Colloquium

University of Notre Dame
Department of Mathematics

Speaker: Alexandra Kjuchukova

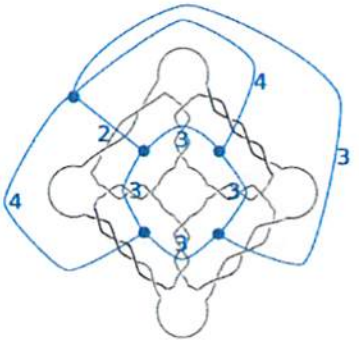
Max Planck Institute for Mathematics - Bonn

Will give a lecture entitled
Knot colorings and quotients of knot groups

Date: Wednesday, January 15, 2020
Time: 4:00 PM
Location: 229 Hayes-Healy Hall
Departmental Tea: Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.m.

Abstract:

A knot K is an embedded circle in S^3, and the properties of K are captured by its complement, $S^3 \backslash K$. We study the fundamental group of the knot complement, $\pi_1(S^3 \backslash K)$, through its quotients. Strikingly, quotients of knot groups, while algebraically defined, reveal deep geometric properties. For instance, I'll discuss joint work with Baader and Blair where we use Coxeter quotients of knot groups to compute the bridge numbers of knots. This settles the Meridional Rank Conjecture (Kirby List problem 1.11) for new infinite families of knots. Furthermore, quotients of $\pi_1(S^3 \backslash K)$ induce irregular branched covers of K, which provide powerful ways of distinguishing knots as well as representing 3– and 4– manifolds. I will outline some advances in this area, including a new invariant that could potentially detect a counter-example to Fox's slice-ribbon conjecture. Parts of this work are joint with Cahn, Geske, Orr and Shaneson.



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