

Geometry, Groups and Dynamics/GEAR Seminar
(held at the Illinois hub of GEAR)

12:00 pm, 243 Altgeld Hall, Tuesday, October 2, 2018

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Generalized square knots and the 4-dimensional Poincare Conjecture

Abstract: The smooth version of the 4-dimensional Poincare Conjecture (S4PC) states that every homotopy 4-sphere is diffeomorphic to the standard 4-sphere. One way to attack the S4PC is to examine a restricted class of 4-manifolds. For example, Gabai's proof of Property R implies that every homotopy 4-sphere built with one 2-handle and one 3-handle is standard. In this talk, we consider homotopy 4-spheres X built with two 2-handles and two 3-handles, which are uniquely determined by the attaching link L for the 2-handles in the 3-sphere. We prove that if one of the components of L is the connected sum of a torus knot $T(p,2)$ and its mirror (a generalized square knot), then X is diffeomorphic to the standard 4-sphere. This is joint work with Jeffrey Meier.