1134-18-134 **Michael Shulman*** (shulman@sandiego.edu) and **Tom Leinster**. *Magnitude homology of enriched categories and metric spaces.* Preliminary report.

Magnitude is a numerical invariant of enriched categories introduced by Leinster, which generalizes the Euler characteristic of (the nerve of) an ordinary category. We show that just as the ordinary Euler characteristic is the alternating sum of ranks of ordinary homology, under suitable hypotheses the magnitude is the alternating sum of ranks of an appropriate sort of Hochschild homology. Applying this to metric spaces, regarded after Lawvere as categories enriched over the poset $[0, \infty]$, we obtain a new "magnitude homology" theory for metric spaces. Since magnitude detects invariants like cardinality, volume, and Minkowski dimension, so does magnitude homology. It also detects other geometric information; for instance, a closed subset $X \subseteq \mathbb{R}^n$ is convex if and only if $H_1^{\mathrm{mag}}(X) = 0$. But many other questions about magnitude homology remain open. (Received August 30, 2017)