מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Algebraic Geometry and Representation Theory Seminar

on Wednesday, Feb 10, 2021
at 16:30

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

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Real orbits in spherical homogeneous spaces

Abstract:

The talk is based on a joint work in progress with StÃ©phanie Cupit-Foutou. Given a homogeneous variety X for a complex algebraic group G defined over real numbers, the real Lie group G(R) usually acts non-transitively (but with finitely many orbits) on the real locus X(R). A natural problem, to which many classification problems in algebra and geometry reduce, is to describe the orbits of G(R) on X(R). We address this problem for spherical homogeneous spaces, G being a connected reductive group. In this talk I'll concentrate on two cases: (1) X is a symmetric space; (2) G is split over R. The answer is similar in both cases: the G(R)-orbits are classified by the orbits of a finite group, which coincides or is closely related to the so-called "little Weyl group" W_X, acting in a fancy way on the set of orbits of T(R) in Z(R), where T is a maximal torus in G and Z is a "Brion-Luna-Vust slice" in X. The latter orbit set can be described combinatorially. We use different tools: Galois cohomology in (1) and action of minimal parabolic subgroups on Borel orbits together with Knop's theory of polarized cotangent bundle in (2). We expect that the second approach can be extended to the non-split case.