



Image courtesy of David Goluskin

MATHEMATICS OF TURBULENCE

September 8 – December 12, 2014

ORGANIZING COMMITTEE: Charlie Doering (University of Michigan), Gregory Eyink (Johns Hopkins University), Pascale Garaud (UC Santa Cruz), Michael Jolly (Indiana University), Keith Julien (University of Colorado), Beverley McKeon (Caltech)

Scientific Overview

Turbulence is perhaps the primary paradigm of complex nonlinear multi-scale dynamics. It is ubiquitous in fluid flows and plays a major role in problems ranging from the determination of drag coefficients and heat and mass transfer rates in engineering applications, to important dynamical processes in environmental science, ocean and atmosphere dynamics, geophysics, and astrophysics. Understanding turbulent mixing and transport of heat, mass, and momentum remains an important open challenge for 21st century physics and mathematics.

This IPAM program is centered on fundamental issues in mathematical fluid dynamics, scientific computation, and applications including rigorous and reliable mathematical estimates of physically important quantities for solutions of the partial differential equations that are believed, in many situations, to accurately model the essential physical phenomena.

Workshop Schedule

- Mathematics of Turbulence Tutorials: September 9 - 12, 2014.
- Workshop I: Mathematical Analysis of Turbulence. September 29 - October 3, 2014.
- Workshop II: Turbulent Transport and Mixing. October 13 - 17, 2014.
- Workshop III: Geophysical and Astrophysical Turbulence. October 27 - 31, 2014.
- Workshop IV: Turbulence in Engineering Applications. November 17 - 21, 2014.
- Culminating Workshop at Lake Arrowhead Conference Center, December 7 – 12, 2014.

Participation

This program will bring together physicists, engineers, analysts, and applied mathematicians to share problems, insights, results and solutions. Enhancing communications across these traditional disciplinary boundaries is a central goal of the program.

Full and partial support for long-term participants is available. We are especially interested in applicants who intend to participate in the entire program (September 8 – December 12, 2014), but will consider applications for shorter periods. Funding is available for participants at all academic levels, though recent PhDs, graduate students, and researchers in the early stages of their careers are especially encouraged to apply. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission and we welcome their applications. More information and an application is available online.

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