



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

ALGEBRA AND GEOMETRY SEMINAR

Unitary representations of real groups and localisation theory for Hodge modules

by

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Abstract

I will explain recent joint work with Kari Vilonen, in which we prove a conjecture of Schmid and Vilonen linking mixed Hodge modules on flag varieties to unitary representations of real reductive Lie groups. The main idea behind our work is to upgrade Beilinson-Bernstein localisation from D-modules to mixed Hodge modules. When it applies, this endows everything in sight with a canonical filtration, the Hodge filtration, which we prove has some extremely nice properties, such as cohomology vanishing and global generation. In the context of real groups, we also prove that the Hodge filtration “sees” exactly which representations are unitary. We hope that this will lead to new progress on the very old problem of determining the unitary dual of a real group.

Date : 9 October 2023 (Monday)

Time : 3:00pm – 4:30pm

Venue : Room 5560 (Lifts 27/28)

Zoom : <https://hkust.zoom.us/j/95221420856> (Passcode: 390519)

All are Welcome!

Note: The talk will be delivered via Zoom but will also be streamed at Room 5560.
Everyone is welcome to join us in person at Room 5560.