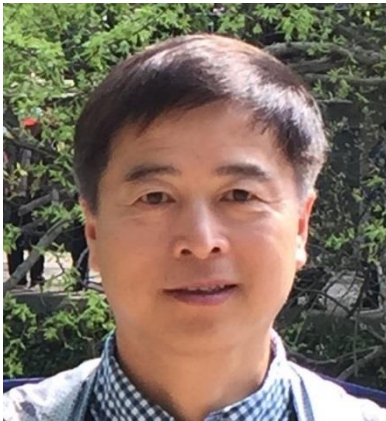


***Phase-field models for multiphase complex fluids:
modeling, numerical analysis and simulations***



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Abstract: I shall present some recent work on phase-field model for multiphase incompressible flows. We shall pay particular attention to situations with large density ratios and with non-Newtonian components as they lead to formidable challenges in both analysis and simulation.

I shall present unconditionally energy stable, decoupled numerical schemes which only require solving a sequence of linear elliptic equations at each time step for solving this coupled nonlinear system, and show ample numerical results which not only demonstrate the effectiveness of the numerical schemes, but also validate the flexibility and robustness of the phase-field model.

Biographical Sketch: Professor Jie Shen received his B.S. in Computational Mathematics from Peking University in 1982, and his Ph.D in Numerical Analysis from Universite de Paris-Sud at Orsay in 1987. Before joining the Purdue Faculty in Fall 2002, he served as Professor of Mathematics at Penn State University and University of Central Florida. Since Jan. 2012 he serves as the Director of Center for Computational and Applied Mathematics at Purdue University.

He is a recipient of the Fulbright award in 2008 and the Inaugural Research Award of the College of Science at Purdue University in 2013, and an elected Fellow of AMS. He serves on editorial boards for several leading international research journals, and has authored/coauthored over 160 peer-reviewed research articles and two books. His main research interests are numerical analysis, spectral methods and scientific computing with applications in computational fluid dynamics and materials science.