

PHYSICAL MATHEMATICS SEMINAR

Consistent hydrodynamics for phase field crystals

VILI HEINONEN

Massachusetts Institute of Technology

ABSTRACT:

Phase field crystal (PFC) models have become a widely used computational tool for modeling the microstructure of crystals at diffusive time scales. PFC models manage to incorporate a reasonably accurate description of e.g. liquid-solid boundary energy, topological defects, and elastic properties in a relatively simple theory. In this talk I will give a short introduction to a coarse-grained amplitude expansion framework of the PFC model and briefly explain some limitations of overdamped dynamics - a staple of dynamical studies in the diffusive time scale. In order to try to overcome these limitations, I will reformulate the dynamics for the model by coupling the system with a hydrodynamic velocity field. In the end I will make an attempt to convince the audience that this approach is reasonable by showing some analytical and numerical results.

TUESDAY, SEPTEMBER 12, 2017

2:30 PM

Building 2, Room 142

*Reception following in Building 2, Room 290
(Math Dept. Common Room)*

<http://math.mit.edu/seminars/pms/>