

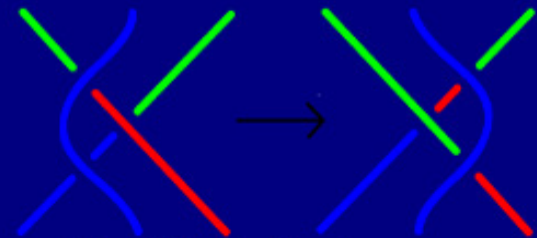
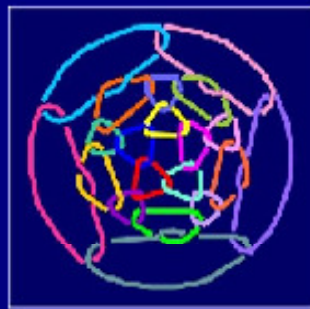
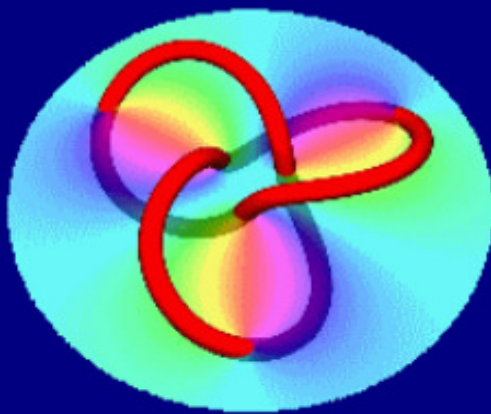
Math 560: Selections from Geometry and Topology

Knot Theory

Fall 2011 TR 1:30pm - 3:00pm DRL

One can think of a knot as a piece of elastic string floating around with its endpoints joined together (stretching and bending are allowed but cutting is not). It is surprisingly hard to decide, given two knots, if they are the same or not and lots of good mathematics is needed to help answer this question.

We will learn about various properties of knots and knot invariants including Reidemeister theorem, knot polynomials (Jones, Kauffman, Alexander), colorings, and the fundamental group of knot complement. The last part of the course shall depend on student interest- we will discuss more advanced topics like the relationship to 3-manifold topology, recent developments and applications in other sciences: molecular and DNA biology (protein folding, supercoiling), physics etc.



Books:

- C. Adams, The Knot Book
- P. Cromwell Knots and Links
- A. Sossinsky, Knots
- C. Livingston, Knot Theory
- D. Rolfsen, Knots and Links
- W. B. R. Lickorish, An Introduction to Knot Theory

Websites:

- Knot Atlas katlas.org/wiki/Main_Page
- Knot Info www.indiana.edu/~knotinfo/
- KnotPlot www.knotplot.com/