

# Northern California Symplectic Geometry Seminar

BERKELEY – DAVIS – SANTA CRUZ – STANFORD

Monday, April 7th, 2025

at Stanford

2:30–3:30pm, room 384H

Basak Gurel (University of Central Florida)

## Invariant Sets and Hyperbolic Periodic Orbits

**Abstract:** The presence of hyperbolic periodic orbits or invariant sets often has an effect on the global behavior of a symplectic dynamical system. In this talk we discuss two theorems along the lines of this phenomenon, extending some properties of Hamiltonian diffeomorphisms to dynamically convex Reeb flows on the sphere in all dimensions. The first one, complementing other multiplicity results for Reeb flows, is that the existence of a hyperbolic periodic orbit forces the flow to have infinitely many periodic orbits. This result can be thought of as a step towards a higher-dimensional Franks' theorem or forced existence of periodic orbits for Reeb flows. The second result is a contact analogue of the higher-dimensional Le Calvez-Yoccoz theorem proved by the speaker and Ginzburg and asserting that no periodic orbit of a Hamiltonian pseudo-rotation of a complex projective space is locally maximal. The talk is based on a joint work with Erman Cineli, Viktor Ginzburg and Marco Mazzucchelli.

3:30–4:00pm — Tea Break

4:00–5:00pm, room 383N

Jae Hee Lee (Stanford)

## 3D mirror symmetry in positive characteristic

**Abstract:** In positive characteristic, on one hand the quantum D-module (from Gromov–Witten theory) carries extra central endomorphisms known as quantum Steenrod operations. On the other hand, in representation theory, the algebra of differential operators also carry a "large center" in positive characteristic given by a version of the Frobenius map. I will explain how these centers are related to each other by a duality of algebraic symplectic varieties. Joint with Shaoyun Bai.