THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Algebraic Geometry and Representation Theory Seminar

on Wednesday, Oct 06, 2021at 16:30

Zoom at: https://weizmann.zoom.us/j/98304397425

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Finite multiplicities beyond spherical pairs

Abstract:

Let G be a real reductive algebraic group, and let H be an algebraic subgroup of G. Itis known that the action of G on the space of functions on G/H is "tame" if this space is spherical. In particular, the multiplicities of the space of Schwartz functions on G/H are finite in this case. I will talk about a recent joint work with A. Aizenbud in which we formulate and analyze a generalization of sphericity that implies finite multiplicities in the Schwartz space of G/H for small enough irreducible smooth representations of G. In more detail, for every G-space X, and every closed G-invariant subset S of the nilpotent cone of the Lie algebra of G, we define when X is S-spherical, by means of a geometric condition involving dimensions of fibers of the moment map. We then show that if X is S-spherical, then every representation with annihilator variety lying in S has (at most) finite multiplicities in the Schwartz space of X. For the case when S is the closure of the Richardson orbit of a parabolic subgroup P of G, we show that the condition is equivalent to P having finitely many orbits on X. We give applications of our results to branching problems. Our main tool in bounding the multiplicity is the theory of holonomic D-modules. After formulating our main results, I will briefly recall the necessary aspects of this theory and sketch our proofs. The talk is based on arXiv:2109.00204.