

Seminarium geometrów

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The cohomology of classical arithmetic groups

Abstract: Cohomological results for arithmetic groups and related spaces, such as symmetric spaces and buildings, are of paramount importance in algebra, geometry, and number theory. In this setting, a famous result of Lee–Szczarba states that the cohomology of $SL(n, \mathbb{Z})$ with rational coefficients is zero in dimension $n(n - 1)/2$. The first half of this talk will be an overview on cohomology computations for arithmetic groups, with focus on the work of Borel and Serre on associated symmetric spaces and duality. We will then focus on arithmetic subgroups of classical semisimple groups, such as symplectic and orthogonal groups, and shall see how to combine the Borel–Serre construction with a result of Tóth to obtain a generalization of the theorem of Lee–Szczarba: the rational cohomology of such arithmetic groups vanishes in their virtual cohomological dimension. This is based on joint work with B. Brück and R. Sroka.

streaming via ZOOM:

Meeting ID: 967 6507 7409

Meeting password: “GS” (two letters) followed by the Euler characteristic of the closed orientable surface of genus 89.