8 December, 19:30, Zoom 675-315-555 (302)
Algebraic groups seminar, Ning Guo (Institut de Mathématique d'Orsay)
"The Grothendieck-Serre conjecture over valuation rings"

Abstract:

We establish the Grothendieck–Serre conjecture over valuation rings: for a reductive group scheme G over a valuation ring V with fraction field K, a G-torsor over V is trivial if it is trivial over K. This result is predicted by the original Grothendieck–Serre conjecture and the resolution of singularities. The novelty of our proof lies in overcoming subtleties brought by general nondiscrete valuation rings. By using flasque resolutions and inducting with local cohomology, we prove a non-Noetherian counterpart of Colliot-Thélène– Sansuc's case of tori. Then, taking advantage of techniques in algebraization, we obtain the passage to the Henselian rank one case. Finally, we induct on Levi subgroups and use the integrality of rational points of anisotropic groups to reduce to the semisimple anisotropic case, in which we appeal to properties of parahoric subgroups in Bruhat–Tits theory to conclude.