

# Seminarium geometrów

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## Kazhdan constants by root systems

Abstract: Using a direct computer-assisted calculation and a form of induction, we (with D. Kielak and P. Nowak, [KKN21]) computed the best known lower bounds for  $SL_n(\mathbb{Z})$  with  $n > 5$ . The key insight of the induction is the identification of new elements of interest in the group rings  $\mathbb{Z}SL_n(\mathbb{Z})$ .

In this talk we will explore the connection of these elements, called the adjacency operators  $\text{Adj}$ , to the root systems of the underlying Chevalley groups. As an outcome, we are able to give the very first lower bounds for universal Chevalley groups over  $\mathbb{Z}$  corresponding to all irreducible root systems of rank at least 2. In particular, we give the first lower bounds for Kazhdan constants for the symplectic groups  $Sp_{2n}(\mathbb{Z})$ , with respect to the usual (Steinberg) generators.

*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.