Special Lecture Series

Speaker: **Yann Brenier**  
CNRS, Ecole Polytechnique, Palaiseau France

**Title:** the Monge-Ampère equation in mathematical modelling

**Abstract:** The (real) Monge-Ampère equation is a fully nonlinear elliptic equation of very geometric nature since it can be used to recover a convex hypersurface from the only knowledge of its Gaussian curvature (which corresponds to the Minkowski problem). This equation plays a central role in the theory of optimal transportation, initiated by Monge (1780) and Kantorovich (1942), which is connected to many different fields of pure and applied mathematics.

**Lecture 1:** A direct application of the Monge-Ampère equation in Cosmology  
**Abstract:** I will be considering a direct application of the Monge-Ampère equation to the reconstruction of the early universe, following Zeldovich, Peebles and Frisch.  
**Time:** Monday 12 Jan, 2015 at 15:30  
**Place:** Auditorium 233, Amado Mathematics Building, Technion

**Lecture 2:** The semi-geostrophic model of atmosphere and ocean dynamics.  
**Abstract:** I will discuss the semi-geostrophic model of atmosphere and ocean dynamics, following Eliassen, Hoskins, Cullen and Purser.  
**Time:** Tuesday 13 Jan, 2015 at 15:30  
**Place:** Auditorium 233, Amado Mathematics Building, Technion

**Lecture 3:** Maps of minimal distortion and magnetohydrodynamics  
**Abstract:** I will talk about maps of minimal distortion with prescribed volume elements, a concept which connects computational geometry and magnetohydrodynamics  
**Time:** Thursday 15 Jan, 2015 at 15:30  
**Place:** Auditorium 233, Amado Mathematics Building, Technion