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Title:

Moduli spaces of 3-manifolds with boundary are finite

Abstract:

In joint work with Rachael Boyd and Corey Bregman we study the classifying space $B \text{Diff}(M)$ of the diffeomorphism group of a connected, compact, orientable 3-manifold M . By a theorem of Milnor every such M has a unique prime decomposition as a connected sum of prime 3-manifolds.

The purpose of this talk is to explain how one can compute the moduli space $B \text{Diff}(M)$ in terms of the moduli spaces of prime factors. We show that certain space of systems of reducing spheres is contractible. (This can be thought of as saying that the modular infinity-operad of 3-manifolds is freely generated by irreducible manifolds.) We use this to prove that if M has non-empty boundary, then $B \text{Diff}(M \text{ rel boundary})$ has the homotopy type of a finite CW complex, as was conjectured by Kontsevich.