1027-46-212 **Cynthia Farthing*** (cfarthing2@math.unl.edu), Department of Mathematics, 203 Avery Hall, University of Nebraska-Lincoln, Lincoln, NE 68588-0130, and **David Pask** and **Aidan Sims**.

Crossed Products by Free Abelian Groups as Higher-rank Graph Algebras.

We show that if α is an action of $\mathbb{Z}^l$ on a finitely aligned k-graph, Λ, by automorphisms, then there is an induced action, $\widetilde{\alpha}$, of $\mathbb{Z}^l$ on the higher-rank graph C^*-algebra of Λ. Furthermore, the crossed-product C^*-algebra, $C^*(\Lambda) \times_{\widetilde{\alpha}} \mathbb{Z}^k$, can be realized as the C^*-algebra of a $k+l$-graph. We will use this fact to give conditions for when the crossed-product C^*-algebra is simple and to calculate the K-theory for a particular class of 2-graphs. (Received February 27, 2007)