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Algebraic and topological properties of big mapping class groups

The mapping class group of a surface is the group of homeomorphisms of the surface up to isotopy (a natural equivalence). Mapping class groups of finite type surfaces have been extensively studied and are, for the most part, well-understood. There has been a recent surge in studying surfaces of infinite type and in this talk, we shift our focus to their mapping class groups, often called big mapping class groups. The groups arise naturally when studying group actions on surfaces (dynamics) and foliations of 3-manifolds. In contrast to the finite type case, there are many open questions regarding the basic algebraic and topological properties of big mapping class groups. Until now, for instance, it was unknown whether or not these groups are residually finite. We will discuss the answer to this and several other open questions after providing the necessary background on surfaces of infinite type. This work is joint with Nicholas G. Vlamis.