School of Mathematics and Physics Women in Mathematics Day

Knots, Graphs and Lattices by Associate Professor Zsuzsi Dancso

Abstract:

In this talk I'll tell the story of a recent breakthrough in knot theory - by Greene, 2011 - using the "Tait graph" construction and an invariant of graphs to completely distinguish between alternating knots up to "knot mutation". I will describe my and my collaborators' new results generalising this construction to knots on surfaces (virtual knots), and showing - by counterexample - that the analogous invariant is not complete up to mutation. That is, it's unable to tell some mutation classes apart.

I will end with a brief description of the computational methods used, and a list of questions which arose from these techniques and results.

This talk does not assume specialist knowledge of topology or graph theory, and will be accessible to an audience with some general background in undergraduate mathematics.

This talk is based on joint work with Hans Boden, Damian Lin and Tilda Wilkinson-Finch.