NYU-ECNU
Institute of Physics
at NYU Shanghai

SERIES

INSTITUTE FACULTY TALK

MAC HUANG NYU SHANGHAI | MAY 26, WEDNESDAY AT 9^{00}-10^{00} AM, VIA ZOOM

RSVP HERE

About the Faculty

Jinzi Mac Huang is an Assistant Professor of Mathematics at NYU Shanghai. Interested in experimental fluid dynamics and applied mathematics, he collaborates with the Applied Math Lab at the Courant Institute, the Applied Math Lab Shanghai at NYU Shanghai, and the Joint Physics Lab at NYU-ECNU Institute of Physics.

About the Talk

Mass Transfer Through Fluid-Structure Interactions

In this talk, we focus on the interplay between applied math and the experiments of fluid-structure interactions, which are fascinating problems due to their physical relevance and mathematical complexity. Examples of such problems include the geophysically inspired study of the dissolution process in fluid flow, where the dissolution of a soluble object is studied experimentally and numerically. We are able to sketch mathematical answers to some long standing questions like the formation of stone forests in China and Madagascar, and, how many licks does it take to get to the center of a lollipop. We will also talk about the micro-scale mass transport process of diffusio-phoresis, where colloidal particles are advected by the concentration gradient of salt in the fluid. In a micro maze, if the fluid carries salt with high concentration at the exit and low concentration at the entrance, the colloids are able to solve this maze by going along the concentration gradient. We further demonstrate that their ability of solving the maze is closely associated with the properties of a harmonic function – the salt concentration.