

1129-65-205      **Noel J Walkington\*** ([noelw@andrew.cmu.edu](mailto:noelw@andrew.cmu.edu)), Carnegie Mellon University, 5000 Forbes Ave,  
Pittsburgh, PA 15213. *Numerical Approximation of Complex Fluids.*

Many models of polymers, liquid crystals, and fluids with multiple phases, consist of the momentum equation coupled to equations for internal variables which characterize fine scale structures and phases formation. Examples include the Ericksen–Leslie model of liquid crystals with nematic and isotropic regions and the Oldroyd–B fluid. The variational structure of these equations models the subtle balance between inertia, transport, and dissipation. This talk will illustrate how the underlying variational structure of these equations can be used to develop stable numerical schemes to simulate these systems and the corresponding numerical analysis. (Received March 15, 2017)