1135-76-2477 **Yan Peng*** (ypeng@odu.edu), 4700 Elkhorn Ave., Norfolk, VA 23693, and **Charles Armstrong**.
*Study of Bioparticle Transport Using Lattice Boltzmann Method and Immersed Boundary Method.* Preliminary report.

This talk will present a computational framework to simulate bioparticle transport involving complex fluid-structure interactions. The lattice Boltzmann equation (LBE) is used to model the fluid motion because of its accuracy (low dissipation/low dispersion and better isotropy) and computational advantages including its excellent parallel scalability, absence of the need to solve a time consuming elliptic Poisson-type equation for the pressure field, and ease of representation of complex boundaries on Cartesian grids. The immersed boundary method (IBM) is chosen to track the deformable moving boundaries for its ease of implementation without re-meshing to generate the body-fitted mesh. The full approximation storage (FAS) non-linear multigrid method for steady and unsteady state problems has been proposed to improve the computational efficiency and keep the original characteristics of the LBE. One of the main motivations for this study comes from the Lab-on-a-chip (LoC) application, important for bio-medical, pharmaceutical, and environmental industries. Some numerical results of flow-induced deformation of a red blood cell from shear flow are presented. One or more orders of magnitude increase in solution efficiency using multigrid method is demonstrated. (Received September 26, 2017)