A Navier–Stokes/Mullins–Sekerka system with different densities: weak solutions

Andrea Poiatti (Universität Wien)

In this talk, I would like to introduce a model for the flow of two incompressible, viscous and immiscible fluids in a bounded domain, with different densities and viscosities. This model consists of a coupled system of Navier–Stokes and Mullins–Sekerka type parts, and can be obtained from the asymptotic limit of the diffuse interface model introduced by Abels, Garcke, and Grün in 2012. I will introduce a new notion of weak solutions and prove its global in time existence, together with a consistency result. This new notion of solution allows to include the case of different densities of the fluids, a sharp energy dissipation principle à la De Giorgi, as well as a weak formulation of the constant contact angle condition at the boundary, which were left open in the previous notion of solution proposed by H. Abels and M. Röger in 2009. This is a joint project with H. Abels.