



Speaker: Todd Kemp
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Thursday, October 26, 2017

2:00 PM

125 Hayes-Healy Hall

Title: The Complex-Time Segal-Bargmann Transform

Abstract:

The Segal--Bargmann Transform (aka Coherent State Transform) is a unitary isomorphism between the Heisenberg and Fock representations in quantum mechanics, which generalizes to any compact type Lie group. It is essentially the analytic continuation of the heat semigroup, mapping L^2 of the heat kernel isomorphically onto holomorphic L^2 of an appropriate heat kernel measure on the complexified group. Around the turn of the Century, Brian Hall and Bruce Driver showed that the "time" in the heat kernel used to measure L^2 functions in the domain doesn't have to match the "time" in the heat semigroup defining the transform; there is still an isomorphism, with respect to a 2-parameter family of heat kernel type measures in the range. These measures are all invariant in a natural sense, and in simple groups (like most of the classical compact Lie groups), the set of all invariant measures that arise this way is only slightly larger: it is a 3-parameter family. In this talk, I will describe my joint work with Driver and Hall tracing back from this 3-parameter family to discover the final form of the Segal--Bargmann transform: the "time" can actually be complex.