

DECODING

BIRATIONAL GEOMETRY...

IPM
introductory
seminars on
Algebraic
Geometry and
Number Theory

School of Mathematics

Speaker: Rahim Zaare-Nahandi,
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Date & Time: Wednesday, 3rd
January 2024 (13th Dey 1402) at
3:30 pm (Tehran time)

Location: IPM, Niavaran Building,
Lecture Hall 7



ABSTRACT. Birational Geometry is a unique aspect of algebraic geometry that distinguishes it from other geometries. It was extensively utilized by the Italian school in the birational classification of algebraic curves and surfaces during the early 20th century. This culminated in the work of Zariski and his collaborators, including Hironaka, on the resolution of singularities in the 1940s, a pursuit that is still ongoing. The birational classification of higher dimensional varieties, as demonstrated by scholars like Mori in the 1980s, and the subsequent development of the Minimal Model Program, have underscored the significance of birational geometry. The purpose of this presentation is to introduce some initial concepts in birational geometry. After recalling some fundamental concepts in algebraic geometry, we will provide several examples of birational equivalence and rationality, and briefly discuss results on the resolution of singularities. We will also explore the birational classification of varieties, including the birational classification of surfaces via the Castelnuovo Contraction Theorem. Finally, we will provide a brief overview of the "Minimal Model Program."