

Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, May 5, 2008

BERKELEY, 321 Haviland Hall
(SW of the North Gate at Euclid and Hearst)

2:30–3:30

Andrew Cotton-Clay (UC Berkeley)

Symplectic Floer homology of pseudo-Anosov and reducible maps

The symplectic Floer homology of a symplectomorphism ϕ , $HF_*(\phi)$, encodes data about the fixed points of ϕ using counts of holomorphic cylinders in $M_\phi \times \mathbb{R}$, where M_ϕ is the mapping torus of ϕ . We show how to calculate $HF_*(\phi)$ using train tracks for ϕ a surface symplectomorphism in a pseudo-Anosov or reducible mapping class, completing the computation of Seidel's $HF_*(g)$ for g any (oriented) mapping class. By recent work of Taubes, this should calculate the Seiberg-Witten Floer homology of M_ϕ in certain spin^c structures. Our results also include surfaces with boundary, and as an application, we give a sharp lower bound on the number of fixed points of an area-preserving map (with nondegenerate fixed points) in any prescribed mapping class (rel boundary), generalizing the Poincaré-Birkhoff fixed point theorem.

3:30-4:00

Tea break

4:15–5:15

Tom Parker (Michigan State University)

An obstruction bundle relating Gromov-Witten invariants of curves and Kähler surfaces In previous work with Junho Lee, we defined symplectic “Local Gromov-Witten invariants” associated to spin curves and showed that the GW invariants of Kähler surfaces with $p_g > 0$ are sums of such local invariants. This talk describes how these Local GW invariants arise from an obstruction bundle (in the sense of Taubes) over the space of stable maps into curves, thereby relating two- and four-dimensional GW theory. I will explain how we overcome analytic difficulties that arise because the space of maps is not a manifold, and I will explain why the Euler class of the obstruction bundle cannot be computed by the techniques often used by algebraic geometers in similar situations.

Please contact alanw@math.berkeley.edu to arrange parking.

There will be a dinner at 6pm

—Y. Eliashberg

D. Fuchs

V. Ginzburg

E. Ionel

R. Montgomery

A. Weinstein