



Workshop on the Role of Synchrotron Radiation in Solving Scientific Challenges in Advanced Nuclear Energy Systems **27 to 28 January 2010** **at Argonne's Advanced Photon Source**

Scope

Third-generation synchrotron facilities offer unprecedented opportunities for ultra-small, ultra-fast and *in situ* measurements with high-energy, high-brilliance, x-ray beams. The capabilities provided by synchrotron radiation have had an enormous impact on resolving forefront scientific issues in the area of advanced nuclear energy systems, despite the technical difficulties in working radiological samples at a synchrotron facility. This workshop will bring together leading researchers in the field, with the following objectives:

- To discuss important scientific and technological issues in all areas of nuclear-energy systems, including fundamental electronic properties, radiological materials characterization, radiation damage studies, solution and separation chemistries, and radionuclide behavior relevant to the geosphere, that require synchrotron radiation techniques, and the potential of synchrotron radiation to address these issues.
- To encourage communication between nuclear-energy researchers and synchrotron experts to optimize the use of synchrotron techniques for discovery in areas related to advanced nuclear energy systems.
- To identify the user-community's future needs for synchrotron radiation facilities, address scientific questions of importance in nuclear-energy technology and examine the adequacy of current capabilities and the need for new facilities.

This workshop will provides an important opportunity to assist the APS with identifying their current and future synchrotron capabilities in the context of solving the pressing scientific and technological problems in advanced nuclear energy systems.



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Technical Program and Themes

Keynote Speakers

Gerry Lander (ITU, retired) – Probing Condensed Matter

Steve Zinkle (ORNL) – Radiation Damage in Fuels and Structural Materials

Mark Antonio (ANL/CSE) - Solutions and Separations Studies

Topical Areas include

- Basic actinide and fission product chemistry
- Electronic properties
- Materials characterization
- Pressure studies
- Radiation damage studies
- Separation chemistry
- Radionuclides in the environment

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