

# Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, December 4, 2023  
at Berkeley

2:30–3:30, room 736 Evans

Rohil Prasad (UC Berkeley)

## On the dense existence of compact invariant sets

**Abstract:** This is joint work in progress with Dan Cristofaro-Gardiner. We explore the topological dynamics of Reeb flows beyond periodic orbits and find the following rather general phenomenon. For any Reeb flow for a torsion contact structure on a closed 3-manifold, any point is arbitrarily close to a proper compact invariant subset of the flow. Such a statement is false if the invariant subset is required to be a periodic orbit. Stronger results can also be proved that parallel theorems of Le Calvez-Yoccoz, Franks, and Salazar for homeomorphisms of the 2-sphere. In fact, we can also extend their results to Hamiltonian diffeomorphisms of closed surfaces of any genus.

3:30–4:00 — Tea Break

4:00–5:00, room 736 Evans

Mohan Swaminathan (Stanford)

## Constructing smoothings of stable maps

**Abstract:** The moduli space of closed holomorphic curves in a closed symplectic manifold can be compactified using stable maps. However, even in the nicest of situations (e.g., degree  $d$  curves of genus  $g$  in a complex projective space, with  $d \gg g$ ), counting dimensions shows that most stable maps which have ghost components are not “smoothable”, i.e., they can never appear as the limit of a sequence of non-singular holomorphic curves. It is therefore natural to ask which stable maps are smoothable (with the aim of obtaining a compact moduli space which is smaller than the full space of stable maps). In this talk, I will describe recent work (joint with Fatemeh Rezaee) which provides a partial answer to this question, in all genera, when the target is a smooth projective variety. We do this via a gluing construction, with the key new input being a class of explicit model solutions which dictate how to smooth a stable map near its ghost components.

There will be dinner in downtown Berkeley following the talks.

**Organizers:** M. Abouzaid, R. Casals, Y. Eliashberg, D. Fuchs, V. Ginzburg, M. Hutchings, E. Ionel, R. Montgomery, V. Shende, L. Starkston, K. Wehrheim, A. Weinstein