

UCL Undergraduate Mathematics Colloquium

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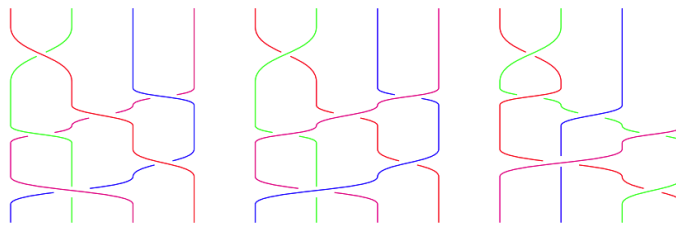
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The Burau Representation of the Braid Group

30th October 2024

Abstract: The braid group, first noticed by Gauss and later studied by Artin in the beginning of the 20th century, is a uniquely powerful and beautiful mathematical object. One of the most appealing things about braids is their multifaceted nature; as we will see, we can interpret the basic idea of interweaving strands in a variety of different ways, linking together ideas from geometry, algebra, and topology. Understanding how braid groups can be considered in these different contexts gives us solid footing to consider a representation of this group. We will discuss what exactly representations are, and how the Burau representation lets us simplify difficult algebraic expressions. We will also briefly link braids to the study of knots and links, and consider a few applications of braids outside of pure mathematics (namely mathematical physics and cryptography).

No prior knowledge outside of basic group theory is strictly required since everything will be explained from scratch, but familiarity with isotopies, fundamental groups and representations is helpful.



Speaker: **David Skigin**

Location: Malet Place Engineering Building 1.03

Time: **4pm - 5pm**

