# Computational Models for Nanosecond Laser Ablation

Dr. Harihar Khanal,
Department of Mathematics Embry-Riddle
Aeronautical University, Florida, USA

Laser ablation in an ambient environment is becoming increasingly important in science and technology. It is used in applications ranging from chemical analysis via mass spectroscopy, to pulsed laser deposition and nanoparticle manufacturing. We describe numerical schemes for a multiphase hydrodynamic model of nanosecond laser ablation expressing energy, momentum, and mass conservation in the target material, as well as in the expanding plasma plume, along with collisional and radiative processes for laser-induced breakdown (plasma formation). Numerical simulations for copper in a helium background gas are presented and the efficiency of various ODE integrators is compared.