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4:00 p.m. / 202 Reed McDonald Building

Modeling and Simulation of Hypersonic Reacting Flows using Particle Approaches

ABSTRACT
The fundamental modeling of hypersonic vehicle flight and materials covers diverse, cross disciplinary research areas in high temperature gas dynamics and chemistry. In the last few years, particle and kinetic approaches such as direct simulation Monte Carlo and quasi-classical trajectory/molecular dynamics have begun to offer new insights into traditional aerospace systems as well as in non-traditional applications. The seminar will provide an overview of the theory and methodology of particle approaches, the challenges of their computational expense, examples of three examples from extreme to low Mach number flows and the interconnection of the flow gas dynamics with radiation in the vacuum to ultraviolet spectral region.

BIO
DEBORAH A. LEVIN, Professor of aerospace engineering at the Pennsylvania State University (PSU), received her Ph.D from the California Institute of Technology in chemistry. Before joining PSU in 2000, she held positions at the Institute for Defense Analyses and George Washington University. Her recent research centers concentrates on the modeling of chemically reacting hypersonic flows, radiation from hypersonic flows, and kinetic gas dynamic approaches related to the direct simulation Monte Carlo method. She has been a member of the AIAA Plasmadynamics and Lasers Technical Committee since 1994 and is a past-chair. She is a Fellow of the AIAA, associate editor of the Journal of Thermophysics and Heat Transfer, and has co-authored over 110 archival journal articles.

Refreshments will be served at 3:45 p.m.