

Algebraic K-Theory and Determinants of Toeplitz Operators

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L01 Carson Hall, 4:00 pm
(Tea 3:30 pm Math Lounge)

Abstract

Let H be an infinite-dimensional Hilbert space, and consider the set $B(H)$ of operators on H ; that is the continuous linear maps from H to itself. For operators that are “close” to the identity map, one can define a determinant function that behaves much like the usual determinant of a linear map on a finite-dimensional vector space. This infinite dimensional determinant is difficult to compute directly, so one might ask is there is an easier way to proceed, at least for certain restricted classes of operators. For a certain algebra of operators called the Toeplitz operators, there is indeed a beautiful formula for computing the determinant, and surprisingly, this formula is closely related to the connecting map in algebraic K-theory.

In my talk, I will define the algebra of Toeplitz operators, state the determinant formula for these operators, show how it relates to algebraic K-theory, and discuss generalizations of these results. I will not assume any prior knowledge of operator theory or algebraic K-theory, and therefore the talk (at least the first two-thirds) should be accessible to graduate students.