



# Institute for Materials Science

UNCLASSIFIED

## IMS Distinguished Lecture Series



**Dr. E. E. Alp**  
**Senior Scientist**  
**Advanced Photon Source**  
**Argonne National Laboratory**

### **Inelastic X-ray Scattering Studies Under High Pressure**

**Wednesday, June 22, 2016**

**2:00 - 3:00 pm**

**MSL Auditorium (TA-03 - Bldg 1698 - Room A103)**

**Abstract:** A combination of different kinds of inelastic x-ray scattering (IXS) studies with meV resolution is now available at the Advanced Photon Source. At present, Advanced Photon Source has two dedicated spectrometers for high-energy resolution ( $\Delta E = \sim 1-2$  meV) momentum-resolved IXS. Nuclear resonant scattering studies with Kr, Fe, Sn, Eu and Dy isotopes are also part of the capabilities offered. Nanogram materials under extreme conditions of pressure (1-300 GPa) and temperature (4-3000 K) can now be studied to measure valence, spin state, sound velocity, specific heat and variety of related properties.

In this talk, I will present new results on nuclear resonant studies, including isotope fractionation measurements in iron and tin compounds, kinetics of phase transformations under varying temperature and pressure in iron and its compounds, and Mossbauer Microscopy. I will highlight the use of APS Hybrid filling mode for time-resolved synchrotron Mössbauer Spectroscopy.

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**Bio:** Dr. Alp received BSc and MSc degrees from the Middle East Technical University in Ankara, and PhD from Southern Illinois University. He is a member of Argonne National Laboratory since 1984. He was a post-doctoral researcher working with the first group of scientists to prepare the scientific case for the Advanced Photon Source. He is known for his work in nuclear resonant x-ray spectroscopy using synchrotron radiation. He formed the inelastic x-ray scattering group at the APS, and he was responsible for the design and construction of the 3-ID and 30-ID beamlines, dedicated to nuclear resonant and inelastic x-ray scattering. The discovery of the nuclear resonant inelastic x-ray scattering to phonon density of states is among the highlights of this period.

Dr. Alp was a member of advisory several international synchrotron radiation centers like Canadian Light Source, SESAME project in Jordan, and Turkish Accelerator Center project. He served on beamline advisory committees for NSLS-II at Brookhaven and PETRA-III at DESY. He hosts international scientists and directs PhD theses for graduate students. His research is centered on lattice dynamics and Mössbauer Spectroscopy under high pressure.

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*Hosted by Alexander Balatsky \* Director of the Institute for Materials Science*