

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

COLLOQUIUM

AI for Mathematics: From Digitization to Intelligentization

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Date:	June 27, 2025 (Friday)
Time:	3:00 - 4:00pm
Venue:	Rm 101, KK Leung Bldg., HKU

Abstract

Mathematical research faces numerous challenges that significantly limit its efficiency, and overcoming these obstacles increasingly calls for assistance from artificial intelligence (AI). "AI for Mathematics" (AI4M) is an emerging interdisciplinary field specifically designed to address these challenges, with core tasks including automated theorem proving and disproving, semantic search within mathematical literature, and the automatic formalization of mathematical knowledge.

In this talk, I will first discuss the motivation behind integrating AI into mathematics, highlighting the key challenges and practical needs within mathematical research. Then, I will introduce several representative AI4M studies from recent years, comparing different technological approaches and discussing their respective advantages and limitations. I will further explain why formal verification—or the "digitization" of mathematics—is crucial for significantly enhancing AI's mathematical reasoning abilities. Next, I will outline the overall research agenda of our AI4M group at Peking University, sharing some of our recent preliminary results. Finally, I will present our vision for the future of AI4M. We believe that AI will not only assist mathematicians in handling repetitive or mechanical tasks such as routine proofs, but more importantly, will facilitate deep integration of knowledge across different areas of mathematics. This advancement has the potential to enable mathematicians to concentrate more fully on uncovering fundamental mathematical insights, ushering in a new era of creativity and discovery.

All are welcome