

András Stipsicz: Invariants of knots: polynomials and homologies

In the lecture series we plan to introduce some of the most successful invariants of knots and links. We will give a combinatorial way of defining the classical Alexander polynomial, and describe the definition of the Jones polynomial. We also discuss the main properties of these invariants, and give some results using these tools in solutions of classical problems. Then, after recalling some basic definitions and constructions from homological algebra, we will define the simplest version of Khovanov homology, and work with this notion.

Prerequisites: An introductory working knowledge of homological algebra (chain complexes, chain homotopies, long exact sequences) would be helpful, but we plan to quickly review all these concepts in the course.