. Thanks to their joint effort, we could finally perform the first plunger experiment at intermediate beam energies using Coulomb reaction, aiming for  $^{114}\text{Pd}$  as well as a knockout reaction aiming for the investigation of  $^{64}\text{Ge}$ . Whereas the first was an accepted proposal, the latter was a short test run given as discretionary beam time.

The  $^{64}\text{Ge}$  run was analyzed first and the results were published in a 2007 *Physical Review Letters* article (ref.3). It turned out that worries about the issue of unobserved level feeding, which can obscure the determined lifetime values, was not a big problem. The Coulomb excitation data showed some unexpected inconsistencies. Meanwhile, we know the reasons for these inconsistencies and are working to finalize the analysis.

My conclusion is that a step-by-step approach towards a new technique is not necessarily a waste of precious beam time, but in fact may help to save it in the end. I am convinced that less gambling and more systematic development work is the more scientific approach to solve problems.

- [1] A. Chester et al., Nucl. Instr. Meth. A562, 230 (2006)
- [2] A. Dewald et al. in GSI Scientific Report 2005, 38 (2006)
- [3] K. Starosta et al., Phys. Rev. Lett., 99, 042503 (2007)

## NSCL Users in the News

Among the NSCL user research receiving media attention in recent months was a 2007 *Physical Review Letters* paper by University of Warsaw physicist Marek Pfützner (see "New experiments view details of nuclear two-proton emission" in the January 2008 *Physics Today*, reported by Steven Blau, and "Camera captures image of two-proton decay" in the January/February *CERN Courier*, reported by NSCL science writer Geoff Koch). To read Pfützner's paper, see PRL **99**, 192501.

The MoNA collaboration generated news in the first half of 2008, as well. An NSCL-produced video update from the collaboration will air on the Research Channel, arranged by the National Science Foundation. (The video is also available on NSCL's YouTube channel: see [www.youtube.com/nsclmedia](http://www.youtube.com/nsclmedia).) Also, an April 2008 *Physical Review Letters* paper by Florida State University graduate student Caleb Hoffman and a host of MoNA collaborators (see PRL **100**, 152502) will be featured in the September 2008 *CERN Courier*, written by NSCL's summer science writing intern, Rachel Carr.

If you are interested in publicity for your research conducted at NSCL, please send news of any accepted papers in refereed journals to Koch at [koch@nscl.msu.edu](mailto:koch@nscl.msu.edu). He will be happy to discuss options for disseminating the information, including by working with your home institution news office.