A First Look at Knots and Symmetries

Kristen Hendricks

Rutgers University

Abstract: A mathematical knot is a simple object -- take a piece of string, tie it up however you like, and glue the ends together so you can't untie it. But these deceptively easy objects to describe and fiddle with are key to understanding deep geometric questions, many not nearly so accessible. We'll introduce knots and consider some possible measures of how complicated a knot is, before turning our attention to one of my favorite topics, possible symmetries of knots. In the end, we'll see how different types of symmetry have wildly different relationships with how "complicated" the knots involved are.

Kristen Hendricks is a low-dimensional and symplectic topologist. Most of her work is focused on developing equivariant versions of various Floer-theoretic invariants and exploring their applications to problems of 3-manifolds and knots. She did her undergraduate degree in mathematics at Harvard, followed by doctoral work at Columbia and a postdoctoral position at UCLA. After three years as an assistant professor at Michigan State, she moved to Rutgers, where she is presently an associate professor. Her work has been recognized by an NSF CAREER grant (2018), a Sloan Research Fellowship (2019), and an AWM Birman Research Prize in Topology and Geometry (2023). When not doing mathematics, she enjoys science fiction novels and unnecessarily complicated knitting projects.