Computational Mathematics Seminar Series

## Numerical Analysis of Convex Splitting Schemes for Cahn-Hilliard and Coupled Cahn- Hilliard-Fluid-Flow Equations

**Amanda Diegel, Louisiana State University**

Digital Media Center 1034
September 15, 2015 - 03:30 pm

**Abstract:**

In this talk, we investigate numerical schemes for the Cahn-Hilliard equation and the Cahn-Hilliard equation coupled with a Darcy-Stokes flow. Considered independently, the Cahn- Hilliard equation is a model for spinodal decomposition and domain coarsening. When coupled with a Darcy-Stokes flow, the resulting system describes the flow of a very viscous block copolymer fluid. Challenges in creating numerical schemes for these equations arise due to the nonlinear nature and high derivative order of the Cahn-Hilliard equation. Further challenges arise during the coupling process as the coupling terms tend to be nonlinear as well. The numerical schemes which will be presented preserve the energy dissipative structure of the Cahn-Hilliard equation while maintaining unique solvability and optimal error bounds.

---

**Speaker's Bio:**

Amanda is a native of Knoxville, TN where she earned her undergraduate and graduate degrees from the University of Tennessee. Her graduate thesis was in the area of numerical analysis with specific concentration on convex splitting schemes for Cahn-Hilliard and Coupled Cahn-Hilliard-Fluid-Flow equations. She is generally interested in the analysis of finite element methods applicable to a wide range of problems and is excited to begin working with the computational group at CCT.

---

**This lecture has refreshments @ 03:00 pm**
**This lecture has a reception @ 03:00 pm**



Center for Computation & Technology
2003 Digital Media Center • Telephone: +1 225/578-5890 • Fax: +1 225/578-8957