Bernoullis Tafelrunde

Graduate Student Seminar

Monday, 3 October 2022, 12:15-13:00
Seminarraum 05.002, Spiegelgasse 5

Gerold Schefer

University of Basel

Counting Torsion Points on Algebraic Subvarieties of the Algebraic Torus

Abstract

Let K be an algebraically closed field and $\mathbb{G}_m^n = (K^*)^n$. We call a point torsion, if it has finite order. We estimate the growth rate of the function which counts the number of torsion points of order at most T on an algebraic subvariety of $\mathbb{G}_m^n$; the vanishing locus of a bunch of Laurent polynomials. For torsion cosets, the irreducible components of algebraic subgroups of $\mathbb{G}_m^n$, we are able to find the first asymptotic term. For all other irreducible subvarieties we get a bound which is power saving compared to the result for torsion cosets. In characteristic zero the Manin-Mumford Conjecture reduces the problem to torsion cosets. If K is the algebraic closure of a finite field we have lower bounds.