

# MATHEMATICS COLLOQUIUM

**Tuesday, February 7**

**Speaker: Mohammed Abouzaid (MIT)**

**4:00 p.m. Rm. 151 Sloan**

**Title: Lagrangian Floer theory, with toric manifolds as an example**

Abstract: One of the central problems in symplectic topology is understanding Lagrangian embeddings: the main tool for studying this problem is Floer theory. In order to have concrete examples in mind, I will begin by defining the notion of a toric symplectic manifold, and describe how the symplectic structure on such manifolds is encoded by a projection (the moment map) to a polytope.

I will then describe joint work with Fukaya, Oh, Ohta, and Ono about generation results for Fukaya

categories, i.e. a criterion for a collection of Lagrangians in a given symplectic manifold to determine the Floer theory of all other Lagrangians, up to purely algebraic operations. Applied to toric manifolds, this implies that there is a finite collection of moment fibres which determines the Fukaya category, as well as quantum cohomology. I will end the talk by explaining how this approach yields an essentially tautological proof of Kontsevich's Homological mirror symmetry conjecture for these spaces.