



ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology
Department of Mathematics

Motivic Nearby Functors and Recent Developments

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In the quest for discovering exotic spheres, Milnor studied the topology of complex hypersurface singularities, which eventually led to the notion of Milnor fibers. Around the same time, Grothendieck and Deligne globalized this concept to define the nearby and vanishing cycles functors, which later played a crucial role in the proof of the Weil conjectures. These foundational ideas, introduced over half a century ago, have since evolved in various directions. In motivic homotopy theory, a notable descendant is the motivic nearby functor, originally constructed by J. Ayoub. This functor can be regarded as the “seventh operation” in the yoga of six-functor formalism developed by Grothendieck’s school, and it exhibits many remarkable properties. In this talk, I will introduce the theory of motivic nearby functors and discuss some recent developments.

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