



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PURE MATHEMATICS

**Rank-Metric Codes: Geometry,
Constructions, and Open Problems**

by

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Abstract

Rank-metric codes have become a central topic in modern coding theory, with connections to finite geometry, network coding, cryptography, and combinatorics. Among them, maximum rank distance (MRD) codes play a role analogous to that of MDS codes in the Hamming metric, but their structure and classification present several phenomena that have no direct counterpart in the classical setting.

In this talk, I will give an overview of some of the main geometric ideas underlying rank-metric codes, focusing on their interplay with linear sets, scattered subspaces, and related structures in finite geometry. I will then discuss a selection of current open problems, ranging from the construction and classification of MRD codes to questions concerning generalized weights, minimal rank-metric codes, and extremal geometric configurations. Particular attention will be given to problems where a geometric reformulation may offer new tools and perspectives.

The aim of the talk is not only to survey some recent developments, but also to highlight directions in which finite geometry and coding theory can interact to address problems that remain largely open.

Date : 19 August 2026 (Wednesday)

Time : 2:00p.m. – 2:50p.m.

Venue : Room 4504 (near Lift 25/26)

All are Welcome!