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Title: Stable homology of diffeomorphism groups via modular infinity-operads

Abstract: The Madsen-Weiss theorem describes the homology of mapping class groups of surfaces in the stable range and similarly Galatius' theorem describes the homology of $\text{Aut}(F_n)$ in the stable range. Both theorems can be proven by determining the homotopy type of an appropriate bordism category using a "scanning" argument.

I will describe an alternative approach, based on joint work in progress with Shaul Barkan, that computes the homotopy types of these categories by studying symmetric monoidal functors out of them. This will work in the more general framework of modular infinity-operads.

As other examples of this approach we will also obtain the stable homology of 3-dimensional handlebodies and connected sums of $S^1 \times S^2$, confirming two conjectures of Hatcher.