Geometry of subgroups of mapping class groups

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Any finitely generated group G can be equipped with a *word metric* (unique up to bi-Lipschitz equivalence) turning it into a metric space. At the core of geometric group theory lies the idea of connecting geometric properties of this metric to algebraic properties of the group.

If $H < G$ is a finitely generated subgroup, then H has two natural metrics: its intrinsic word metric, and the restriction of the word metric of G. If G is a group whose geometry we understand, one might try to compare these metrics as a first step to understand the geometry of H. However, in general, these metrics can differ wildly, and Gromov defined the *distortion function* as a quantitative measure of how different they are.

In this talk we will give an overview about known results and open questions concerning distortion (and some intrinsic geometric results) in the case where G is the mapping class group of a surface, and H is a topologically motivated subgroup. Typical examples for H include stabilisers of curves, the Torelli subgroup (formed by those mapping classes acting trivially on the first homology of the surface), or the handlebody group (formed by those mapping classes extending from the surface to a three-dimensional handlebody).