



PHYSICS SEMINAR SERIES:

New Lens on the Frontier of Matter in Extreme Conditions

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SLAC National Accelerator Laboratory / Stanford University

Date:
9/15/2023

Time:
10:30 AM – 11:50 AM

Location:
GRAN 135

About The Speaker:

Arianna Gleason received her undergraduate degree in Geosciences from the University of Arizona, Tucson in 2003. There she worked for the Spacewatch Project discovering Near Earth Objects and discovered Comet Gleason. She received her Ph.D. in Earth and Planetary Science from the University of California, Berkeley in 2010. She joined Stanford University as a postdoctoral scholar in 2010 and then worked for Los Alamos National Laboratory in the Shock and Detonation Physics group before joining SLAC National Accelerator Laboratory as a staff scientist in 2018. Her work focuses on visualizing materials behavior and response across all length-scales at the most extreme environments possible in nature – from depths of the Earth’s crust to planetary cores and even stellar interiors. Her studies center on high-pressure mineral physics and planetary evolution from the atomic level up. In 2019 she received the Department of Energy’s Early Career Award from the Office of Science, Fusion Energy Science and recently became the Deputy Director for the High Energy Density Science Division at SLAC.



Abstract:

The study of matter under extreme conditions is a highly interdisciplinary subject with broad applications to materials science, plasma physics, geophysics and astrophysics. Understanding the processes which dictate physical properties in warm dense plasmas and condensed matter, requires studies at the relevant length-scales (e.g., interatomic spacing) and time-scales (e.g., phonon period). Experiments performed at X-ray Free Electron Laser (XFEL) lightsources across the world, combined with dynamic compression, provide ever-improving spatial- and temporal-fidelity to push the frontier. This talk will cover a very broad range of conditions, and give examples of case-studies closely related to geophysics, astro(bio)physics, planetary-, and fusion energy-sciences, as enabled by novel, ultrafast X-ray probes. Opportunities for expanded engagement across UCMerced and SLAC, including science and technology student projects, internships and early career programs will be discussed.

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