会议通知

尊敬的各位同仁：

为加强组合数学研究的交流合作，北京理工大学数学与统计学院将于 2024 年 10 月 13 日主办“北京理工大学组合数学会议 2024（ComBIT24–StanleyFest）”。会议将组织大会报告和 30 分钟邀请报告。我们诚挚地邀请您出席本次会议。会议的基本信息如下。

(1) 报到时间：10 月 12 日下午 4.00–10.30，10 月 13 日上午 8.30–9.30。

(2) 报到/会议地点：北方易尚会议中心（010-61353521）。

(3) 会议时间：10 月 13 日上午 9.30–11.30，下午 2.00–4.30。

(4) 若乘地铁，在地铁房山线“良乡大学城北”站下车，它至会议中心约 4 公里。

(5) 无注册费，会务组协助预定住宿。会议期间参会人员食宿费用自理。

(6) 会议联系人：

- 张凯 15009281959 kai@bit.edu.cn
- 王梦雨 18813059019 mengyu919@icloud.com

北京理工大学数学与统计学院

2024 年 9 月 30 日

回执

(1) 姓名:

(2) 性别:

(3) 工作单位:

(4) 职称:

(5) 联系电话:

(6) 电子邮箱:

(7) 到会交通信息:

- 时间:
- 航班/车次:
- 机场/火车站:

(8) 同行人员信息:

(9) 离会交通信息:

- 时间:
- 航班/车次:
- 机场/火车站:

(10) 住宿信息:

- 大床间 480 元/天，早餐 40 元/人:
- 标准间 428 元/天，早餐 40 元/人:
- 是否与他人拼住房间:
- 其他个性需求（如有):

(11) 发票抬头:

(12) 纳税人识别号:

请于 10 月 8 日前将参会回执（附后）发送至 kai@bit.edu.cn。

北京理工大学组合数学会议 2024

ComBIT24–StanleyFest

9.30	Opening	
9.40	Richard Stanley	Two analogues of Pascal's triangle
10.40	Yeong-Nan Yeh	Eulerian-type polynomials and Stirling permutations
11.40	Photo	
12.00	Banquet	
14.00	Arthur Libo Yang	Stanley's conjectures on distributive lattices
14.35	Shaoshi Chen	Patterns in multi-dimensional permutations
15.10	Lili Mu	Real rooted polynomials and f-polynomials of simplicial complexes
15.45	Coffee break	
16.00	Yibo Gao	Interlacing triangles, Schubert puzzles, and graph colorings
16.35	Peter Long Guo	Zero-one characters of flagged Weyl modules
17.15	Buffet	

- 会场：北方易尚会议中心第二会议室
  Location: Conf rm 2, Northern Easun Conference Center, Fangshan Distr, Beijing.
- 日期：2024 年 10 月 13 日
  Date: Oct 13, 2024.

Richard Stanley is an Emeritus Professor of Mathematics at MIT, and an Arts and Sciences Distinguished Scholar at the University of Miami. From 2000 to 2010, he was the Norman Levinson Professor of Applied Mathematics. He received his PhD at Harvard University in 1971 under the supervision of Gian-Carlo Rota. He is an expert in the field of combinatorics and its applications to other mathematical disciplines. Stanley is known for his two-volume book Enumerative Combinatorics (1986–1999). He is also the author of Combinatorics and Commutative Algebra (1983) and well over 200 research articles in mathematics. Donald Knuth named Stanley as one of his combinatorial heroes in a 2023 interview. His distinctions include membership in the National Academy of Sciences, the 2001 Leroy P. Steele Prize for Mathematical Exposition, the 2003 Schock Prize, a plenary lecture at the ICM, and election in 2012 as a fellow of the AMS. In 2022 he was awarded the Leroy P. Steele Prize for Lifetime Achievement.

Two analogues of Pascal's triangle

For integers $i, b \geq 2$ we define an infinite graded poset $P_{i,b}$ with a unique top element $\hat{1}$. For any $t \in P_{i,b}$ label t with the number of saturated chains from t to $\hat{1}$. These arrays of numbers have many interesting properties. Three cases are of particular interest:

- $(i, b) = (2, 2)$, where we obtain Pascal's triangle,
- $(i, b) = (3, 2)$, where we obtain a slight modification of Stern's diatomic array, and
- $(i, b) = (2, 3)$, where we obtain an array with many connections to Fibonacci numbers.

葉永南，温州大学数理学院特聘教授，主要研究方向是组合数学及其相关领域。葉永南教授于1985 年获得美国纽约州立大学水牛城分部博士学位，他的工作推广了 Chung–Feller 定理和波动理论的 Narayana 定理、Spitzer 定理等，多次获得中国台湾“中研院”杰出研究奖，中国台湾科技部门杰出特约研究员，中国台湾科技部门杰出研究奖，中国台湾科技部门杰出研究计划奖。组合图论国际顶级杂志 JCTA 曾出版专门文章介绍 Yeh-species, 这个由葉永南教授名字命名的领域，现在这一方向的研究仍然在不断深入。葉永南教授在国际 SCI 期刊发表论文 100 余篇，论文累计被引用 2900 余次 (Google Scholar)，最高单篇文章引用 300 余次，多篇文章引用超 100 余次，他曾多次应邀在重要的国际学术会议上作大会报告和举办重要国际会议，曾任多个国际学术期刊编委和多个国际重要期刊审稿人。

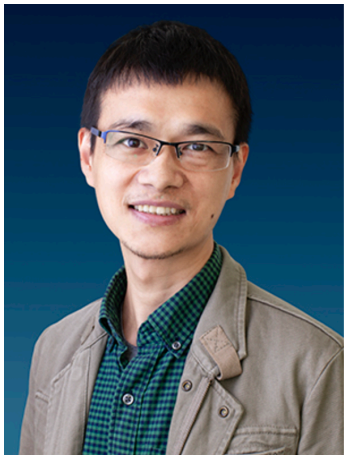
Eulerian-type polynomials and Stirling permutations

This presentation provides a comprehensive overview of recent developments in enumerative combinatorics, with a particular focus on the interplay between polynomial properties and combinatorial structures. The discussion will be approached from four perspectives: differential equations, differential operators, combinatorial models, and algebraic structures. We will delve into multivariate Eulerian polynomials, exploring their e-positivity, and extend this discussion to various enumerative polynomials linked to Stirling permutations, including ascent-plateau polynomials, left ascent-plateau polynomials, and flag ascent-plateau polynomials. Through the use of a specialized coding method, we uncover symmetries and equidistribution results among these polynomials. Furthermore, we demonstrate that many of these polynomials satisfy David–Barton-type identities, offering new insights into their structural and algebraic properties.

杨立波，南开大学组合数学中心教授，主要从事组合数学方面的研究，特别是在对称函数理论、单峰型理论、拟阵 Kazhdan–Lusztig 多项式理论等方面取得多项成果，解决了包括美国科学院院士 Stanley 提出的 zrank 猜想在内的多个公开问题。在 TAMS, IMRN, JCTA 等期刊接受发表 40 余篇论文。杨立波教授主持过多个国家自然科学基金项目，包括优秀青年基金和杰出青年基金项目。

Stanley's conjectures on distributive lattices

This talk is concerned with two conjectures of Professor Richard Stanley, one of which is on the real-rootedness of certain Eulerian polynomials associated to Stern's poset, and the other is on the nice property of distributive lattices. In this talk I will show how these two conjectures were solved. This is based on joint work with Dun Qiu, Grace Li, and Zhongxue Zhang.



陈绍示，中国科学院数学与系统科学研究院研究员。主要研究符号计算，计算微分代数与组合数学。2011 年中国科学院与法国巴黎综合理工学校联合培养博士毕业，曾先后在奥地利 Linz 大学符号计算研究所、美国北卡罗来纳州立大学、加拿大菲尔兹数学研究所与滑铁卢符号计算研究组从事博士后工作。在符号计算领域旗舰会议 ISSAC 发表论文 19 篇，以及 *Algebra and Number Theory*, *Journal of Symbolic Computation*，和 JCTA 等期刊发表论文 10 余篇。目前担任 *Annals of Combinatorics*, *Journal of Symbolic Computation*, *Journal of Difference Equations and Applications*, *Journal of Systems Science and Complexity* 和《系统科学与数学》等杂志编委。2019 年担任国际符号与代数计算年会 ISSAC 指导委员会常务委员，2021 年担任 ACM SIGSAM (ACM 符号与代数计算专业委员会) 秘书长与中国数学会计算机数学专业委员会秘书长。曾获得第二届“吴文俊计算机数学青年学者奖”(2019)，第 46 届国际符号与代数计算年会（ISSAC2021）“杰出论文奖”，与国际计算机代数应用大会（ACA2022）“青年学者奖”，入选中国科学院第七届“陈景润未来之星”人才计划和中国科学院青年创新促进会会员与优秀会员。

Patterns in multi-dimensional permutations

In this talk, we propose a general framework that extends the theory of permutation patterns to higher dimensions and unifies several combinatorial objects studied in the literature. This is a joint work with Hanqian Fang, Sergey Kitaev and Candice X. T. Zhang.

牟丽丽，江苏师范大学数学与统计学院副教授，研究方向为极值组合、代数组合、图论。大连理工大学和麻省理工学院（MIT）联合培养博士，伦敦大学学院（UCL）、MIT、德国马尔堡大学、中国台湾“中研院”访问学者。

Real rooted polynomials and f-polynomials of simplicial complexes

Bell and Skandera conjecture that the real rootedness of a Polynomial with positive integer coefficients implies that there is a simplicial complex Δ for which the coefficient is the number of i-dimensional faces of Δ, or in other word the polynomial is the f-polynomial of a simplicial complex Δ. We develop a new approach and collect further evidence for a positive answer to the question.

高奕博，北京大学北京国际数学研究中心助理教授，本科与博士毕业于麻省理工学院，导师为 Alex Postnikov 教授，研究领域为代数组合，主要研究方向包含 Schubert 计数演算和 Coxeter 群。

Interlacing triangles, Schubert puzzles, and graph colorings

Littlewood–Richardson coefficients encode tensor product multiplicities of the general linear group, and structure constants of the cohomology ring of the Grassmannian. There are many combinatorial models for the Littlewood–Richardson coefficients, with very rich structures. In this talk, we show that the interlacing triangular arrays, introduced by Aggarwal–Borodin–Wheeler in their study of certain probability measures related to LLT polynomials, can be used to compute Littlewood–Richardson coefficients. They are particularly well-suited to compute products of many Schur functions. This is joint work with Christian Gaetz.

郭龙，南开大学组合数学中心教授。研究方向是代数组合学，主要关注组合学与表示论、代数几何、离散几何相交叉的内容，工作集中在 Schubert 计数演算、对称函数、多面体、Kazhdan–Lusztig 理论等课题。与合作者解决了 ICM 邀请报告人 Igor Pak、András Némethi，数学顶刊 JAMS 前任副主编 Victor Reiner 以及现任副主编 Thomas Lam 等人提出的多个猜想和公开问题；在 ICM 邀请报告人 Gunter Ziegler 倡导研究的超立方子多面体的计数问题上取得实质进展。相关结果发表在 *Math. Z.*、*Science China Math.*、JCTA、*Discrete & Comput. Geom.* 等期刊，受到包括 Fields 奖得主、ICM 邀请报告人的关注和引用。

Zero-one characters of flagged Weyl modules

The flagged Weyl modules associated to diagrams in the plane are representations of the Borel subgroup of the general linear group. It is well known that the characters of flagged Weyl modules include as special cases two important families of polynomials in Algebraic Combinatorics: Schubert polynomials and key polynomials. In this talk, we shall give an overview of the construction of flagged Weyl modules as well as some combinatorial properties of their characters. Particularly, we prove a criterion of when the characters are zero-one (or, multiplicity-free), confirming a conjecture of Mészáros–St. Dizier–Tanjaya. This talk is mainly based on joint work with Zhuowei Lin and Simon Peng.