# COMPLEX ANALYSIS SEMINAR

## JOINT WITH SHOEMAKER LECTURES SERIES

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## BASIC EXISTENCE AND REGULARITY RESULTS OF MONGE-AMPERE EQUATIONS

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**ABSTRACT**: Monge-Ampère equations are second order partial differential equations whose leading term is the determinant of the Hessian of the unknown function. They are arguably the most natural fully non-linear equations, and occur frequently in geometry and applied science. They can be real or complex, depending on whether the variable is real or complex, in which case the unknown is required respectively to be convex or plurisubharmonic. The theory of Monge-Ampère equations has a long and distinguished history, with contributions from many of the leading geometers and analysts of our time. This lecture series is devoted to a survey of some aspects of this theory. In particular, we shall discuss examples of such equations and their applications to geometry; variational principles; notions of generalized solutions for both the real and the complex case; and a priori estimates. We shall also take the opportunity to discuss some major problems in Kähler geometry and partial differential equations which are currently attracting a lot of interest.

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**Date:** Thursday, November 15, 2012

**Time:** 4pm-5pm

**Place:** ST 131 (SPECIAL PLACE)