

1136-65-446

**Noel J. Walkington\*** (noelw@andrew.cmu.edu). *Numerical Approximation Nematic Fluids.*

This talk focuses on the issues that arise when modeling and simulating fluids containing rod-like molecules (nematics). The (average) orientation of these fluids is typically modeled by a unit vector field which complicates both the analysis and numerical solution of these equations. In particular,

- The unit length constraint gives rise to topological singularities. While singularities are observed ubiquitously in liquid crystals, classical models assign infinite elastic energy to these configurations.
- The head-to-tail symmetry of the nematic molecules allows them to form non-orientable direction fields and degree half singularities, so director take values in real projective space.

The development of numerical schemes in this context will be discussed. (Received January 21, 2018)