

ACMS Applied Math Seminar

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Science and Technology
Thursday, April 14, 2022
154 Hurley Hall
3:30 PM – 4:30 PM**



Modeling and Numerical Methods For Two-phase Flows In Superposed Free Flow and Porous Media

In this talk we introduce a diffuse interface model for two-phase flows in superposed free flow and porous media. The model consists of the Cahn-Hilliard-Navier-Stokes equations in free flow and the Cahn-Hilliard-Darcy equations in porous media coupled through a set of domain interface boundary conditions. We establish global existence of weak solutions as well as weak-strong uniqueness. We then present a first-order decoupled unconditionally stable numerical method for solving the model. Finally, we discuss recent progress in the design of super convergent hybridizable discontinuous Galerkin method for solving the Cahn-Hilliard type equations.

The Department of Applied and Computational
Mathematics and Statistics

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