From Atomic Units to Astronomical Units: Computational Modeling Paradigms for Unraveling the Materials universe

Abstract: Computational materials science and engineering paradigms have attained a level of maturity such that they can be reliably implemented for the discovery, design, development, and deployment of materials for a wide variety of engineering and technological applications. Of equal significance is their importance as an interrogation tool for interpreting the composition-microstructure-origin inter-relations of planetary materials. In this regard, in this talk, using examples that span diverse research areas that include advanced manufacturing, photonics, phononics, energy, construction, and cosmochemistry, the versatility of computational materials science paradigms will be illustrated, with a strong emphasis on their importance as indispensable research tools for the next (and current) generation of engineers and technologists.

Bio: Krishna Muralidharan is an associate professor in the department of Materials Science and Engineering at the University of Arizona, with joint appointments at the Lunar and Planetary Laboratory, and the Graduate Interdisciplinary Program in Applied Math. His research focuses on implementing integrated computational materials engineering paradigms to push the frontiers of additive manufacturing, multiscale energy storage systems, and planetary materials analysis. Muralidharan got his PhD from the University of Arizona in 2004, and prior to joining the University of Arizona as a faculty member, he worked at Los Alamos National Laboratory and the University of Florida.

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Zoom link: Email eperumala@arizona.edu