Oklahoma State University

Colloquium

Title

Multiple Structures in Algebraic Geometry: New approaches to classical and current problems

Speaker:	Jayan Mukherjee, University of California, Riverside
Date:	Feb 7, 2023
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Room:	Virtual

Abstract: A distinctive feature of the theory of schemes in algebraic geometry is the presence of nilpotents in its rings of local functions. This gives a rich interplay between algebra of the local functions and the geometry of the scheme. Non-reduced schemes called ropes and ribbons have played a significant role in the theory of algebraic curves in recent years. We develop techniques to systematically deal with the existence and smoothing of ropes in all dimensions. We show how this provides a unifying framework to some of the central themes in algebraic geometry. In this talk I will illustrate this by connecting a classical question of Enriques posed in 1949 on the existence of so called canonical surfaces–now generalized to all dimensions–to constructing new components of moduli of varieties of general type in all dimensions. The existence of such components is unique to higher-dimensional geometry and is the focus of current research. We also connect our work to long-standing problems, such as Hartshorne's Conjecture and the compactification of moduli spaces.