Lodha Mathematical Sciences Institute

Lodha Supremus, 16th Floor, Mumbai

Seminar Announcement

14 January 2026

Seminar I: *The geometry of Hessenberg and Lusztig varieties*

Patrick Brosnan
University of Maryland
Time: 14:00–15:00

Abstract.
Hessenberg and Lusztig varieties are two families of closed subvarieties of generalized flag varieties with representation theoretic significance. In the case of Hessenberg varieties, one associates to a combinatorial piece of data a family of varieties living over the Lie algebra of a reductive group G. (For the general linear group, that combinatorial piece of data is just an integer-valued function. In general, it can be thought of as a G-equivariant subbundle of the tangent bundle of the flag variety.) In the case of Lusztig varieties, one associates to each element of the Weyl group of G a family of varieties over G. I'll talk about some basic results on the geometry of Hessenberg varieties. Then I'll state a theorem on the automorphisms of deformations of Hessenberg varieties. Finally, I'll state a theorem about the relationship between Hessenberg and Lusztig varieties.

Seminar II: ***Degree three unramified cohomology of homogeneous spaces***

Lucas Lagarde
Université Sorbonne Paris Nord
Time: 15:10–16:10

Abstract.
Finding a tractable description for the unramified cohomology groups of a given smooth, proper and geometrically integral variety over a field of characteristic 0 is of great interest due to their connections with rationality, algebraic cycles and local-global principles for rational points. Already for the Brauer group, much work has been done e.g. in the case of smooth compactifications of homogeneous spaces of linear groups. However, determining unramified cohomology groups in degree 3 already is a more delicate task for such homogeneous spaces (work of Peyre, Kahn-Nguyen, Merkurjev, Blinstein-Merkurjev, ...). In this talk, we will discuss the case of finite stabilisers. If $X = SL_{n,k}/G$ for some finite k-group G, we provide a general formula for the group $H^3_{nr}(k(X), \mathbb{Q}/\mathbb{Z}(2))$. Assuming that G is a constant k-group and that k contains the roots of unity of order dividing $|G|$, we show that $H^3_{nr}(k(X), \mathbb{Q}/\mathbb{Z}(2))$ is universally trivial as soon as it is trivial over an algebraic closure of k and the Bogomolov multiplier of G is trivial. If k has cohomological dimension 1, the vanishing of the Bogomolov multiplier of G notably implies that Galois descent is universally satisfied for codimension 2 cycles on any smooth and proper variety that is birationnally equivalent to X.