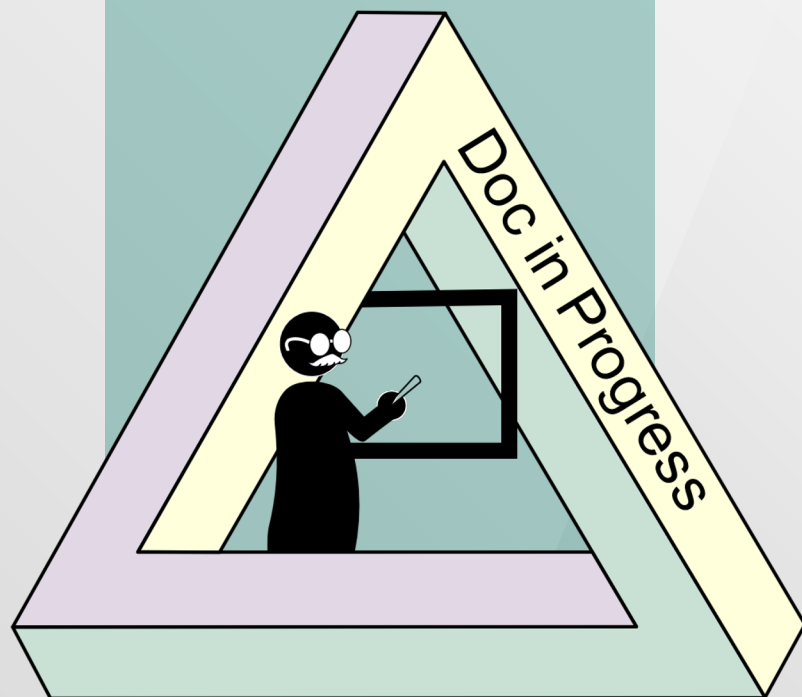




UNIVERSITÀ  
DI TRENTO

Dipartimento di  
Matematica



PhD in Mathematics

“Doc in Progress” is pleased to introduce you to

**Lorenzo Vecchi**

University of Bologna

PhD in Mathematics

## Geometry and combinatorics behind KL polynomials of matroids

Since their first introduction in 1935, matroids have always been considered a great combinatorial tool for branches of applied mathematics like Coding Theory and Optimization. However, in the last years, a deep interplay between Matroid Theory, Algebraic Topology and Algebraic Geometry has been found: the Combinatorics of matroids allows us to fully describe the cohomology of some interesting varieties; their Geometry led the way to solve long-standing combinatorial conjectures like the Heron-Rota-Welsh and the Top-Heavy conjectures.

In this talk, we will present Kazhdan-Lusztig polynomials for matroids, outlining the geometric setting in which they were first introduced in 2016. Many of their properties are still only conjectured, since their definition is given through an intricate recursion. We will show how one can partially solve these conjectures for wide classes of matroids using just combinatorial tools.

This is a joint work with L. Ferroni and G.D. Nasr.



Wednesday, May 11 – at 14:30 CET

The seminar will be held both in presence in Seminar Room “-1” (Department of Mathematics) and online via Zoom.

To join the event, please contact [docinprogress.unitn@gmail.com](mailto:docinprogress.unitn@gmail.com) using an institutional e-mail address for both reserving a sit in the seminar room or obtaining login credentials.