

Numerical Simulation of Plasmas

Organizer: Professor Vish Subramaniam, Department of Mechanical Engineering
The Ohio State University

This symposium will focus on numerical simulation and modeling of plasmas used in a variety of applications from space propulsion and welding to fabrication of semiconductor devices. Plasmas are ionized gases in which chemical reactions can be driven and controlled to some extent using electric and magnetic fields. The majority of these plasmas exhibit various departures from thermodynamic equilibrium, with ionization levels ranging from weak to fully ionized regimes, and with pressures ranging from low (on the order of mTorr) to high (atmospheric pressure). Computational modeling of plasmas can provide useful guidelines to improve device or process designs and aid in scale-up of existing processes. Computational tools for simulating process plasmas are finding increasing use in the semiconductor fabrication industry. Continuum through rarefied regimes are being explored using fluid models and kinetic models, employing finite-difference, finite-element, and Monte Carlo methods. There will be two invited speakers, one representing low-pressure plasmas and the other representing higher pressure plasmas.