

One Day Workshop on Combinatorics

Wednesday, July 29, 2020

Auditorium, Institute of Mathematics, Academia Sinica

10:00 - 11:00 Michael Fuchs 符麥克 (NCCU)

Title: *Asymptotic enumeration of tree-child networks*

Abstract:

Tree-child networks are one of the the most popular subclasses of phylogenetic networks and they are widely-used in reticulate evolution. Until very recently, little has been known about the number of tree-child networks with n leaves. The first result is from a 2015 paper of McDiarmid, Semple and Welsh where they showed that the main term of the asymptotics contains n^{2n} as largest term. In this talk, we explain our recent refinement of this result which answers questions left open in their paper. The talk is based on joint work with Guan-Ru Yu (University of Vienna) and Louxin Zhang (National University of Singapore).

11:10 - 12:10 Wei-Hsuan Yu 俞韋亘 (NCU)

Title: *Bounds on spherical s -distance sets*

Abstract:

A finite subset X on the unit sphere S^d is called an s -distance set if its angle set $A(X) := \{ \angle x, y : x, y \in X, x \neq y \}$ has size s . We consider the maximum size of such a set for small s and we will talk its relation to real equiangular tight frames (ETFs), energy minimization problems and Levenstein-equality packings.

13:30 - 14:30 Yuan-Hsun Lo 羅元勳 (NPTU)

Title: *On the study of signed Mahonian polynomials*

Abstract:

In this talk, we will introduce some new signed Mahonian polynomials over the complex reflection group $G(r, 1, n) = C_r \wr \mathfrak{S}_n$, where the “sign” is taken to be any of the $2r$ one-dimensional characters and the “Mahonian” statistics are the lmaj defined by Bagno and the sor given by Eu *et al.* We will also extend Wachs and Wachs and Biagioli’s signed Euler-Mahonian identities over Coxeter groups of types A_n and B_n to $G(r, 1, n)$. Analogous results over Coxeter group of type D_n are derived as well.

14:50 - 15:50 Chun-Yen Shen 沈俊嚴 (NTU)

Title: *Algebraic methods in additive combinatorics*

Abstract:

It has been known that algebraic methods have been found extremely useful in the area of additive combinatorics. In this talk, I will introduce my algebraic proofs that confirm a conjecture of V. Vu that classify all two variable polynomials such that the sum-product phenomena hold. In particular the Bezout's theorem plays an important role in my proof. In addition, some open problems will be discussed in the end of my talk.

16:10 - 17:10 Hsien-Kuei Hwang 黃顯貴 (AS)

Title: *Stirling numbers of the second kind: a history of early developments and an elementary approach to asymptotic normality*

Organizer: Yeong-Nan Yeh 葉永南 (AS)

Contact: 林思潔 (AS) ryannj@math.sinica.edu.tw

Registration:



* 配合台灣大學防疫措施，當天請隨身攜帶身分證件以留下足跡紀錄。

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