İSTANBUL ANALYSIS SEMINARS

Plurisubharmonic envelopes and supersolutions.

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Abstract: Envelopes are classical objects in convex Analysis, Potential Theory and arize as solutions to obstacle problems and free boundary problem to some PDE's. They were successfully used by E. Bedford and B.A Taylor in the late 1970s to solve the Dirichlet problem for complex Monge-Ampre equations, leading to the construction of what is now called "pluripotential theory." We will introduce (quasi-)plurisubharmonic envelopes on compact Kähler manifolds, as well as on domains of $\mathbb{C}^n$, by using and extending an approximation process due to Robert Berman. We will show that the quasi-psh envelope of a viscosity super-solution is a pluripotential super-solution of certain complex Monge-Ampre equations. Then we will use these ideas to solve degenerate complex Monge-Ampre equations by taking lower envelopes of super-solutions. This is a joint work with Chinn H. Lu and Vincent Guedj. To appear in Journal of Differential Geometry (see arXiv:1703.05254).

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