The nonlocal Cahn-Hilliard-Hele-Shaw system with regular and singular potential

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The Cahn-Hilliard-Hele-Shaw system (also called the Cahn-Hilliard-Darcy system) can be used to describe the evolution of binary immiscible fluids in a Hele-Shaw cell or in porous media, and has been recently used as a building block for some tumor-growth models. In my talk, I will introduce a physically motivated nonlocal variant of the Cahn-Hilliard-Hele-Shaw system, and present some related analytical results. These include the well-posedness of the system, the existence of a global attractor, and the convergence of solutions to equilibria as time goes to infinity (in the two-dimensional case). We discuss both the case with regular and singular potential.