

Randal-Williams, Oscar: Cohomology of Torelli groups

It is a basic problem in the cohomology of moduli spaces of Riemann surfaces to describe the cohomology of the Torelli group---the subgroup of the mapping class group of those diffeomorphisms which act trivially on the first cohomology of the surface---as a representation of $\mathrm{Sp}(2g, \mathbb{Z})$, at least in a stable range depending on the genus of the surface. This question can be generalised to higher dimensions by replacing the genus g surface with its analogue $\#^g S^n \times S^n$. I will present joint work with Alexander Kupers in which we answer this question in dimensions at least 6. Our description is also valid in the classical case $2n=2$ assuming a finiteness conjecture about the cohomology of this Torelli group.