Title:

On the equivariant Casson invariant for fibered knots. Speaker:

Yukihiro Tsutsumi (Sophia University, JSPS Research Fellow) Abstract:

Let K be a fibered knot in S^3 with $\operatorname{vol}(S^3 - K) = 0$. Then K is a fibered knot such that the monodromy is decomposed into periodic maps and the JSJ-family of the complement consists of Seifert fibered spaces. A theorem of O. Collin and N. Saveliev implies that for such a fibered knot K, the Casson invariant $\lambda(\Sigma_K^r)$ of the r-fold cyclic cover Σ_K^r of S^3 with branch set K is written in terms of the equivariant knot-signatures of K which are determined by the matrix of the monodromy (when Σ_K^r is an integral homology sphere.) This is specific to fibered knots with $\operatorname{vol}(S^3 - K) = 0$ and is due to some property of the SU(2)-representation of $\pi_1(\Sigma_K^r)$ under the cyclic action on Σ_K^r .

Given a fibered knot with certain properties, one can construct infinitely many fibered knots with the same Seifert form and with distinct values of $\lambda(\Sigma_K^r)$ by adding a Dehn twist to the monodromy. We study the variation of $\lambda(\Sigma_K^r)$ under this construction and $\operatorname{vol}(S^3 - K)$ for fibered knots and non-fibered knots with trivial Alexander polynomial.