# DECODING ELLIPTIC CURVES...

## IPM introductory seminars on Algebraic Geometry and Number Theory

School of Mathematics

**Speaker:** Amir Jafari, from Sharif University of Technologoly

**Date & Time:** Thursday, 23rd November 2023 (2nd Azar 1402) at 13:30 (Tehran time)

**Location:** IPM, Niavaran Building, Lecture Hall 1

**ABSTARCT.** Elliptic curves lie at the intersection of analysis, geometry, algebra, and arithmetic. They have a rich and profound history in mathematics going back to antiquity. From the analytic point of view, elliptic curves are Riemann surfaces of genus one and are the natural domain of the definition of elliptic functions (a generalization of trigonometric functions with two independent periods). From the algebraic point of view, elliptic curves are abelian varieties of dimension one. From the arithmetic point of view, elliptic curves can be defined over global fields, local fields, or finite fields that give rise to Galois representations. The arithmetic of elliptic curves is linked to deep questions in diophantine equations that go back to the investigations of Fermat in the seventeenth century. The solution to Fermat's notorious last theorem by Wiles and Taylor was through elliptic curves and modular forms.

This talk is an elementary introduction to this fascinating part of mathematics. We will define elliptic curves and discuss some of their analytical, geometrical, algebraical, and arithmetical properties.