

國立中山大學應用數學系

學術演講

講者：曾培倫 博士 (New York University Abu Dhabi)

講題：Combinatorial Theory in Free Probability

時間：2025/1/7 (Tuesday) 14:10~15:00

地點：理 SC 4009-1 教室

茶會：13:45

Abstract

Free probability theory, introduced by D. Voiculescu in the 1980s, provides a framework for studying the limiting behavior of random matrices through the concept of free independence—an analogue of classical independence. In 1994, Speicher introduced free cumulants, offering a combinatorial approach to understanding freeness. In this talk, we will begin by presenting the combinatorial aspects of free probability theory and exploring some of its applications in random matrix theory.

We will also discuss other notions of non-commutative independence, such as Boolean and monotone independence, and highlight their connections to graph theory.

In the final part of the talk, we will introduce the concept of infinitesimal freeness, a generalization of freeness. This framework not only aids in analyzing the limiting behavior of random matrices but also captures their corrections. Furthermore, it enables the construction of random matrix models that exhibit asymptotic Boolean and monotone independence.

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