

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Weizhu Bao**

( *Department of Mathematics, National University of Singapore* )

报告题目:

**Modeling and Simulation for  
Solid-State Dewetting Problems**

邀请人: 明平兵 研究员

报告时间: 2016 年 6 月 22 日 (周三)

上午 10:00-11:00

报告地点: 数学院南楼七层

702 会议室

## **Abstract:**

In this talk, I will present sharp interface models with anisotropic surface energy and a phase field model for simulating solid-state dewetting and the morphological evolution of patterned islands on a substrate. We will show how to derive the sharp interface model via thermovariation dynamics, i.e. variation of the interfacial energy via an open curve with two triple points moving along a fixed substrate. The sharp interface model tracks the moving interface explicitly and it is very easy to be handled in two dimensions via arc-length parametrization. The phase field model is governed by the Cahn-Hilliard equation with isotropic surface tension and variable scalar mobility and it easily deals with the complex boundary conditions and/or complicated geometry arising in the solid-state dewetting problem. Since the phase field model does not explicitly track the moving surface, it naturally captures the topological changes that occur during film/island morphology evolution. Efficient and accurate numerical methods for both sharp interface models and phase field models are proposed. They are applied to study numerically different setups of solid-state dewetting including short and long island films, pinch-off, hole dynamics, semi-infinite film, etc. Our results agree with experimental results very well. This is joint works with Wei Jiang, David J. Srolovitz, Carl V. Thompson, Yan Wang and Quan Zhao.

**欢迎大家参加！**