



The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Applied Mathematics

**Primary and secondary structures of
inhibitory geometric variational problems**

by

Prof. Xiaofeng Ren

The George Washington University

Abstract

In this talk we discuss a geometric variational problem with inhibitory long range interaction. It is a ternary system originally proposed to model triblock copolymers. There exists a morphological phase of a double bubble assembly as a stable stationary point of the variational problem. While the locations of the double bubbles in the assembly are determined in an earlier analytical result, the directions of the double bubbles are studied by a recent numerical computation. One of the conditions for the existence of the double bubble assembly is that the two by two nonlocal interaction matrix parameter is positive definite and a bound is assumed on the ratio of the two eigenvalues of the matrix. A more complete study of the interaction matrix shows that the double bubble assembly may lose to a disc assembly as the two eigenvalues become less comparable. When the matrix becomes indefinite, there appears a stationary disc assembly whose primary structure is the microscopic disc. It also has a secondary structure that the discs of one type are separated from discs of the second type by a macroscopic interface.

Date: Wednesday, 27 June 2018

Time: 3:00p.m. – 4:00p.m.

**Venue: Room 4475, Academic Buildings
(Lifts 25, 26), HKUST**

All are welcome!