New York Area Symplectic Seminar

at Columbia University

Friday, October 24, 2008
Math Bldg, Rm 520

1:00pm Aleksey Zinger (Stony Brook)
From Gromov-Witten invariants to integer counts

Abstract: Gromov-Witten invariants of a compact symplectic manifold are certain virtual counts of J-holomorphic curves. These rational numbers are rarely integer, but are generally believed to be related to some integer counts. In string theory, these counts are known as instaton numbers and BPS states. The predictions of Aspinwall-Morrison and Gopakumar-Vafa for the existence of BPS states of Calabi-Yau 3-folds are extended by Pandharipande to all 3-folds, by Klemm-Pandharipande to all Calabi-Yau varieties in genus 0 and Calabi-Yau 4-folds in genus 1, and by Pandharipande and the speaker to Calabi-Yau 5-folds in genus 1. The last extension came as a bit of a surprise to some string theorists, who also feel that extensions to higher dimensions are impossible. The aim of this talk is to survey the known predictions, indicating how they arise, how the 6-dimensional case differs from low-dimensional cases, and why they hold for Fano classes in 3-folds (symplectic manifolds of real dimension 6).

3:30pm Mohammed Abouzaid (Clay/MIT)
A restriction functor in Lagrangian Floer Homology

Abstract: Consider an exact Lagrangian submanifold of an exact symplectic manifold (say an affine variety). Using a model for the (wrapped) Fukaya category of a cotangent bundle as modules over chains on the based loop space, I will define a restriction functor from the Fukaya category of the ambient symplectic manifold to the (wrapped) Fukaya category of the cotangent bundle. Time permitting, I will outline a conjectural version for plumbings.