New York Area Symplectic Seminar

at Columbia University

Friday, November 21, 2008
Math Bldg, Rm 520

1:00pm Cagatay Kutluhan (U. Michigan)
Seiberg-Witten Floer homology and symplectic forms on $S^1 \times M^3$

Abstract: Let M be a closed, connected, orientable 3-manifold. Subject to a monotonicity condition, we calculate the Seiberg-Witten Floer homology of M given that $S^1 \times M$ admits a symplectic form. In particular, we show that M fibers over the circle if it has first Betti number 1 and $S^1 \times M$ admits a symplectic form with non-torsion canonical class. This is joint work with Cliff Taubes.

3:30pm Michael Hutchings (Berkeley)
The Weinstein conjecture for stable Hamiltonian structures

Abstract: We use the equivalence between embedded contact homology and Seiberg-Witten Floer homology to obtain the following improvements on the Weinstein conjecture. Let Y be a closed oriented connected 3-manifold with a stable Hamiltonian structure, and let R denote the associated Reeb vector field on Y. We prove that if Y is not a T^2-bundle over S^1, then R has a closed orbit. Along the way we prove that if Y is a closed oriented connected 3-manifold with a contact form such that all Reeb orbits are nondegenerate and elliptic, then Y is a lens space. Related arguments show that if Y is a closed oriented 3-manifold with a contact form such that all Reeb orbits are nondegenerate, and if Y is not a lens space, then there exist at least three distinct embedded Reeb orbits. Joint work with Cliff Taubes.