



Optimal Transport in the Human Body: Lungs and Blood

• May 19 – 23, 2008

ORGANIZING COMMITTEE: **SUNCICA CANIC** (University of Houston), **DENIS GREBENKOV** (École Polytechnique), **BERTRAND MAURY** (Université d'Orsay), **ANNE MARIE ROBERTSON** (University of Pittsburgh)

Scientific Overview

The human body is a fascinating transport system, in which organs must exchange nutrients, water, oxygen, and waste to maintain life. To allow rapid access of a large amount of oxygen to the whole body, the respiratory and cardiovascular systems exhibit extremely complex geometrical structures. In the course of evolution, these organs have been optimized for efficient transfer under various and sometimes unknown constraints. For instance, the respiratory systems in mammals and birds are very different, although they are both highly efficient. A better understanding of the optimal transport in these systems is a key for curing diseases, drug delivery, and design of artificial implants. This interdisciplinary workshop will bring together internationally renowned experts, postdocs, and students with research interests in the respiratory and cardiovascular systems, as well as in optimal transport.

Confirmed Speakers

Roberto Camassa (University of North Carolina), **Suncica Canic** (University of Houston), **Ludovic De Rochefort** (Cornell University), **Mauro Ferrari** (University of Texas Health Science Center at Houston), **Marcel Filoche** (École Polytechnique), **Vincent Fleury** (Université de Rennes I), **Aaron Fogelson** (University of Utah), **Jean-Frédéric Gerbeau** (INRIA), **Celine Grandmont** (INRIA), **Denis Grebenkov** (École Polytechnique), **Giovanna Guidoboni** (University of Houston), **Genevieve Guillot** (Université d'Orsay), **Dr. Craig Hartley** (Baylor College of Medicine), **Jay Humphrey** (Texas A&M University), **Marina Kameneva** (University of Pittsburgh), **Bertrand Maury** (Université d'Orsay), **Tsong-Why Pan** (University of Houston), **Anne Marie Robertson** (University of Pittsburgh), **Dr. Doreen Rosenstrauch** (University of Texas Health Science Center at Houston), **Bernard Sapoval** (École Polytechnique), **Charles Taylor** (Stanford University), **Ewald Weibel** (Universität Bern), **M. Zamir** (University of Western Ontario)

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/otws4

