

國立中山大學應用數學系

學術演講

講者：François Bienvenu

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講題：An introduction to local limits of random graphs

時間：2026/04/14 (Tuesday) 14:10 ~ 16:00

地點：理 SC4009-0 教室

茶會：13:30

Abstract

Random graphs provide simple but powerful models for large complex networks. Although their definition is often elementary, their structure can be remarkably rich and difficult to analyze directly. One way to understand certain aspects of such graphs is through the notion of a local limit, which captures the geometry seen from a typical vertex.

With this point of view in mind, we will focus on the Erdős–Rényi model $G(n, \lambda/n)$ as a guiding example. After introducing the exploration process of connected components, we will explain why the neighborhood of a typical vertex in $G(n, \lambda/n)$ converges, as $n \rightarrow \infty$, to a Galton – Watson tree with Poisson offspring distribution.

We will then discuss how this branching-process viewpoint provides a natural explanation for the phase transition at $\lambda = 1$, separating the regime in which all components are small from the regime in which a giant component emerges.

The course is intended as an overview accessible to non-specialists: the focus will be on intuition, key ideas, and a few central arguments, rather than on full technical proofs.

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