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Groupoid actions - The symmetries of noncommutative spaces

Groupoids are powerful objects with many applications in the theory of Operator Algebras. Important examples of C^*-algebras, like rotation algebras and Cuntz algebras have canonical groupoid models, that is, they can be described in terms of a groupoid. Properties of the C^*-algebra can then be read from the underlying groupoid model.

Groupoids can also be used to describe symmetries of C^*-algebras and the aim of this talk will be to explain how this works. More specifically, we introduce a notion of "action" of one groupoid H on another groupoid G using the theory of groupoid fibrations and explain how this induces an "action" of H on the groupoid C^*-algebra $C^*(G)$. In this setting we have a transformation groupoid $G \rtimes H$ and its C*****-algebra $C^*(G \rtimes H)$ can be described as a sort of "generalised crossed product" $C^*(G) \rtimes H$.