

Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, Nov 3rd, 2014

ROOM 383N, STANFORD

2:30–3:30, room 383N

Mark McLean (Stony Brook University)

Minimal Log Discrepancy of Isolated Singularities and Reeb Orbits

Abstract: Let A be an affine variety inside a complex N dimensional vector space which either has an isolated singularity at the origin or is smooth at the origin. The intersection of A with a very small sphere turns out to be a contact manifold called the link of A . Any contact manifold contactomorphic to the link of A is said to be Milnor fillable by A . If the first Chern class of our link is 0 then we can assign an invariant of our singularity called the minimal discrepancy. We relate the minimal discrepancy with indices of certain Reeb orbits on our link. As a result we show that the standard contact 5 dimensional sphere has a unique Milnor filling up to normalization. This generalizes a Theorem by Mumford.

3:30–4:00 — Tea Break, 2nd floor lounge

4:00–5:00, room 383N

Simon Donaldson (Simons Center for Geometry and Physics)

Symplectic forms on 4-manifolds and elliptic equations

Abstract: This talk will be based on the relatively old paper math/0607083. We describe a family of nonlinear elliptic partial differential equations for symplectic forms on 4-manifolds. The prototype is the complex Monge-Ampere equation on a Kahler surface, in which case the existence of solutions was proved by Yau in the 1970's. We will review something of what is known about extensions to the almost-complex case (work of Tosatti, Weinkove, Yau, Salamon, Fino and others) and the "tamed versus compatible" problem. In one direction, results from symplectic topology have implications about the development of singularities of solutions. In the other direction, optimistically, if one had a good understanding of the singularities one might be able to draw consequences about symplectic structures on 4-manifolds.

There will be dinner at 6:00pm

—D. Auroux, Y. Eliashberg, D. Fuchs, V. Ginzburg, M. Hutchings, E. Ionel, R. Montgomery, K. Wehrheim, A. Weinstein