



Oberwolfach Seminar

Optimal Transport Theory and Hydrodynamics (from Euler to Monge and vice versa)

Organizers: Yann Brenier, Paris
Mikaela Iacobelli, Durham
Filippo Santambrogio, Orsay
Date (ID): 14 - 20 October 2018
Deadline: 15 August 2018

Optimal transport theory is a very successful field of mathematics connecting calculus of variations, probability theory, differential geometry, partial differential equations, functional analysis, statistics and computer sciences. Going back to Monge around 1780, this theory has deep connections with the earlier work of Euler on Hydrodynamics around 1750. This connection has recently known a strong revival on many different sides, leading to various non trivial generalizations of the concept of optimal transport. Three examples will be covered in the seminar:

(1) Continuous multimarginal optimal transport problems (Euler equations, models of congestion, sprays...) and their close relationship with the mean-field game theory introduced by Lasry and Lions about 10 years ago;

(2) Entropic regularization of the mass transport problem (started by Schrödinger in the late 30s) and its recent generalization to Hydrodynamics;

(3) Kinetic formulation of the Euler equations as a model of optimal incompressible transport.

During the week, tutorials on optimal transport, Euler equations and fluid dynamics will be held, starting from a crash course on the very first day.

The seminar takes place at the Mathematisches Forschungsinstitut Oberwolfach. The Institute covers board and lodging. By the support of the Carl Friedrich von Siemens Foundation travel expenses can be reimbursed up to 150 EUR in average per person (against copies of travel receipts). The number of participants is restricted to 25.

Applications including

- full name and address, incl. e-mail address
- short CV and publication list
- present position, university
- name of supervisor of Ph.D. thesis
- a short summary of previous work and interest
- title, ID and date of the intended seminar

should be sent preferably by e-mail (with attachments in pdf format) via seminars@mfo.de until 15 August 2018 to:

Prof. Dr. Dietmar Kröner
Mathematisches Forschungsinstitut Oberwolfach
Schwarzwaldstr. 9 – 11
77709 Oberwolfach
Germany

