

# Physics Colloquium

**Professor Bhuvana Srinivasan**

(Aerospace and Ocean Engineering, Virginia Tech)

**“Numerical Studies of High-energy Density Fusion and  
Astrophysical Plasmas”**

**Friday, December 6, 2019**

**2:30pm—3:30pm**

**130 Hahn Hall North**

Experimental efforts to study nuclear fusion and astrophysical plasmas have produced significant scientific advances but remain challenged by diagnostic access and limitations. Hence, there is a need for high-fidelity computational models in plasma physics to support experiments. Plasma physics will be introduced in this talk along with a brief description of plasma models and their limitations. Recent advances in plasma fluid and kinetic modeling have supported development of sophisticated simulation tools. A hierarchy of models, ranging from magnetohydrodynamic (MHD) to fully kinetic, are developed and applied across a wide range of parameter regimes in the Plasma Dynamics Computational Laboratory at Virginia Tech. Some representative applications will be presented with a focus on high-energy-density plasmas for fusion and astrophysical studies. Other research topics being pursued in the computational laboratory will be discussed briefly.