

Clemens Gohlke

Sharp limit of the viscous Cahn-Hilliard equation in the context of the 2nd law of thermodynamics

The lecture addresses the relations of phase field models and sharp interface models in the context of phase transitions. In particular we consider the corresponding entropy inequalities of the two settings. To this end we study the formal sharp limit of a single Cahn-Hilliard equation in one space dimension. While the Cahn-Hilliard equation induces a non-negative entropy production, the resulting sharp limit procedure leads to a negative interfacial entropy production. We solve this paradoxical behavior by a viscous regularization.