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Yuri Berest* (berest@math.cornell.edu), Department of Mathematics, Cornell University, Ithaca, NY 14850-4201, **Ajay C. Ramadoss** (ajcramad@indiana.edu), Department of Mathematics, Indiana University, Bloomington, IN 47405, and **Wai-kit Yeung** (wy236@cornell.edu), Department of Mathematics, Cornell University, Ithaca, NY 14850-4201.
Representation homology of topological spaces.

Let G be a finite-dimensional affine algebraic group defined over a field k . For any (discrete) group Γ , the set of all representations of Γ in G has a natural structure of an affine k -scheme called the representation scheme $\text{Rep}_G(\Gamma)$. If X is a (based) topological space, the representation scheme $\text{Rep}_G[\pi_1(X)]$ of its fundamental group is an important algebro-geometric invariant of X that plays a role in many areas of mathematics. In this talk, I will discuss a natural extension of this construction, called *representation homology*, that takes into account a higher homotopy information about spaces and has very good functorial properties. Time permitting, I will explain the relation of representation homology to other homology theories associated with spaces, including higher Hochschild homology, S^1 -equivariant homology of free loop spaces and stable homology of automorphism groups of f.g. free groups \mathbb{F}_n .

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