

Manfred Einsiedler (ETH Zürich)

Mini-course *Equidistribution on homogeneous spaces, a bridge between dynamics and number theory*

- Introduction to Homogeneous Dynamics

Geodesic flow and horocycle flow on hyperbolic surfaces. The quotient $SL(n, \mathbb{R})/SL(n, \mathbb{Z})$ and dynamics.

- Disjointness for x^2 and x^3 and Kloosterman sums

We discuss briefly how disjointness results for systems related to the x^2/x^3 conjectures give an ineffective version of Kloosterman sums, and interpret the latter as an equidistribution result.

- Kloosterman sums and spectral gap

We indicate how Kloosterman sums give an effective rate of mixing for the geodesic flow.

- Sparse equidistribution of primitive points

Rational points on the periodic horocycle orbit satisfy amazing behavior under the geodesic flow. First they are on the compact period orbit, then they become equidistributed (effectively so), and finally they arrange themselves again on a periodic orbit before they venture into the cusp.

- Disjointness

We indicate how disjointness of higher rank diagonal flows can be used to obtain further equidistribution results of rational points on periodic horocycle orbits.