

# Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, February 3, 2014

EVANS HALL, BERKELEY

2:30–3:30 (Room 891)

Pedro Rios (University of São Paulo, visiting Berkeley)

Wigner caustics of Lagrangian submanifolds

**Abstract** If  $L$  is a Lagrangian submanifold of a  $2n$ -dimensional affine symplectic space, the Wigner caustic of  $L$  is the set of midpoints of chords connecting pairs of “weakly parallel” points in  $L$ , that is, pairs of points whose tangent spaces are not transversal. In this talk, we will present the physical origins of Wigner caustics and then study their singularities, both on-shell (i.e. close to  $L$ ) and off-shell. If time allows, we may say a few words on how off-shell Wigner caustics can be seen as part of a larger affine-invariant “global centre symmetry set” of  $L$ , as well as on the relation between singularities of Wigner caustics of Lagrangian submanifolds and singularities of a class of solutions of the classical Monge-Ampere equation in  $2n$  variables.

3:30–4:00 (Room 1015)

Tea Break

4:15–5:15 (Room 740)

Matthew Strom Borman (Stanford)

Contact rigidity and quasi-morphisms on contactomorphism groups

**Abstract:** In this talk, I will show how certain quasi-morphisms on the universal cover of a contactomorphism group lead to a hierarchy of rigid subsets of the contact manifold, analogous to Entov-Polterovich’s work in the symplectic setting. For certain prequantizations of monotone symplectic toric manifolds, such quasi-morphisms can be constructed using Givental’s nonlinear Maslov index and a contact reduction technique. These quasi-morphisms also have applications to orderability for contact manifolds and Sandon-type metrics on contactomorphism groups. This is joint work with Frol Zapolsky.

Please contact [alanw@math.berkeley.edu](mailto:alanw@math.berkeley.edu) to arrange parking.

There will be a dinner at 6:00

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