Differential Equations and Applied Math Seminar

Texas State University

2-3pm February 13, 2015

329 Derrick Hall

Speaker: Dr. Hunseok Kang, Soongsil University, Seoul, Korea

Title: Non-local Three Species Models for Wormlike Micellar Fluids

Abstract: We present new population dynamics-based three species model for modeling wormlike micellar fluids, in which the gelation species is taken into account. In this talk, we fully investigate the homogeneous model of wormlike micellar fluid both theoretically and numerically and show that the model is globally stable and approach to the steady state for any legitimate initial conditions. Furthermore, we extend the model to the partial differential equation to incorporate the spatial dependence of the species in the model. Their inhomogeneous effects for the flow behavior have also been modeled by including populations as a polymeric viscosity, whose idea is from the micro-macro modeling of generic polymeric fluids models. Using the newly proposed inhomogeneous three species model, we tackle the challenge to model the shear thickening transition observed in experiments. This is a joint work with Dr. Y-J. Lee.

Interested faculty and graduate students are encouraged to attend.