

Colloquium

University of Notre Dame
Department of Mathematics

Speaker: Juanita Pinzón-Caicedo

NC State University

Will give a lecture entitled

Four-manifolds and knot concordance

Date: Tuesday, December 11, 2018

Time: 4:00 PM

Location: 129 Hayes-Healy Hall

Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.



Abstract:

The main goal of geometric topology is the classification of manifolds within a certain framework (topological, piecewise linear, smooth, simply-connected, symplectic, etc.). Dimension four is special, as it is the only dimension in which a manifold can admit infinitely many non-equivalent smooth structures, and the only dimension in which there exist manifolds homeomorphic but not diffeomorphic to \mathbb{R}^4 . In turn, knot concordance is the study of knots as boundaries of surfaces embedded in spaces of dimension 4. Questions pertaining to 4-manifolds, like the difference between topological and smooth structures, can be addressed in terms of knot concordance. A powerful tool for studying the algebraic structure of the knot concordance group comes from satellite operations. In the talk I will describe how to use $SO(3)$ gauge theory to provide a general criterion sufficient for the image of a satellite operation to generate an infinite rank subgroup of the smooth concordance group.