

The homology of big mapping class groups

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Abstract.

Mapping class groups of infinite-type surfaces (“big mapping class groups”) have recently become the subject of intensive study. However, their homology above degree one has only very recently begun to be understood.

I will describe joint work with Xiaolei Wu, in which we prove that there is an uncountable family of infinite type surfaces S such that $H_*(\mathrm{MCG}(S); \mathbb{Z}) = 0$ in all positive degrees, and another uncountable family of infinite type surfaces S such that $H_*(\mathrm{MCG}(S); \mathbb{Z})$ is uncountable in each positive degree. An example of the first family of surfaces is the disc minus a Cantor set and an example of the second is the plane minus a countably infinite discrete subset.

If time permits, I will also discuss an ongoing joint project with Xiaolei Wu where we study the question of whether $H_*(\mathrm{MCG}(S); \mathbb{Z})$ contains non-trivial elements having support on a compact subsurface of S . This question turns out to be especially subtle to answer when S has genus 0.

Partially based on [arxiv:2211.07470](https://arxiv.org/abs/2211.07470) and [arxiv:2212.11942](https://arxiv.org/abs/2212.11942).