Programme on

"Optimal Transport"

April 15 – June 14, 2019

organized by

Mathias Beiglböck (U Vienna), Alessio Figalli (ETH Zürich), Jan Maas (IST Austria), Robert McCann (U Toronto), Justin Solomon (MIT, Cambridge)

Monday, May 20, 2019

14:00 – 14:45 **Vitalii Konarovskyi (U of Leipzig)**

A particle model for Wasserstein type diffusion

Abstract: The discussion will be devoted to a family of interacting particles on the real line which have a connection with the geometry of Wasserstein space of probability measures. We will consider a physical improvement of a classical Arratia flow, but now particles can split up and they transfer a mass that influences their motion. The particle system can be also interpreted as an infinite dimensional version of sticky reflecting dynamics on a simplicial complex. The model appears as a martingale solution to an infinite dimensional SDE with discontinuous coefficients. In the talk, I am going to consider a reversible case, where the construction is based on a new family of measures on the set of real non-decreasing functions as reference measures for naturally associated Dirichlet forms. In this case, the intrinsic metric leads to a Varadhan formula for the short time asymptotics with the Wasserstein metric for the associated measure valued diffusion. The talk is based on joint work with Max von Renesse.

14:45 – 15:30 **Augusto Gerolin (VU Amsterdam)**

An Optimal Transport approach for the Schrdinger Bridge problem and convergence of Sinkhorn algorithm

Abstract: This talk exploit the equivalence between the Schrdinger Bridge problem and the entropy penalized optimal transport in order to find a different approach to the duality, in the spirit of optimal transport. This approach results in a priori estimates which are consistent in the limit when the regularization parameter epsilon goes to zero. Our method extends easily also when we have more that two marginals: as a byproduct we prove that the Sinkhorn algorithm is converging also in the multimarginal case.

16:00 – 16:45 **Edward Chien (MIT)**

Clustering with Ricci flow on graphs & Dynamical optimal transport on triangle meshes

Abstract: Two applied OT works will be discussed. The first is in preliminary stages and is investigating graph clustering with a Ricci flow formulation, following Ollivier's definition. Background and motivations for the curvature definition will be presented, as well as some preliminary experimental results in a Word Sense Induction application (a natural language processing task). The results suggest theoretical directions for exploration, and suggestions are welcome. Explorations joint with Nilai Sarda.

The second is "Dynamical Optimal Transport on Surfaces", a graphics work (joint with Hugo Lavenant, Sebastian

Claici, and Justin Solomon) that discretizes the Benamou-Brenier dynamic OT formulation on a triangle mesh. The discretization and its relation to Otto calculus will be presented, along with applications to gradient flows in the Wasserstein space over the surface.

All talks take place at ESI, Boltzmann Lecture Hall!