

# MSRI–Evans Talk

Monday, 4:10–5:00pm, 60 Evans

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Feb. 22    **Tomasz Mrowka**, Massachusetts Institute of Technology  
*How to detect unknottedness using instantons and Khovanov homology*

There are now many, many invariants of knots and links coming from many sources, algebraic topology, representation theory, statistical mechanics, gauge theory and symplectic geometry. A basic question about these invariants is whether they can detect the unknot. Some classical invariants, like the Alexander polynomial cannot, while others like the knot group can. More modern invariants like the various Floer homology theory based on Instantons, Seiberg-Witten monopoles or Ozsvath and Szabo's Heegaard Floer homology all can detect the unknot. The status of the Jones polynomial remains undetermined. I will try to explain why some of these theories are able to detect the unknot and mention some recent work of Kronheimer and myself that leads to a proof that Khovanov homology detects the unknot by relating Khovanov homology to a version of Instanton Floer homology.