Purely infinite groupoid C*-algebras

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Abstract

Many C*-algebras, including C*-algebras coming from tilings, have etale groupoid models. So the classification of etale groupoid C*-algebras has wide applicability. The seminal work of Kirchberg and Phillips showed that simple nuclear purely infinite C*-algebras (Kirchberg Algebras) satisfying the UCT can be classified by their ordered K-theory. It is thus interesting from a classification perspective to know which etale groupoids yield Kirchberg algebras and for this it is essential to understand precisely when an etale groupoid yields a purely infinite C*-algebra. In this talk we show that a simple etale groupoid C*-algebra is purely infinite if the nonzero positive elements of a canonical Cartan MASA are infinite. We further reduce these criteria in the case of higher rank graph groupoids. We also provide a general construction that shows we can use etale groupoids to provide concrete models for many Kirchberg algebras. We apply this construction to the groupoids associated to Bratteli diagrams and deduce that for every simple dimension group D not equal to Z, the stable Kirchberg algebra with K-theory (D,
0
) can be realised as the C * -algebra of an amenable principal groupoid. This work is joint with Lisa Clark, Adam Sierakowski and Aidan Sims.

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