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Elizabeth Gillaspy*, Department of Mathematics, University of Colorado - Boulder, Campus Box 395, Boulder, CO 80309-0395, and **Alexander Kumjian**. *Cohomology for categories, k -graphs, and groupoids*.

Kumjian, Pask, and Sims have recently studied several cohomology theories for higher-rank graphs. Higher-rank graphs, or k -graphs, are small categories which give rise to both C^* -algebras and groupoids in a natural way. In their paper “On twisted higher-rank graph C^* -algebras,” Kumjian, Pask, and Sims establish the existence of a homomorphism from the categorical 2-cohomology $H^2(\Lambda, A)$ of a k -graph Λ to the continuous cocycle 2-cohomology $H_c^2(\mathcal{G}_\Lambda, A)$ of the associated groupoid. However, this homomorphism is not natural and does not easily generalize to a homomorphism $H^n(\Lambda, A) \rightarrow H_c^n(\mathcal{G}_\Lambda, A)$ for $n \neq 2$.

In this talk, we will discuss joint work with Alex Kumjian in which we use the theory of cohomology for small categories to construct a homomorphism $H^n(\Lambda, A) \rightarrow H_c^n(\mathcal{G}_\Lambda, A)$ for any $n \geq 0$. In order to define our homomorphism, we use a certain relative projective resolution of the trivial \mathcal{G}_Λ -sheaf $\underline{\mathbb{Z}}$, which we believe may be of independent interest. Time permitting, we will also discuss the connection between our homomorphism and that established by Kumjian, Pask, and Sims. (Received August 23, 2015)