Speaker

Khaydar Nurligareev

Workshop

ALEA 2024

Location and date

CIRM, Marseille, March 14, 2024

Title

Asymptotics of endhered patterns in perfect matchings

Abstract

In this talk, we discuss the behavior of patterns of some special type in perfect matchings. Here, by a *perfect matching* of size n, we mean a configuration of $2n$ points on a line, which are consecutively labeled with integers from 1 to $2n$ and connected into disjoint pairs by n edges. We are interested in patterns consisting of p edges, such that the set of starting points is an interval, and so is the set of ending points. The study of this type of patterns, which we call *endhered* (end-adhered), is motivated by its connections to RNA secondary structures with allowed pseudoknots.

Let $a_{n,k}$ be the number of perfect matchings of size n with k occurences of a given pattern. We show that in the case of $p = 2$ the corresponding bivariate exponential generating function has a closed exact form, which allows us to obtain the asymptotic behavior of $a_{n,k}$, as n tends to infinity, by simple means. In the general case, for obtaining generating functions we apply the Goulden-Jackson cluster method, while the asymptotics come from Borinsky's approach.

This talk is based on the ongoing work with Célia Biane and Sergey Kirgizov.