

# Higher-rank graphs and their algebras

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007 Kemeny Hall, 4:00 pm  
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## Abstract

Over the past decade, algebras associated to directed graphs have played a prominent role in operator algebra. These algebras have an attractive structure theory, which relates structural properties of the algebra to the behaviour of paths in the graph, and they also provide tractable models for the classification program of infinite simple  $C^*$ -algebras. In the past few years, the focus has moved to a family of higher-rank graphs introduced by Kumjian and Pask in 2000. The *higher-rank graph algebras* associated to these graphs are harder to work with, but also provide models for a much wider range of simple  $C^*$ -algebras.

In this talk we will explain what higher-rank graphs are, and how one can visualise them in terms of coloured directed graphs; this part of the talk is purely combinatoric in nature. We will then discuss the algebras of higher-rank graphs, and describe examples which provide models for some interesting simple  $C^*$ -algebras which we know cannot be ordinary graph algebras.