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SHANGHAI

纽约大学

NYU-ECNU

Institute of Mathematical Sciences
at NYU Shanghai

ANALYSIS/PDE SEMINAR SERIES

TOPIC: Solvability of the 2-D Stokes Immersed Boundary Problem

SPEAKER: Jiajun Tong, New York University

TIME: 2:00pm-3:00pm, Thursday, November 23, 2017

VENUE: Room 264, Geography Building, Zhongbei Campus
(华东师范大学中山北路校区, 地理楼 264 室)

HOST: Yuning Liu, NYU Shanghai

ABSTRACT OF THE TALK

We consider a 1-D closed elastic string immersed in the 2-D Stokes flow, and study their coupled motion. This problem is known as the 2-D Stokes Immersed Boundary Problem, featuring singular forcing supported on a free-moving boundary. We will first show how to reformulate the problem into a nonlinear integral evolution equation solely keeping track of the string configuration. Then we establish its local well-posedness under mild regularity and geometric assumptions on the initial string configuration. We will also discuss the global well-posedness as well as the exponential convergence to equilibria, provided that the initial string configuration is sufficiently close to an equilibrium.

BIOGRAPHY

Jiajun Tong is a fifth-year Ph.D. student in mathematics at New York University. Before coming to NYU, he received B.S. in applied and computational mathematics in Peking University in 2013. His research interest lies in PDE and numerical analysis arising in fluid dynamics in general. He is working with Prof. Fang-Hua Lin on PDEs in liquid crystal, complex fluids and flow-structure interaction problems. He is also working with Prof. Michael Shelley on modeling and simulating active swimmers.