Massachusetts Institute of Technology
Department of Mathematics

LUNCH SEMINAR FOR GRADUATE STUDENTS

MONDAY, OCTOBER 1, 2012

11:30 - 12:30 PM   ROOM 4-159

!!! Please note change in time and location !!!

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"Moduli spaces of pseudoholomorphic curves"

Abstract

A major tool in symplectic topology is the study of moduli spaces of pseudo-holomorphic curves, which has a surprising variety of applications from a non-squeezing theorem via Gromov–Witten invariants and Floer theory to a symplectic 2-category. This talk, however, will focus on the foundations of this study which take the place of algebraic techniques in the study of moduli spaces of holomorphic curves in complex varieties. Moduli spaces of pseudo-holomorphic curves are instead described as solution spaces of nonlinear elliptic PDEs modulo the - often problematic — action of a reparametrization group. This analytic point of view allows — via a degeneration of PDEs — to see direct connections to gauge theory and thus low dimensional topology. The symplectic applications moreover require a regularization of given moduli spaces — eg. as compact manifolds unique up to cobordism. In limited situations, this can be achieved by geometric means, but in general it raises highly nontrivial analytic and topological problems involving atrocities such as the need to quotient by a nondifferentiable group action, or to preserve compactness under perturbation in a not first countable topological space. I will explain current solution philosophies for some of these challenges.

Followed by pizza in room 2-290