



UNIVERSITÄT
SALZBURG

SALZBURG MATHEMATICS COLLOQUIUM

Winter 2026/27

Fabrizio Barroero (Uni Roma Tre)

„On the polynomial Pell equation“

November 26, 2026

Abstract:

The classical Pell equation $x^2 - dy^2 = 1$ has nontrivial ($y \neq 0$) integer solutions for every positive nonsquare integer d . What happens when integers are replaced by polynomials? Given $D \in K[t]$, where K is a field, we ask whether

$$A^2 - DB^2 = 1$$

has polynomial solutions with $B \neq 0$. This apparently simple change leads to a rich interplay between algebra, geometry, and analysis.

Starting from explicit examples, we will explore how solvability is related to points of finite order on elliptic curves and abelian varieties, and how it behaves as the coefficients of D vary. In particular, in the complex case, we will see how solvable equations can be exceptional in an algebraic sense and yet form a dense set.

The talk is based on joint work with Laura Capuano and Umberto Zannier.

Thursday, **15:00-15:45**
Hörsaal 414, 1. Stock