SCMS Seminar

REGULARITY OF OPTIMAL TRANSPORT MAPS

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Time: 3:00-4:00 pm., Wednesday, June 24, 2015

Venue: Room 2201, East Main Guanghua Tower, Handan Campus

Title: Regularity of optimal transport maps

Abstract: Given a source domain X associated with density f, a target domain Y associated with density g and a cost function c(x,y), the optimal transport problem is about finding a map among all measure preserving maps minimizing the transport cost $$\int_{X} c(x, T(x)) f(x)dx.$$ The theory of optimal transportation has many applications in pure and applied mathematics. When the cost function is the square of Euclidean distance, Caffarelli had developed a very beautiful regularity theory of optimal maps. For general costs, the first breakthrough was made by Ma, Trudinger and Wang in 2005, they introduced a fourth order condition on the cost (sometimes called MTW condition) and proved that the optimal maps are smooth assuming that the cost satisfies MTW and that the domains and densities satisfy some mild conditions. Interestingly, a few years later, Loeper showed that the MTW condition is actually necessary to guarantee that the optimal maps are always smooth for arbitrary smooth densities. In this talk, I will present some recent results on the regularity of optimal transport maps when the cost function does not satisfy the MTW condition. This is mainly based on a joint work with A. Figalli.

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