

# K-theoretic Dynamics and the C\*-Connes Embedding Problem

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We study group actions on C\*-algebras and notions of finiteness in crossed products by interpreting dynamical phenomena  $K$ -theoretically, that is, by looking at the induced actions on  $K_0(A)$ . We discuss the Connes Embedding problem in the C\*-setting as formulated by Blackadar and Kirchberg: is every separable stably finite algebra MF (i.e. embeddable into an ultraproduct of the universal UHF algebra)? Borrowing lifting and uniqueness results from the classification literature we answer this question in the affirmative for actions of free groups on AT-algebras of real rank zero. We will also see that discrete groups virtually of the form  $G \rtimes \mathbb{F}_r$ , where  $G$  is amenable, admit MF reduced group C\*-algebras. Time permitting we will introduce the noncommutative type semigroup which witnesses the finite or rather infinite nature of C\*-systems. This is joint work with Chris Schafhauser.