



COMPRES Beamline Scientists

This month we highlight our eight beamline scientists stationed at COMPRES supported synchrotron facilities: Advanced Light Source (ALS) Lawrence Berkeley Laboratory, Advanced Photon Source (APS) Argonne National Laboratory, and National Synchrotron Light Source-II (NSLS-II) Brookhaven National Laboratory. COMPRES beamline scientists are crucial to the success of the users who conduct high-pressure experiments at these synchrotrons. They administer and operate the user facility and are responsible for nearly all aspects of beamline operation and user service. This includes ensuring beamline stability and efficiency, establishing close interactions with user community, essential equipment maintenance, and development of best practices and procedures to maximize user success. Beamline scientists also typically contribute innovative new infrastructure enhancements, and carry out their own original research projects.

Christine Beavers

COMPRES Beamline Scientist, Lawrence Berkeley Laboratory, University of California Santa Cruz (UCSC)

Christine Beavers is a COMPRES beamline scientist at Beamline 12.2.2, Advanced Light Source. This beamline enables monochromatic X-ray diffraction experiments at high pressures and temperatures using the diamond anvil cell. 12.2.2 offers the ability to study mechanical strength, deformation and texture development at ultra-high pressures using the radial diffraction technique. The facility has a new, completely redesigned temperature measurement system allowing measurements of thermoelastic equations of state and pressure-temperature phase stability.

Christine received a B.S. (2004) in Chemistry and a Ph.D. (2008) in Analytical Chemistry at UC Davis. She has been a Beamline Scientist at the ALS 12.2.2 since 2013.

<https://als.lbl.gov/people/christine-beavers/>



Wenli Bi

COMPRES Beamline Scientist, Argonne National Laboratory, University of Illinois at Urbana-Champaign (UIUC)

Wenli Bi is a COMPRES beamline scientist at the APS Inelastic X-Ray Scattering Facilities at Sector 3. The facility features DAC synchrotron-based spectroscopy techniques harnessing the inelastic x-ray scattering behavior of ^{57}Fe at extreme temperatures and pressures. This suite of techniques, which includes Nuclear Resonant Inelastic X-ray scattering (NRIXS) and High Energy Resolution Inelastic X-Ray Spectrometry (HERIX-3), can be used to probe sound velocities, spin state, site occupancy, and vibrational properties of iron in metals and oxides relevant to the deep Earth.

Wenli received a B.S. at Xi'an Jiaotong University, China, a M.S. (2006) in Physics at Drexel University, and a Ph.D. (2011) in Experimental Condensed Matter Physics at Washington University in St. Louis. She has been in spectroscopist research positions at the APS since 2011.

wbi@aps.anl.gov

Haiyan Chen

COMPRES Beamline Scientist, Argonne National Laboratory, Stony Brook University

Haiyan Chen is the COMPRES beamline scientist at 6-BM-B at the Advanced Photon Source (APS). This beamline is a dedicated high pressure multi-anvil facility equipped with a 250-ton hydraulic press with DIA, Deformation-DIA, and T-cup pressure modules. This beamline provides experimental capabilities for studying hydrostatic and dynamic phase transformations, equations-of-state, melting processes, steady-state and dynamic rheological properties, as well as transport, thermal, elastic, and acoustic properties.

Haiyan received a M.S. (1992) in Chemistry at Wuhan University, China, and a Ph.D. (2005) in Chemistry at Georgia Institute of Technology. She has been a Research Scientist at Stony Brook University since 2011.

haiyan@bnl.gov



Zhenxian Liu

COMPRES Beamline Scientist, Brookhaven National Laboratory, George Washington University

Zhenxian Liu is a COMPRES beamline scientist at the NSLS-II Beamline Frontier Infrared Spectroscopy (FIS) Facility for Studies under Extreme Conditions. The infrared beamline is among the high-priority "NextGen" beamlines and is scheduled to deliver beam in 2018, and will provide a facility dedicated to high-pressure infrared (IR) measurements using the DAC, offering the flux and spatial resolution necessary to study volatiles in challenging samples from nature requiring micrometer spatial resolution. Capabilities include studies of the presence and structural state of water in minerals, thermodynamic properties, electronic structure, and thermal conductivity at extreme conditions.

Zhenxian received a Ph.D. (1992) at Jilin University in China. He has been Research Professor at GWU since 2017, and Co-I on the COMPRES FIS sub-award since 2016.

zxliu@bnl.gov

Matt Whitaker

COMPRES Beamline Scientist, Brookhaven National Laboratory, Stony Brook University

Matt Whitaker is the COMPRES beamline scientist at NSLS-II beamline XPD-D end station, that features a 1100-ton hydraulic press designed for high pressure and high temperature multi-anvil experiments. The standard pressure module that will be in use in this press is the DT-25, which is a differential Kawai-type multi-anvil system that is capable of achieving pressures ranging from the crust through the transition zone to lower mantle pressures. This module is the first of its kind in the world, and will permit new experiments not possible at any other beamline. Research will be in the areas of rheology and ultrasonic sound velocity measurements at high pressures and temperatures.

Matt received a B.S. (2002) in Geological Sciences at SUNY New Paltz, and a Ph.D. (2009) in Mineral Physics & Geochemistry at Stony Brook University. He has been Co-PI on the COMPRES Stony Brook sub-award since 2016.

matthew.whitaker@stonybrook.edu



Sergey Tkachev

COMPRES/GSECARS Beamline Scientist, Argonne National Laboratory,
University of Chicago

Sergey Tkachev is a COMPRES/GSECARS beamline scientist who manages the Gas Loading Facility at the Advanced Photon Source (APS). The Gas Loading System is a partnership between COMPRES and GSECARS which provides both an in-house and a mail-in service to load diamond anvil cells with a variety of hydrostatic gas pressure media such as neon or helium. This facility is used by scores of diamond cell researchers regardless of whether they are performing experiments at GSECARS, at another APS sector, at another synchrotron, or in their home laboratory. Sergey has been in this position since 2012.

tkachev@cars.uchicago.edu



Jinyuan Yan

COMPRES Beamline Scientist, Lawrence Berkeley Laboratory, University of California
Santa Cruz (UCSC)

Jinyuan Yan is a COMPRES beamline scientist at Beamline 12.2.2, Advanced Light Source (ALS). This is a dedicated DAC high-pressure diffraction beamline. It focuses on double-sided in-situ laser heating (for axial as well as radial diffraction geometry) and high-pressure single crystal diffraction. The beamline operates on two end-stations where end-station-1 is currently rebuilt to accommodate a 4-circle single crystal diffractometer with an RD CMOS detector. End-station-2 hosts the in-situ laser heating set up with a choice of image plate and fast pixel detector. Users have a fully equipped (microscopes, laser-mill, gas-loader) preparation lab available for use.

Jinyuan received a Ph.D. (2005) in Nuclear Engineering at North Carolina State University. He has been a beamline scientist at APS since 2006.

jyan@lbl.gov



Dongzhou Zhang

COMPRES Beamline Scientist, Argonne National Laboratory, University of Hawaii

Dongzhou Zhang is the COMPRES beamline scientist at the Partnership for eXtreme Xtallography (PX²) facility which is a collaboration between COMPRES and GSECARS. Located at the APS 13BM-C end station, the facility provides high energy monochromatic X-rays for a variety of diffraction techniques to examine mineral structures at high pressures in the diamond anvil cell. This beamline is optimized for a variety of advanced crystallography experiments including powder and single crystal structure determination, equation of state studies, and thermal diffuse scattering.

Dongzhou received a B.S. (2008) in Physics from Peking University, China, and a Ph.D. (2014) in Geophysics at the California Institute of Technology. In 2015 he received the AGU Mineral and Rock Physics Graduate Research Award.

dzhang@hawaii.edu



Contact: Dr. Carl Agee
COMPRES President
agee@unm.edu
505-750-7172
www.compres.us



The National Science Foundation supports COMPRES under NSF Cooperative Agreement EAR-1661511. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1661511