

# Averages of $\mathrm{SL}_2(\mathbb{R})$ Automorphic Kernel and arithmetic applications

Lasse Grimmelt

University of Oxford

Counting integer solutions to equation with  $\mathrm{SL}_2$  symmetry (in the easiest case:  $ad-bc=h$ ) is a surprisingly deep and important problem in analytic number theory. In this talk that is based on recent work with J. Merikoski, I will present a modern perspective on this. Our modern perspective is based on the spectral theory of automorphic kernel and with it we can count solutions to equations with  $\mathrm{SL}_2$  symmetry with uniformity and in a more conceptual manner than was possible previously.