

Shunyu Wan

Title: Negative contact surgery on Legendrian non-simple knot

Abstract: Etnyre first asked the question on when contact surgery on distinct Legendrian knots produces distinct contact manifolds, and he showed that $+1$ contact surgeries on certain non Legendrian isotopic representatives of the twist knots always produce the same contact 3-manifold. However, later using linearized contact homology Bourgeois-Ekholm-Eliashberg showed that -1 contact surgery (Legendrian surgery) on those representatives of the twist knots will produce different contact 3-manifolds. Using the contact invariant and Legendrian LOSS invariant in Heegaard Floer theory we are able to show that any contact negative rational surgery (except -1) on the Legendrian representatives of twist knots that have different LOSS invariants produces different contact manifolds with different contact invariants. I will first talk about the background on contact geometry and the statement of the problem/theorem, then I will talk about the proofs and how Heegaard Floer came into play. This is joint work with Hugo Zhou.