



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Mathematics Colloquium

Thursday, September 12, 2024
3:30–4:30 p.m.
Phillips Hall 332

Torelli groups and the geometry and arithmetic of moduli spaces of curves

Richard Hain (Duke)

Abstract.

The Torelli group of a compact orientable surface is the group of isotopy classes of automorphisms of the surface that act trivially on its homology. These mysterious groups exert considerable influence in the study of geometric and arithmetic properties of algebraic curves. They are not well understood, even in low genus. But what we do know, much of it due to Dennis Johnson in the 1980s, can be used to establish profound properties of curves. In this talk I will present 3 recent and seemingly unrelated results about algebraic curves and, in whose proofs, Torelli groups play a central role.