



Number Theory Seminar

The Grothendieck-Serre conjecture for constant reductive group schemes

Dr. Fei LIU

Southern University of Science and Technology

Abstract

A conjecture proposed by Grothendieck and Serre in the late 1950s asserts that a principal bundle under a reductive group scheme G over a regular local ring A has an A -point provided it has a K -point, where $K = \text{Frac}(A)$. Although this conjecture was resolved by Fedorov and Panin in 2015 in the equi-characteristic case (i.e., A contains a field), the mixed characteristic case has remained widely open. In this talk, I will present a proof for the case where A is (essentially) smooth over a DVR V and G descends to a reductive group scheme over V , i.e., the case of a 'constant' reductive group scheme. As a corollary, we settle the constant reductive group case of the Bass-Quillen statements concerning the homotopy invariance of principal bundles. Quite generally, our method applies to arbitrary valuation rings V , which may be highly non-Noetherian. This is a joint work with Ning Guo.

Date: May 02, 2023 (Tuesday)

Time: 2:00 - 3:30pm

Venue: Rm 320A, Run Run Shaw Bldg., HKU