



June/July 2012 Bimonthly Report

Accomplishments and Look Ahead

June 2012

- ATR NSUF announced awards from FY2011 fall solicitation.
- ATR NSUF 2011 Annual Report is now available electronically. Visit <http://atrsuf.inl.gov> and click on the "Media" link.
- Combined MeV Summer School/ATR NSUF Users Week began at ORNL on June 11 and continued through June 22 at INL.
- Todd Allen (with co-authors) selected as the recipient of the 2010 Special Achievement Award by the ANS Materials Science & Technology Division for pioneering efforts in the creation of Nuclear Fuels & Structural Materials for Next Generation Nuclear Reactors (NFSM) technical topical mtg.
- NSUF selected the Best Student Material Science Presentation award winners at the Nuclear Fuels & Structural Materials meeting at the summer ANS meeting in Chicago.
- NSUF and NEUP held a joint workshop at the summer ANS Meeting.

July 2012

- NSUF sponsored a booth at the International BWR and PWR Materials Reliability Conference in Maryland.
- Todd Allen gave an overview presentation at the International Conference on Nuclear Engineering (ICONE) in Anaheim.
- NSUF hosted graduate students Elliott Fray from MIT and Nathan Bailey from UC-Berkeley as winners of the Best Student Presentation Awards at the Student ANS Conference and the NFSM Topical Meeting. Both presented at a lab-wide colloquium and toured INL on July 25.

Noteworthy News

ATR NSUF User Organization Announces New Executive Committee Members

The ATR NSUF User Organization elected two new board members at their June 21st meeting during the 2012 Users Week event. Join us in welcoming Dr. Jim Tulenko of the University of Florida as a general board member and Peter Wells of the University of California, Santa Barbara as the student member on the Committee.

Jim is a Professor Emeritus in the Nuclear Engineering program in the Material Science and Engineering Department and the Director of the Laboratory for Development of Advanced Nuclear Fuels and Materials at the University of Florida. He is a past president of ANS and spent 23 years in the nuclear industry prior to working in academia.

Peter is a second year doctoral student at the University of California, Santa Barbara in the Materials Science department. His graduate research is focused on life extension of fission reactors, specifically on reactor pressure vessel steel embrittlement.

The Committee would like to thank outgoing board members Dr. Sean McDeavitt (general member) and Dr. Peng Xu (student member) for their service on the executive committee over the past year.

The board was created in early 2011 to provide a formal and clear channel for the exchange of information, advice and best practices between the principal investigators who perform experiments and ATR NSUF management. They also serve as an advocacy group for the experimental activities at the user facility and provide a communication channel for ATR NSUF researchers. Follow the group on Twitter at <http://twitter.com/#!/ATRNSUOchair> to keep up-to-date on member activities.

ATR NSUF Awards Five New Projects

ATR NSUF awarded three new experiments (one irradiation and two PIE-only) from the 14 proposals submitted during the fall fiscal year 2012 (FY-12) call for proposals.

Two of the projects from the fall call were awarded solely through the ATR NSUF process, but the third project was jointly awarded by the ATR NSUF and Nuclear Energy University Programs (NEUP).

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New Projects Cont.

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- The Pennsylvania State University project, led by Dr. Bernhard Tittmann, will use the research reactor at the Massachusetts Institute of Technology to study transducers that can take in-pile ultrasonic measurements of nuclear fuels and materials. Examination and analysis of the irradiated materials will take place at INL's Materials & Fuels Complex.
- The University of Illinois project, led by Dr. Jim Stubbins, will evaluate the tensile performance of irradiated iron-chromium alloys. The work will be performed by the Materials Research Collaborative Access Team (MRCAT) at Argonne National Laboratory's Advanced Photon Source, working with user facility partners from the Illinois Institute of Technology.
- The University of Michigan project, led by Dr. Gary Was, received a joint award from ATR NSUF and NEUP to examine whether post-irradiation annealing can mitigate the stress corrosion cracking that irradiation can trigger in reactor core materials. The work will be performed at the Microscopy and Characterization Suite (MaCS) laboratory within the Center for Advanced Energy Studies (CAES) at INL.

Two new Rapid Turnaround Experiments (RTEs) were also recently awarded. RTEs are projects that can be performed quickly (~ 2 months or less) and are low in cost. Projects are performed at either Idaho National Laboratory (INL) or one of the ATR NSUF partner facilities.

- Dr. Lizhen Tan of Oak Ridge National Laboratory (ORNL) will lead the project titled, "Stability of Precipitates under Ion Irradiation." This project will be performed using the Michigan Ion Beam Laboratory.
- Dr. Peter Hosemann of University of California, Berkeley will lead the experiment, "Characterization of Reactor Irradiated ODS Materials Using Local Electrode Atom Probe Tomography." This project will be performed in the MaCS Laboratory in CAES.

Since the user facility's inception, 47 experiments have been awarded including the latest 5. This is the first year NEUP and the ATR NSUF have collaborated on a joint solicitation. The joint process benefits the university research community by coordinating the proposal process and helping universities maintain

In the Media: Todd Allen Featured in DOE's energy.gov "10 Questions"



"Never assume that your current adventure will be your last."
~Todd Allen

ATR NSUF received a lot of media attention following our 4th Annual Users Week and the announcement of the most recently awarded projects. One highlight in the coverage was an article featuring ATR NSUF Scientific Director Todd Allen on DOE's energy.gov website "10 Questions with a Scientist." In a piece titled "10 Questions for a Nuclear Engineer: Todd Allen," Todd discusses a few of the professional hats he wears -- including working as a faculty member at the University of Wisconsin, his role at ATR NSUF, and being the director of the Center for Materials Science of Nuclear Fuel -- and what led him to the fields of nuclear engineering and materials science. The 10 Questions series on energy.gov is designed to introduce Energy Department researchers and the work they do. Read Todd's interview via this link: <http://energy.gov/articles/10-questions-nuclear-engineer-todd-allen>.



4th Annual Users Week/MeV School Joint Event, Poster Session Winners

Fifty researchers from 26 different universities and 18 countries enrolled in this year's Advanced Test Reactor National Scientific User Facility Users Week held in mid-June. Participants included 31 students, 11 faculty members, and eight representatives from industry or other labs. This year's Users Week was a joint event with Oak Ridge National Laboratory (ORNL).

The two week event began with the annual week-long Modeling, Experimentation and Validation (MeV) summer school hosted by ORNL. The MeV school provided students with an up close look at advanced materials research that is relevant to the nuclear research industry.

The following week, many of the same students traveled to Idaho National Laboratory to participate in the fourth annual Users Week at the Advanced Test Reactor National Scientific User Facility. In this second week-long course, students participated in technical sessions and laboratory tours centered on nuclear fuels research including discussions on fuel experimentation, fabrication and nano-characterization. Students also toured INL's Advanced Test Reactor, High Temperature Test Laboratory, Materials and Fuels Complex and the Center for Advanced Energy Studies (CAES).



2012 ATR NSUF Users Week participants pose on the steps of University Place in Idaho Falls, ID.



Two Users Week participants get a hands-on experience in a glove box at the Center for Advanced Energy Studies.

Users Week took a smaller group approach this year which allowed participants to have an enhanced experience with more interactive tours of INL's unique nuclear facilities and hands-on activities.

The goal of both events was to encourage the development of the next generation of nuclear scientists, engineers and researchers who will carry out the Department of Energy's vision for creating sustainable, carbon-free energy sources. In the past, the two events have been held at separate times throughout the year. This time, the sessions were held back-to-back to provide the students with a collaborative learning environment centered on two interrelated nuclear themes; materials and fuels.

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Users Week/MeV School Joint Event, Poster Session Winners Cont.

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"Combining the resources of INL and ORNL gave us the unique opportunity to provide participants with a complete, in-depth view of irradiated fuels and materials," said Jeff Benson, ATR NSUF Education Coordinator and Users Week organizer.

On Thursday, June 21, a Users Week Poster Session was held in the CAES Gallery in Idaho Falls. The poster session gave Users Week participants the opportunity to share their research with other attendees and the top three submissions were awarded certificates and cash prizes.

The ATR NSUF User Organization, Westinghouse, and Carlo U. Segre from the Illinois Institute of Technology sponsored the poster session.

Jeff Terry, of the Illinois Institute of Technology, judged the posters keeping the presenter's aggregate educational level in mind and awarding points in the following categories: Scientific/Engineering/Technology Approach (35pts), Content (10pts), Thoroughness and Understanding (20pts), Novelty of Approach (15pts), Potential Impact on the Community and/or the Public (10pts), and Clarity and Neatness of Presentation (10pts).

The three awards went to:

- **Golden Neutron Award Winner:** Heveline Vieira, Missouri University of Science and Technology, "Crystallization of Red-Mud Glasses Containing BaO, SnO, and ZrO₂" (\$400 cash award)
- **Silver Neutron Award Winner:** Karin Rudman Prieto, Arizona State University, "Statistics of Grain Boundary Crystallography in Surrogates for Oxide Nuclear Fuels" (\$250 cash award)
- **Thermal Neutron Award Winner:** Henry A. Colorado, University of California, Los Angeles, "Diverse Materials Under Extreme Environments" (\$100 cash award)

"The student posters were outstanding again this year," said Jeff Terry. "Great job by all! I hope everyone enjoyed ATR NSUF Users Week." Congratulations to the winners and thank you to everyone who participated in the poster session this year!



Missouri University of Science and Technology student, Heveline Vieira, accepts the Golden Neutron Award from judge Jeff Terry.

For more information on Users Week or the ATR NSUF, please visit <http://atrnsuf.inl.gov>.