

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:

**Phase Field Approach for Simulating  
Solid-State Dewetting Problems**

邀请人: 明平兵 研究员

于海军 副研究员

报告时间: **2017 年 4 月 25 日 (周二)**

**上午 10:00-11:00**

报告地点: 数学院南楼九层

**902 教室**

## **Abstract:**

In this talk, I will present a phase field model for simulating solid-state dewetting and the morphological evolution of patterned islands on a substrate. The evolution is governed by the Cahn-Hilliard equation with isotropic surface tension and variable scalar mobility. The proposed approach easily deals with the complex boundary conditions arising in the solid-state dewetting problem. Since the method does not explicitly track the moving surface, it naturally captures the topological changes that occur during film/island morphology evolution. The numerical method is based on the cosine pseudospectral method together with a highly efficient, stabilized, semi-implicit algorithm. Numerical results on solid-state dewetting in two dimensions (2D) demonstrate the excellent performance of the method, including stability, accuracy and numerical efficiency. The method was easily extended to three dimensions (3D), with no essential difference from the 2D algorithm. Numerical experiments in 3D demonstrate the ability of the model to capture many of the complexities that have been observed in the experimental dewetting of thin films on substrates and the evolution of patterned islands on substrates. This is a joint work with Wei Jiang, David J. Srolovitz and Carl V. Thompson.

**欢迎大家参加！**