



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

## PHD STUDENT SEMINAR

# Convex Relaxation of Sparse Phase Retrieval Problem

By

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### Abstract

We study the sparse phase retrieval problem, recovering an  $s$ -sparse real vector from  $m$  magnitude-only random Gaussian measurements. While successful recovery is theoretically possible with  $O(s \log(en/s))$  measurements, many algorithms require  $O(s^2 \log n)$  measurements to provably converge to the true solution linearly. To reduce the number of measurements, we first reformulate the problem as a completely positive program. However, a completely positive program is NP-Hard in general. To obtain a tractable algorithm, we describe a hierarchy of semidefinite relaxation for the completely positive program. Further, we analyze the sampling complexity of the roughest and tightest relaxation.

**Date : 30 April 2024 (Tuesday)**

**Time : 4:30pm**

**Venue : Room 4503 (Lifts 25-26)**

*All are Welcome!*