SPHERICAL UNITARY REPRESENTATIONS FOR REDUCTIVE GROUPS

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A classical problem in representation theory, motivated by abstract harmonic analysis and number theory, is the study of unitary representations of *reductive* algebraic groups (for example the general linear, symplectic, or orthogonal groups) defined over real and p-adic fields.

A *unitary representation* of a group G is a continuous homomorphism π from G to the group of unitary operators on a complex Hilbert space. One defines the *irreducible* unitary representations to be those without proper closed invariant subspaces. Of particular interest is the identification of the *spherical* irreducible unitary representations of G, that is, those which have nontrivial fixed vectors under the action of a maximal compact subgroup K. The main motivation for their study comes from the theory of automorphic forms.

In this talk, I will present the background for this problem, and report on joint work with D. Barbasch.