INSTITUTE FOR PURE AND APPLIED MATHEMATICS

Los Angeles, California

Numerics and Dynamics of Optimal Transport

April 14 – 18, 2008

ORGANIZING COMMITTEE: **Yann Brenier** (Université de Nice Sophia Antipolis), **Karl Glasner** (University of Arizona), **Allen Tannenbaum** (Georgia Institute of Technology), **Richard Tsai** (University of Texas at Austin)

Scientific Overview

The purpose of this workshop is to bring together a diverse group of mathematicians and other scientists to discuss dynamical and numerical aspects of optimal transport. Optimal transport provides a natural geometry for characterizing and studying many evolutionary partial differential equations. In particular, their dynamics is seen to possess either a gradient flow or Hamiltonian structure when viewed on a manifold endowed with an optimal transport metric. These connections have found diverse applications, ranging from fluid mechanics to materials microstructure evolution and Ricci flow. Algorithms for numerical transport optimization have applications in a variety of areas such as image processing, medicine, computational cosmology, geosciences, or urban transport. Numerical transport optimization methods have not yet reached their full capacity where they can meet the most demanding practical applications.

Confirmed Speakers

Marc Bernot (École Normale Supérieure de Lyon), **Julie Delon** (École Nationale Supérieure de Télécommunications), **Selim Esedoglu** (University of Michigan) **Ibrahim Fatkulin** (University of Arizona), **Tryphon Georgio** (University of Minnestoa, Twin Cities), **Lorenzo Giacomelli** (Università di Roma "La Sapienza"), **Roland Glowinski** (University of Houston), **Maria Gonzalez** (Universitat Politécnica de Catalunya), **Maria Gualdani** (University of Texas at Austin), **Eldad Haber** (Emory University), **Chiu-Yen Kao** (Ohio State University), **Steve LaValle** (University of Illinois at Urbana-Champaign), **Igor Mezic** (University of California, Santa Barbara), **Sanjoy Mitter** (Massachusetts Institute of Technology), **Adam Oberman** (Simon Fraser University), **Olof Runborg** (Royal Institute of Technology (KTH)), Filippo Stanambrogio (École Normale Supérieure de Cachan), **Andrei Sobolevskii** (Observatoire de la Côte d'Azu), **Allen Tannenbaum** (Georgia Institute of Technology), **Richard Tsai** (University of Texas at Austin), **Axel Voigt** (Technishche Universtitat Dresden), **Marie-Therese Wolfram** (Johann Radon Institute for Computational and Applied Mathematics (RICAM), **Haomin Zhou** (Georgia Institute of Technology)

Long Program Schedule

- Tutorials, March 11-14, 2008
- Workshop 1: Aspects of Optimal Transport in Geometry and Calculus of Variations, March 31 – April 4, 2008
- **Workshop 2: Numerics and Dynamics for Optimal Transport, April 14 – 18, 2008**
- Workshop 3: Transport Systems in Geography, Geosciences, and Networks, May 5 – 9, 2008
- Workshop 4: Optimal Transport in the Human Body: Lungs and Blood, May 19 – 23, 2008
- Mini Workshop: Entropies and Optimal Transport in Quantum Mechanics, 2 days, June 5 – 6, 2008
- Culminating Workshop at Lake Arrowhead Conference Center, June 8 – 13, 2008

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.

www.ipam.ucla.edu/programs/otws2

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