TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA
PhD Course 2026

Title: **The Arithmetic of Elliptic Curves**

Speaker: **Eftymios Sofos**

- Schedule: first Semester
- January-February
- Where: Department of Mathematics “Tor Vergata”

Abstract

This 20-hour graduate-level course explores the intersection of algebraic geometry and number theory. The primary objective is to investigate the mathematical framework underlying the Birch and Swinnerton-Dyer (BSD) Conjecture, one of the seven Millennium Prize Problems. The BSD conjecture proposes a deep connection between the algebraic structure of rational points on an elliptic curve and the analytic behavior of its associated L-function. By bridging these seemingly far away fields, the course highlights the unity of pure mathematics while acknowledging its significant practical applications-most notably in Elliptic Curve Cryptography (ECC), which remains a cornerstone of modern digital security and financial transactions.