Gerd Faltings:
From the Mordell Conjecture to the Abel Prize

Alexandros Konstantinou

International Center for Mathematical Sciences –

Institute of Mathematics and Informatics, Bulgarian Academy of Sciences

Abstract. Faltings' proof of the Mordell conjecture is one of the landmark results of twentieth-century mathematics. It states that a smooth projective curve of genus at least 2 over the rationals has only finitely many rational points. For this work, Faltings received the Fields Medal in 1986. In 2026 he was awarded the Abel Prize, whose citation described him as "a towering figure in arithmetic geometry". He is one of only eight mathematicians to have received both honours.

This talk gives an accessible introduction to the mathematics surrounding this theorem. The central question is classical: when does a polynomial equation have rational solutions? Arithmetic geometry reframes this as the study of rational points on curves, and the behaviour of these points turns out to depend strongly on the geometry of the curve. The genus is the organising principle, with conics, elliptic curves, and curves of genus at least 2 behaving in fundamentally different ways.

We will explain why Faltings' theorem marked a decisive break from what came before, and why it remains a central theorem in modern number theory.