



International Summer School

The Evolution and Impact of Microstructural Defects on In-Reactor Material Response

June 6-10, 2011 in Idaho Falls, Idaho

Hosted By:

- The Advanced Test Reactor National Scientific User Facility User's Week
- Center for Materials Science of Nuclear Fuel (CMSNF), Idaho National Laboratory

Sponsors:

- Center for Materials Science of Nuclear Fuel (CMSNF), Idaho National Laboratory
- Center for Defect Physics in Structural Materials (CDP), Oak Ridge National Laboratory
- Center for Materials at Irradiation and Mechanical Extremes (CMIME), Los Alamos National Laboratory
- Materials Science of Actinides (MSA), University of Notre Dame
- Advanced Test Reactor National Scientific User Facility, Idaho National Laboratory
- Consortium for Advanced Simulation of Light Water Reactors (CASL), Oak Ridge National Laboratory
- Department of Energy, Office of Nuclear Energy Fuel Cycle Research & Development Program

Course Goals:

The school aims to inform and educate students in the area of microstructural development in systems exposed to extreme environments found within a nuclear reactor core, such as radiation, high-temperature, high-pressure, and corrosive media, with emphasis the complex interactions between microstructural features. The one-week-long curriculum will cover a range of topics:

- Introduction to nuclear fuels
- Fundamentals of defects and radiation effects
- Fundamental approaches to modeling defects, radiation effects and microstructure evolution
- The importance of microstructures on material performance under extreme conditions
- Modern techniques in the characterization and analysis of microstructures
- The fundamental understanding of critical microstructural features such as dislocations, second phases, voids, and segregation that affect performance in extreme environments
- Complex interactions that determine microstructural evolution
- The effect of microstructure on thermal transport

Who should attend?

Undergraduate and graduate students, post doctoral researchers, faculty members, and staff scientists (particular early-career) interested in the science of the microstructure. Basic materials science background is required. The 2011 summer school welcomes both new students as well as returning students from the 2010 school in Sante Fe.

Confirmed Lecturers:

Todd Allen (University of Wisconsin); Amit Misra, Blas Uberuaga, and Kurt Sickafus (Los Alamos National Laboratory); Mike Demkowicz (Massachusetts Institute of Technology); Mitra Taheri (Drexel University); Jian Gan, Dave Hurley, and Glen Hansen (Idaho National Laboratory); James R. Morris (University of Tennessee); Roger Stoller, Steve Zinkle, Ben Larson and Yuri Osetsky (Oak Ridge National Laboratory); Gary Was (University of Michigan); Michele Manuel and Simon Phillpot (University of Florida); Don Olander (University of California, Berkeley); G. Robert Odette (University of California, Santa Barbara); Anter El-Azab (Florida State University)

Registration

The official registration site will open January 3, 2011. Log on to <http://atrnuf.inl.gov/>. For information email Jeff Benson (jeff.benson@inl.gov) or Gloria Newberry (gloria.newberry@inl.gov). Some financial assistance will be available to offset participation costs.