



Institute for Computational and Experimental Research in Mathematics

SPRING SEMESTER 2017

Singularities and Waves in Incompressible Fluids

January 30 – May 5, 2017

Organizing Committee:

Bernard Deconinck, *University of Washington*

Yan Guo, *Brown University*

Diane Henderson, *Pennsylvania State University*

Helena Nussenzveig Lopes, *Federal University of Rio de Janeiro*

Govind Menon, *Brown University*

Paul Milewski, *University of Bath*

Walter Strauss, *Brown University*

Jon Wilkening, *University of California - Berkeley*

Program Description:

Incompressible fluids are an abundant source of mathematical and practical problems. The question of global-in-time regularity versus finite-time singularity formation for incompressible fluids, governed by the Navier-Stokes or Euler equations, has been one of the most challenging outstanding problems in applied PDE. There have also been new developments in the study of the onset of turbulence due to linear and nonlinear instabilities in incompressible fluids. Interfacial and surface water waves are physical phenomena that, in addition to the challenges outlined above, involve the evolution of free boundaries. These problems embody many of the mathematical challenges found in studies of nonlinear PDEs.

Topics of particular interest to be covered in three related workshops include: singularity formation, stability and bifurcation; the modeling and analysis of simplified phenomenological models for the description of coherent structures; and time-dependent and steady free boundary problems including water waves, vortex sheets, capillary problems with contact lines and viscous waves with boundary layers. *DETAILS AT: icerm.brown.edu.*

Ways to participate:

Propose a:

- semester program
- topical workshop
- small group research program
- summer undergrad program

Apply for a:

- semester program or workshop
- postdoctoral fellowship

Become an:

- academic or corporate sponsor

About ICERM: The Institute for Computational and Experimental Research in Mathematics is a National Science Foundation Mathematics Institute at Brown University in Providence, RI.

icerm.brown.edu



BROWN