1084-55-91 **Peter Bubenik** and **Jonathan Scott*** (j.a.scott3@csuohio.edu), Cleveland State University, Department of Mathematics, 2121 Euclid Ave, RT 1515, Cleveland, OH 44115-2214.
Categorification of Persistent Homology.

We redevelop topological persistence (persistent homology) from a categorical point of view. The main objects of study are $(\mathbf{R}, \leq)$-indexed diagrams in some target category. The set of such diagrams has an *interleaving* distance, which we show generalizes the previously-studied bottleneck distance. To illustrate the utility of this approach, we generalize previous stability results for persistence, extended persistence, and kernel, image and cokernel persistence.

We give a natural construction of a category of ε-interleavings of $(\mathbf{R}, \leq)$-indexed diagrams in some target category, and show that if the target category is abelian, so is this category of interleavings. (Received August 24, 2012)