ATR
National Scientific User Facility

The Energy of Collaboration

December 2011 Bimonthly Report

Accomplishments and Look Ahead

November 2011

- Exhibited at ANS Winter Meeting – ANS Nuclear Technology Expo – Oct. 30-Nov. 1
- Todd Allen presented on materials for nuclear energy systems at the American Vacuum Society Annual Meeting in Nashville, TN Nov. 1
- Todd Allen visited University of Cincinnati on Nov. 3
- Frances Marshall presented at Virginia Commonwealth University on Nov. 7
- Todd Allen visited the University of Missouri Science & Technology on Nov. 28
- Sebastien Teysseyre attended the Alloy 690/52/152 Primary Water Stress Corrosion Cracking Research Collaboration Meeting on Nov. 29 -Dec. 2 in Tampa, FL

December 2011

- FSRT Call Closes Dec. 16
- Jeff Benson attended the 4th Annual International Symposium on Material Test Reactors in Oarai, Japan Dec. 5-9

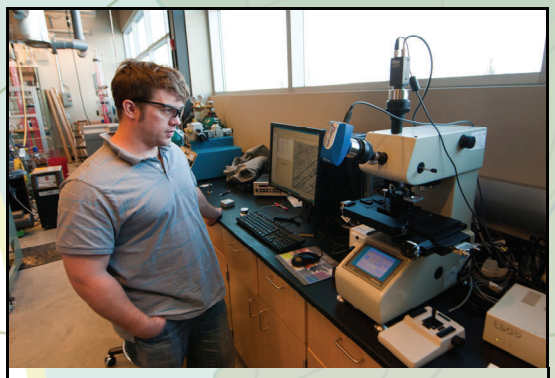
January 2011

- ATR NSUF Call for Proposals Closes Jan. 11
- Host Jacob Eapen from NCSU as a colloquium speaker
- Todd Allen will visit the University of Manchester/UK National Nuclear Laboratory Staff

Noteworthy News

UCSB Student Researcher Shares User Facility Experience Insights

Beginning in July 2011, Tim Milot, a University of California, Santa Barbara (UCSB) graduate student researcher, traded in the temperate Santa Barbara climate to come to INL to work on the ATR NSUF project titled, “Characterization of Advanced Structural Alloys for Radiation Service.” The project aims to create a library of irradiated materials, including low-run pressed alloys and pressure vessel steels for researchers who want to study the effects of irradiation. Milot came to INL to perform post-irradiation examination (PIE) on irradiated steels from this library. He will use the data he collects during his time at INL as the basis for his Master’s thesis on the effects of irradiation on steels.



Tim Milot performs micro-hardness analysis in the CAES MaCS lab.

“INL has great PIE capabilities and the ATR NSUF allows UCSB to gain access to this PIE equipment and expertise,” remarked Milot. “INL facilities can handle much hotter irradiated steels than those at UCSB and INL has a focused ion beam (FIB) to create smaller samples that can be analyzed here and at offsite facilities.”

Besides performing PIE, Milot also designed a shear punch to create small disc specimens. There is an existing shear punch in the Microscopy and Characterization Suite (MaCS) in the Center for Advanced Energy Studies (CAES) building in Idaho Falls,” said Milot, “but we needed another punch to use at the Fuels and Applied Science Building (FASB) at the INL desert site. INL PI Bulent Sencer provided the sheer punch fixture and equipment and I started with the same design as the existing punch in MaCS. Then I modified it to make a second punch. We now have one punch

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that can create 1mm discs (the punch that existed prior to Milot's visit) plus the new punch that can create 3mm disks."

Tim Milot sets up the MaCS shear punch he used as a prototype for the punch he designed for an ATR NSUF project.

While there were some obstacles along the way, Milot says he has enjoyed his experience working with the ATR NSUF. "The ATR NSUF has a lot to offer researchers and students," said Milot. "There are a good deal of resources spanning the MaCS laboratory in CAES and the INL desert site facilities," he explained. "I had access to researchers with immense experience in PIE, modern, automated hardness testing equipment, and great support from ATR NSUF Chief Scientist Jim Cole and project manager Collin Knight."

Milot was also very pleased with the technical support he received on using the equipment from those who know the ins and outs of handling irradiated material in experiments. "Brandon Miller at the Electron Microscopy Laboratory (EML) taught me handling practices for radiological samples and Brandon went out of his way to help me with my research," he said.

Milot will spend the holiday season with family Moscow, Idaho, but plans to return to INL in January or February for a short trip to finish his research. He will be back in courses at UCSB for spring semester and will work on his thesis. "I am grateful I've had the opportunity to work with researchers at INL who have such broad backgrounds and that I was able to access the PIE equipment I used in my ATR NSUF research," he commented. After graduation, he plans to return to consulting work on structural analysis and design for the nuclear, petrochemical, and solar power industries.

ATR NSUF PI honored with award from US Secretary of Energy Steven Chu

Dr. Joy Rempe receives an award from Energy Secretary Steven Chu.

ATR NSUF principal investigator Dr. Joy Rempe was one of six Idaho National Laboratory employees recognized for their technical assistance to US DOE and Japanese governments on how to respond after the earthquake and subsequent tsunami damaged the Fukushima Daiichi nuclear power plant. Secretary Chu honored the employees in a ceremony held October 27th in Washington DC. During the ceremony, employees received a commemorative statue, a plaque, and lapel pin and had the chance to meet Secretary Chu and Undersecretary for Nuclear Security Tom d'Agostino. Congratulations Dr. Rempe!

Read the entire news release at https://inlportal.inl.gov/portal/server.pt?open=514&objID=1555&mode=2&featurestory=DA_584385.

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ATR NSUF & NEUP Develop Joint Solicitation to Streamline Project Proposal Process

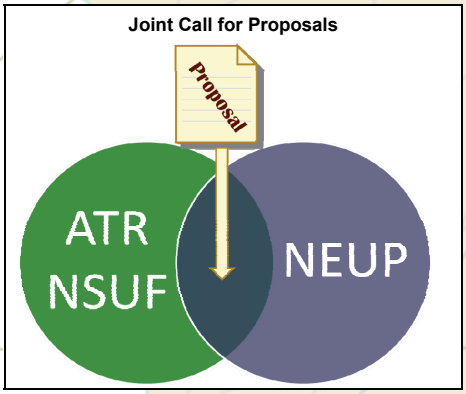
The NEUP online proposal submission form now includes a checkbox to select for use of ATR NSUF capabilities.

In response to requests from our user community, the Advanced Test Reactor National Scientific User Facility (ATR NSUF) fiscal year 2012 fall call for proposals due date was changed to accommodate a joint solicitation process with Nuclear Energy University Programs (NEUP). The U.S. Department of Energy Office of Nuclear Energy (DOE-NE) funds university-led research and development projects through NEUP. Additionally, DOE-NE offers cost-free access to university researchers through the ATR NSUF. By aligning the two calls for proposals, researchers can submit a single proposal for NEUP grant money and ATR NSUF capabilities, thus providing a "one-stop-proposal-shop" for researchers who require grant money to perform their ATR NSUF research.

Starting in FY 2012 proposals submitted through this joint solicitation (offered once each year) are reviewed and ranked by both organizations. As funding permits, proposals scored the highest by both ATR NSUF and NEUP will be awarded a NEUP research contract and access to needed ATR NSUF capabilities. While not appropriate for all projects, this joint solicitation option is ideal for mature projects that require immediate access to ATR NSUF facilities.

If time is still needed to prepare a project before it is ready to utilize ATR NSUF facilities/capabilities, researchers should forgo the joint solicitation and instead submit a NEUP proposal now and an ATR NSUF proposal when technically supportable.

Aligning these two programs greatly benefits the university research community. Dr. G. Robert Odette, PI for two ATR NSUF University of California Santa Barbara experiments, thinks aligning the call for proposals is a logical and necessary step. "It makes a lot of sense to have a coordinated proposal process," he said, "because it ensures a project can transition smoothly through all stages - from sample and capsule preparation, to irradiation, to post-irradiation examination (PIE)." This is important because it is the PIE measurements that are analyzed and published to add to the state of knowledge in the field of nuclear energy. Dr. Odette commented that prior to the alignment researchers had to secure funding for the pre- and post- irradiation stages separately. He used a cooking analogy to explain the difficulties this creates. "If a researcher can only secure funding for the irradiations, but not for PIE, it is like a chef buying the food and cooking a great dinner for the whole community that no one gets to eat," remarked Dr. Odette. An NSUF/NEUP joint call ensures that the critical research results are available to all.



Dr. Michel Barsoum, Professor of Materials Science and Engineering at Drexel University, agrees the alignment can benefit ATR NSUF projects such as his research project on new materials that can resist the extreme environments of the next generation nuclear power plants. "ATR NSUF pro-

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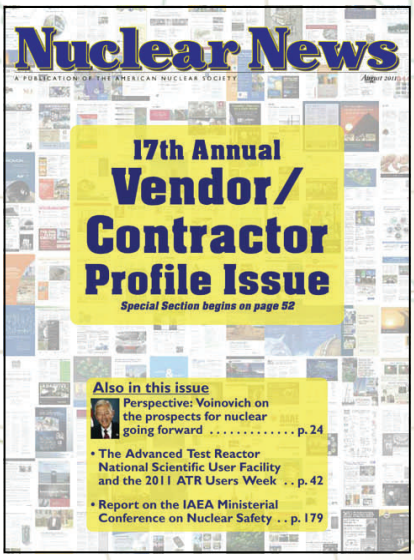
vides some limited funds for students but the timeline is restricted to three years. Unfortunately our irradiation experiment will just be coming out of the reactor in three years. That leaves the universities without student funding for the analysis, which can take several years in and of itself," comments Dr. Barsoum. "Also having NEUP funding helps us to maintain a level of continuity for students who can work on other tasks in the interim between the start of irradiation and post-irradiation examination. This helps ensure they have a meaningful experience and are able to complete their degree programs on time."

The NEUP pre-proposal process was completed on October 27th and requests for full proposals are underway. The closing date for the fall 2012 ATR NSUF call for proposals is January 11, 2012. This call is for researchers who do not require NEUP grant monies to support their research. To participate in the ATR NSUF call, please visit https://secure.inl.gov/atrproposal/Common/UserHome.aspx.

In FY 2013, there will again be two NSUF solicitations - an aligned NEUP call and a stand-alone call.

For more information about the new aligned call, visit www.neup.gov. In the online proposal submission form, the NEUP site will ask the submitter to check a box indicating if their research project requires use of ATR NSUF facilities. When the box is checked, the proposal will be ranked by both organizations and does not need to be re-submitted to the ATR NSUF website.

NSUF Featured in Nuclear News Magazine



ATR NSUF was featured in two articles in the August 2011 issue of *Nuclear News* magazine. The first article, submitted by ATR NSUF staff, gives an overview of the User Facility including how to gain access to the ATR NSUF, available capabilities, and partner facilities. The article includes an in-depth look at the unique features of the Advanced Test Reactor along with INL post-irradiation examination capabilities. It completes with a discussion of partner facility capabilities, including other reactors, PIE capabilities, proposal opportunities, the education program, media library, and program accomplishments.

The second article in the magazine was written by Jeff Terry, Chair of the ATR NSUF User Organization Executive Committee, in consultation with members of the Executive Committee. This article covers the 2011 ATR NSUF Users Week, including a summary of sessions, courses, and highlights of ATR NSUF research experiments that have already yielded promising results. If you are a member of ANS, you can read the articles in the *Nuclear News*, Volume 54, Number 9 issue by clicking on the following link: http://epubs.ans.org/?p=nn:54.

See pages 42-48 for the article on ATR NSUF entitled, "The Advanced Test Reactor National Scientific User Facility" and pages 50-51 for the article on the ATR NSUF annual users week titled, "2011 Advanced Test Reactor Users Week—Meeting the needs of the nuclear community."