



The Hong Kong University of Science and Technology

Department of Mathematics

Hong Kong Geometry Colloquium

Quantum K-theory

by

Prof. Yuan-Pin LEE
Academia Sinica, Taiwan

Abstract

Quantum K-theory is a K-theoretic version of Gromov-Witten theory. In this talk, I will present some thoughts on quantum K-theory, including some (easy) lessons one can learn from the construction of the quantum K-theory. Knowledge about Gromov-Witten theory is not assumed.

Date : Saturday, 23 November 2024
Time : 9:30am - 10:30am
Venue : Room 2463 (near Lifts 25/26)
Academic Building, HKUST

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### **The Geometry of Grassmannians of Complexes and Their Applications**

by

***Prof. Qingyuan JIANG***  
***Department of Mathematics, HKUST, HK***

#### **Abstract**

Derived Algebraic Geometry (DAG), pioneered by Toën, Vezzosi, Lurie, and others, enhances classical algebraic geometry by incorporating homotopy theory concepts and ideas. Using the DAG framework, we can extend Grothendieck's theory of Grassmannians of quasi-coherent sheaves to those of complexes. This extension is crucial for uncovering the inherent structures of Grassmannian fibrations and for unifying and extending various formulas. Additionally, it is valuable for constructing and studying moduli spaces and their wall-crossings.

In this talk, I will outline the construction and properties of derived Grassmannians of complexes, and reveal structural results of their Chow groups, K-theory, and derived categories. This includes a unifying formula that simultaneously extends existing formulas for Grassmannian bundles, blowups, standard flips, projectivizations, and Grassmannian flips. Furthermore, I will discuss the application of this framework in geometric representation theory. This talk is based on a series of my previous papers and ongoing collaborations with Weiping Li and Yu Zhao.

**Date : Saturday, 23 November 2024**  
**Time : 10:45am - 11:45am**  
**Venue : Room 2463 (near Lifts 25/26)**  
**Academic Building, HKUST**

***All are welcome!***

*Light refreshment will be provided in Room no.3493 from 10:30am to 10:45am*