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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PhD Student Seminar

K-orbits on Flag Varieties and B-orbits on Symmetric Varieties

By

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Abstract

For G a reductive algebraic group over an algebraically closed field with characteristic not equal to two, let θ be a holomorphic involution of G, and let $K=G^{\theta}$ be the corresponding fixed point subgroup. Let B be a Borel subgroup of G. It is a classical result that $V = K\backslash G/B$ is finite, treated either as a set of K-orbits in the flag variety G/B, or B-orbits in the symmetric variety $K\backslash G$, or simply as $(B\times K)$-orbits in G. There is a natural partial order on V given by the inclusion of the orbit closures. Classifying all such orbits gives information on the representation theory of real semisimple groups, generalises Schubert varieties, and gives the structure of the torus-equivariant cohomology of flag varieties.

In this seminar, I will survey the classification of the orbits $V = K\backslash G/B$, focusing on the case when G is the complex general linear group. These results are due to Matsuki and Ōshima, Richardson and Springer, and Yamamoto. Then I will discuss some new work generalising these results to the affine case, where G is the loop group of complex general linear group.

Date : 9 May 2023 (Tuesday)
Time : 4:45 pm
Venue : Room 5564 (Lifts 27/28)

All are Welcome!