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Department of Mathematics and Computer Science

Colloquium

The D-equivalence conjecture and hyper-Kähler geometry

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Abstract:

The derived category of coherent sheaves serves as a fundamental invariant for algebraic varieties, extending the collection of all holomorphic vector bundles. A key advantage of considering the derived category is that it often exhibits far richer symmetries than the variety itself. These additional symmetries play a crucial role in areas such as geometry, representation theory, and mathematical physics. In this talk, I will first discuss the D-equivalence conjecture of Bondal-Orlov, which is a long standing conjecture concerning birational geometry and derived categories of Calabi-Yau varieties. I will then present a recent approach in the joint work with Davesh Maulik, Qizheng Yin, and Ruxuan Zhang, relating the D-equivalence conjecture to the theory of hyperholomorphic bundles in hyper-Kähler geometry. This leads to a proof of the D-equivalence conjecture for all Calabi-Yau varieties of K3 type.

4 – 5pm
Tuesday, October 22, 2024
Room 204, Smith Hall