An Introduction To C^*-algebras and How The Arise From Groups

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Abstract

C^*-algebras were initially studied because of their use in quantum mechanics. How- ever, their properties, their connection with other fields of mathematics, and their applications in physics have been studied heavily by researchers for the last 80 years. The basic, finite-dimensional example of a C^*-algebra is the space of $n \times n$ matrices. Roughly speaking, a C^*-algebra is an algebra with a norm, that has an adjoint and some extra properties. In this talk, I will give various examples of C^*-algebras, but I will focus on the ones that arise from groups. After explaining the construction, I will give many examples. In particular, I will explain what C^*-algebras we get if we start with finite, abelian, or other classes of groups. If time permits, I will also briefly explain what properties of a group can be recovered from the C^*-algebra.