



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

ALGEBRA AND GEOMETRY SEMINAR

Smooth and proper algebras via stable $(\infty,2)$ -categories

by

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Abstract

Since Grothendieck, the notion of an abelian 1-category has provided a natural setting to do algebra which encompasses both categories of modules and categories of sheaves. Since Lurie, the notion of a stable $(\infty,1)$ -category has provided a similar setting to do derived algebra, encompassing derived categories of modules and sheaves, and improving upon the notion of a triangulated category due to Verdier.

In this talk, we discuss a few possible notions of stable $(\infty,2)$ -category, motivated by enriched category theory. Examples include the $(\infty,2)$ -category of dg categories, the $(\infty,2)$ -category of stable $(\infty,1)$ -categories, and various $(\infty,2)$ -categories of stacks of stable $(\infty,1)$ -categories. The intention is to provide a natural home for the study of such $(\infty,2)$ -categories, which are of interest in areas such as the Geometric Langlands program, secondary algebraic K-theory, and derived algebraic geometry.

We discuss work in progress on showing that our notions of stable $(\infty,2)$ -category are equivalent. As an application, we show for example that every smooth and proper algebra over a regular commutative Noetherian ring k may be constructed from kk by iterating two simple operations: glueing along a perfect bimodule, and 2-idempotent splitting.

Date : 25 September 2023 (Monday)

Time : 3:00pm – 4:30pm

Venue : Room 5560 (Lifts 27/28)

All are Welcome!