

Instabilities on the nanoscale: Breakup and phase separation of multicomponent films

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This project focuses on modeling and simulations of thin films on the nanoscale. Modeling involves coupling two effects of different origins: dewetting (film breakup) and phase separation, or demixing (in the case of immiscible components). The problem will be considered by using the underlying Navier-Stokes equations, and by exploring the long wave limit, coupled with the appropriate formulation for demixing. The computational component will involve further development of GPU-based computing software that was previously developed at NJIT. The project will be carried out as a joint effort with the experimental group located at Oak Ridge National Laboratory and University of Tennessee, and a collaborating research group in Argentina. The participating student will be expected to work and communicate with the researchers from both groups, including travel for work and study visits.