



MECHANICAL & MATERIAL COLLOQUIUM*

Large-Volume High-Pressure Research at GSECARS, Advanced Photon Source

by Tony Yu (University of Chicago)

The development of synchrotron-based large-volume high-pressure (LVP) techniques for studying earth, planetary, and other materials under extreme pressure and temperature (PT) conditions has been an ongoing effort at the GeoSoilEnviroCARS (GSECARS) of the Advanced Photon Source (APS). Over nearly 30 years, these developments have enabled scientists over the world to conduct coordinated research on materials in both the solid and liquid states. In this presentation we will show a few applications of our state-of-the-art techniques to scientific studies: (1) high PT ultrasonic velocity measurements on solids and liquids, (2) rheological properties of materials at high PT, (3) 3D imaging of composite materials using the high-pressure x-ray tomographic microscope, and (4) structure studies of non-crystalline materials using a Paris-Edinburgh Press combined with a multi-channel collimator. These techniques have provided the high-pressure community with a complete suite of tools for structure, density, elasticity, and viscosity measurements of earth materials.

Dr. Tony Yu is a Beamline Scientist at the Center for Advanced Radiation Sources at The University of Chicago. He is part of the Large Volume Press Group of GSECARS, which runs high-pressure and high-temperature equipment utilizing the synchrotron X-ray beam at the Advanced Photon Source, Argonne National Laboratory. His responsibilities include routine beamline operation, equipment maintenance, beamtime scheduling, user support, and new



technical development, among other tasks. A rewarding aspect of his job is collaborating with scientists from around the world on their projects. Discussing new science and brainstorming ideas to facilitate experiments keeps his brain active and his mind refreshed. Tony received his bachelor's degree in Geology from Chinese Culture University in Taiwan. He later moved to National Taiwan University, where he completed his master's degree in Geology. After acquiring a PhD in Geosciences from Stony Brook University, he began his research career at GSECARS as a postdoctoral researcher and eventually became a permanent research staff member.

Place:
MMC SIPA 100
Time:
11:00-12:00 AM
Nov. 1, 2024 (Fri)

**co-organized with Chemistry and Biochemistry*

For questions, comments and suggestions, contact Colloquium Organizers Dr. Benjamin Boesl (bboesl@fjui.edu) or Dr. Jiu-hua Chen (chenj@fjui.edu)