FPSAC 2022

34th International Conference on Formal Power Series and Algebraic Combinatorics

A satellite conference of ICM 2022

July 18-22, 2022
Indian Institute of Science,
Bangalore, India

INDIAN INSTITUTE OF SCIENCE
भारतीय विज्ञान संस्थान
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A word from the Organising Committee

On behalf of the Department of Mathematics at the Indian Institute of Science (IISc), I welcome you to the 34$^{\text{th}}$ Conference on *Formal Power Series and Algebraic Combinatorics*, FPSAC 2022. This year, FPSAC 2022 is a satellite conference of ICM 2022.

The Department of Mathematics at IISc is one of the most vibrant places in India for research in all areas of mathematics. In particular, we have several faculty working in combinatorics and allied areas.

This is the first time that FPSAC has been hosted in India, and I would like to thank everybody who has helped to make this event possible: the executive committee, the organising committee and the programme committee. The conference would not have been possible without support from staff in various departments at IISc. Last but not the least, I welcome the presenters and all participants. As the effects of the COVID-19 pandemic wear off, it is very important for us to get together to discuss mathematics. Your physical presence in FPSAC 2022 is very rewarding and is gratefully acknowledged. You are all contributing to ensure a vibrant and exciting conference.

We hope that you find the meeting both enjoyable and rewarding.

Arvind Ayyer
Chair, Organising Committee

Sponsors

FPSAC 2022 has been sponsored by the Indian Institute of Science (IISc), The Institute of Mathematical Sciences (IMSc), the International Mathematical Union (IMU), the National Science Foundation (NSF, USA), the National Board for Higher Mathematics (NBHM), the Science and Engineering Research Board (SERB, a division of the Department of Science and Technology (DST)) and the National Center for Mathematics (NCM). We gratefully acknowledge support from all of these organisations.

A word from the Program Committee

This year's conference received 136 submissions which is a testament to the health of our discipline, but also presented a considerable challenge for the 32 members of the program committee. We would like to take this opportunity to thank the committee for all of their hard work.

However, their task would have been far harder without the support of the wider community – since so many of you acted as secondary reviewers of submissions.

The conference would not have been possible without all your efforts. The program of 9 invited speakers, 27 contributed talks and 59 posters represents some of the best research taking place within the FPSAC community and at its interfaces with other fields. We are also very thankful we can meet again after the years of the pandemic.

Many thanks, *Ilse Fischer and Svante Linusson*
Programme Committee chairs

FPSAC 2022 Committees

Organising Committee

Arvind Ayyer (Chair): Indian Institute of Science, Bangalore
Gaurav Bhatnagar: Ashoka University, Delhi
Atul Dixit: Indian Institute of Technology, Gandhinagar
Gyula O. H. Katona: Hungarian Academy of Sciences
Madhusudan Manjunath: Indian Institute of Technology, Bombay
Narayanan N.: Indian Institute of Technology, Madras
K. N. Raghavan: The Institute of Mathematical Sciences, Chennai
Venkatesh Rajendran: Indian Institute of Science, Bangalore
Pooja Singla: Indian Institute of Technology, Kanpur
Sivaramakrishnan Sivasubramanian: Indian Institute of Technology, Bombay
Bridget Tenner (Executive Committee Liaison): DePaul University
S. Viswanath: The Institute of Mathematical Sciences, Chennai
Nathan Williams (NSF Funding Coordinator): University of Texas at Dallas
Travis Scrimshaw (Proceedings Editor): Osaka City University

Program Committee

Ilse Fischer (Co-chair): University of Vienna
Svante Linusson (Co-chair): KTH Royal Institute of Technology, Stockholm
Jean-Christophe Aval: CNRS, Université de Bordeaux
Andrew Berget: Western Washington University
Jérémie Bouttier: CEA, Université Paris-Saclay
Cesar Ceballos: TU Graz
Guilaume Chapuy: Université de Paris
Sunil Chhita: Durham University
Sylvie Corteel: University of California Berkeley and CNRS, Université de Paris
Rafael S. González D'León: Pontificia Universidad Javeriana
Basudeb Datta: Indian Institute of Science, Bangalore
Phillipe di Francesco: University of Illinois at Urbana-Champaign
Jehanne Dousse: Université Lyon 1
Mark Dukes: University College Dublin
Éric Fusy: CNRS, Université Gustave Eiffel
Jia Huang: University of Nebraska at Kearney

Matthieu Josuat-Vergés: CNRS, Université de Paris
Jang Soo Kim: Sungkyunkwan University
Christoph Koutschan: RICAM, Austria
Diane Maclagan: University of Warwick
Hannah Markwig: Universität Tübingen
Alejandro Morales: University of Massachusetts, Amherst
Philippe Nadeau: CNRS Université Lyon 1
Eran Nevo: Hebrew University
Soichi Okada: Nagoya University
Viviane Pons: Université Paris-Saclay
Amritanshu Prasad: The Institute of Mathematical Sciences, Chennai
Michael Schlosser: University of Vienna
Armin Straub: University of South Alabama
Vasu Tewari: University of Hawaii
Jiang Zeng: Université Lyon 1

Invited Speakers

Omer Angel
University of British Columbia

Omer Angel is a member of the Probability group at the University of British Columbia. His research interests include probability theory, random maps, percolations, random graphs, random walks, particle processes and scaling limits. He received his Ph.D. from the Weizmann Institute of Science under the supervision of Itai Benjamini and Oded Schramm. Subsequently, he has been a Post-doc at Orsay and at UBC. He spent two years as an assistant professor at the University of Toronto before returning to UBC, where he continues to stay.

Sen-Peng Eu
National Taiwan Normal University

Sen-Peng Eu is currently a Professor in the Department of Mathematics, National Taiwan Normal University. His research interests are algebraic combinatorics, enumerative combinatorics, algebraic graph theory and gifted education in Mathematics. He received his Ph.D. from National Taiwan Normal University under the supervision of Yeong-Nan Yeh and Mau-Hsiang Shih.

Apoorva Khare
Indian Institute of Science

Apoorva Khare is an Associate Professor of Mathematics in the Indian Institute of Science. He received his Ph.D. from the University of Chicago under Victor A. Ginzburg. After that, he held positions of Visiting Assistant Professor at University of California at Riverside, Lecturer at Yale and Research Associate at Stanford. He has been a Young Investigator of Infosys Foundation, a Ramanujan Fellow of SERB and a SwarnaJayanti Fellow of SERB and DST. He has also been elected as a Fellow of Indian Academy of Sciences, Bangalore in 2022. His research interests include Lie algebras and representation theory, algebraic combinatorics, matrix analysis, positivity, Schur polynomials, and probability.

Daniela Kühn
University of Birmingham

Daniela Kühn is the Mason Professor in Mathematics at the University of Birmingham, England. She is known for her research in combinatorics, particularly in extremal combinatorics and graph theory. She obtained her Ph.D. from the University of Hamburg under the guidance of Reinhard Diestel. Subsequently, she was postdoctoral researcher at the University of Hamburg and the Free University Berlin. She has received several honours and awards. She received the European prize in Combinatorics in 2003, the Whitehead Prize awarded by the London Mathematical Society in 2014, the Royal Society Wolfson Research Merit Award in 2015 and the Fulkerson prize, awarded jointly by the Mathematical Optimization Society and the American Mathematical Society in 2021.

Anton Mellit
University of Vienna

Anton Mellit is currently an Assistant Professor at the University of Vienna. He works on algebraic and enumerative geometry, and connections with representation theory, combinatorics and number theory. He obtained his Ph.D. at the University of Bonn under Don Zagier, following which he took up several postdoc positions in Bonn, Cologne, Trieste and Klosterneuburg before joining the Faculty of Mathematics at the University of Vienna.

Piotr Śniady
Polish Academy of Sciences

Piotr Śniady is currently a Professor at the Institute of Mathematics of Polish Academy of Sciences. His research interests include problems related to combinatorics, representation theory, and random matrix theory. He obtained his Ph.D. at the University of Wroclaw under Marek Bożejko before holding postdoctoral positions in IHES, ENS Paris, Syddansk Universitet (Denmark) and University of Warsaw. He has received several awards which include the award of Narodowe Centrum Nauki in 2015 and the award of Institute of Mathematics of Polish Academy of Sciences for outstanding mathematical research in 2017.

Hugh Thomas
Université du Québec à Montréal

Hugh Thomas is currently a Professor of Mathematics at Université du Québec à Montréal (UQAM). His areas of interest include algebraic combinatorics, representation theory of algebras and algebraic geometry. He obtained his Ph.D. from the University of Chicago under William Fulton. Subsequently he held postdoctoral positions at the University of Western Ontario and Fields Institute.

Rekha Thomas
University of Washington

Rekha Thomas is a mathematician and operations researcher. She is a Professor of mathematics at the University of Washington, and was the Robert R. and Elaine F. Phelps Professor there from 2008 until 2012. Her research interests include mathematical optimization and applied algebraic geometry. She earned a Ph.D. in operations research from Cornell University, supervised by Bernd Sturmfels. Prior to joining the University of Washington, she did her postdoctoral studies at Yale University and the Zuse Institute Berlin, and held a faculty position at Texas. She became one of the inaugural fellows of the American Mathematical Society in 2013.

Cynthia Vinzant
University of Washington

Cynthia Vinzant is an Assistant Professor in the Department of Mathematics at the University of Washington. She obtained her Ph.D. in Mathematics from UC Berkeley under the supervision of Bernd Sturmfels. Thereafter, she was a Hildebrandt Assistant Professor at the University of Michigan and a Research Fellow at Simons Insitute for the Theory of Computing before joining as an Assistant Professor in North Carolina State University, Raleigh, NC. Her research area is real algebraic geometry and its connections with several other fields, especially combinatorics and convex optimization.

Conference Schedule

All timings are in Indian Standard Time (IST = UTC + 5:30).

Playlist for the conference: on YouTube

Legend

- Registration and Welcome Address
- Food
- Coffee
- Online Invited Talk
- Offline Invited Talk
- Online Contributed Talk
- Offline Contributed Talk
- Poster Marathon
- Poster Session
- Session Chair
- Social Events

17th July

17:00 - 18:30	Pre-registration High Tea

18th July

7:30 - 8:45	Registration Breakfast
8:45 - 9:00	Welcome address

Session Chair: Svante Linusson

9:00 - 10:00	Omer Angel: Loop O(1) and even subgraphs as factors of IID
10:00 - 10:30	Alex McDonough: Rotor-Routing induces the only Planar Consistent Sandpile Torsor Algorithm Structure
10:30 - 11:00	Coffee
11:00 - 11:30	Dan Betea (online): Peaks of cylindric plane partitions
11:30 - 12:00	Swee Hong Chan (online): Log-concave poset inequalities
12:00 - 14:00	Lunch

Session Chair: K N Raghavan

14:00 - 15:00	Piotr Śniady (online): Museum of visual ART. Guided tour
15:00 - 15:30	Martin Rubey: Promotion of Krewaras words
15:30 - 16:00	Coffee
16:00 - 16:30	Yuval Roichman: Higher Lie characters and cyclic descent extension on conjugacy classes
16:30 - 17:00	Isaac Konan: Multigrounded partitions and character formulas
17:00 - 17:30	Poster Marathon 1
17:30 - 19:00	Poster Session 1

19th July

7:30 - 8:30	Breakfast

Session Chair: Pascal Weil

8:30 - 9:00	Tommy Hofmann (online, software demonstration): Computing Galois groups of Ehrhart Polynomials in OSCAR
9:00 - 10:00	Cynthia Vinzant: Log-concavity in matroids and expanders
10:00 - 10:30	Mohan Ravichandran: Rank Polynomials of Fence Posets are Unimodal
10:30 - 11:00	Coffee
11:00 - 11:30	Dennis Jahn (online): Bruhat intervals, subword complexes and brick polyhedra for finite Coxeter groups
11:30 - 12:00	Doriann Albertin: The canonical complex of the weak order
12:00 - 14:00	Lunch

Session Chair: Sheila Sundaram

14:00 - 15:00	Anton Mellit (online): Loehr-Warrington conjecture, shuffle conjectures and enumeration of p-tableaux
15:00 - 15:30	Benjamin Solomon: Soliton cellular automata for the affine general Linear Lie superalgebra
15:30 - 16:00	Coffee
16:00 - 16:30	Andrew Elvey Price (online): Enumeration of walks with small steps avoiding a quadrant
16:30 - 17:00	Grant Barkley: Biclosed sets in affine root systems
17:00 - 17:30	Poster Marathon 2
17:30 - 19:00	Poster Session 2

20th July

7:30 - 9:00	Breakfast

Session Chair: Tom Roby

9:00 - 10:00	Sen-Peng Eu (online): Signed statistics on permutations – from symmetric group to Coxeter groups
10:00 - 10:30	Sarah Brauner (online): A Type B Analog of the Whitehouse Representation
10:30 - 11:00	Coffee
11:00 - 11:30	Colin Defant (online): Semidistrim Lattices
11:30 - 12:00	Rebecca Patrias (online): A web basis of invariant polynomials from noncrossing partitions
12:00 - 12:30	Chris Bowman (online): Kronecker Products, Modular Representations, and Character Vanishing: results and conjectures of Christine Bessenrodt
12:00 - 14:00	Lunch

14:00 - 19:00	Excursion to Shravanabelagola

21st July

7:30 - 9:00	Breakfast

Session Chair: Christian Krattenhaler

9:00 - 10:00	Apoorva Khare: Equalities and inequalities involving Schur polynomials
10:00 - 10:30	Projesh Nath Choudhury: Blowup polynomials and delta-matroids of graphs
10:30 - 11:00	Coffee
11:00 - 11:30	Erkan Narmanli (online): Enumeration of corner polyhedra and 3-connected Schnyder labellings
11:30 - 12:00	Sophie Rehberg: Rational Ehrhart Theory
12:00 - 14:00	Lunch

Session Chair: Ekaterina Vassilieva

14:00 - 15:00	Daniela Kühn (online): Proof of the Erdos-Faber-Lovasz Conjecture
15:00 - 15:30	Fern Gossow: On the action of the long cycle on the Kazhdan-Lusztig basis
15:30 - 16:00	Coffee
16:00 - 16:30	Takafumi Kouno: Generalized quantun Yang-Baxter moves and its application to Schubert calculus
16:30 - 17:00	Houcine Ben Dali: Integrality in the Matching-Jack conjecture and the Farahat-Higman algebra
17:00 - 18:00	PP Divakaran: Pingala and the beginnings of combinatorics in India

19:00 - 22:00	Banquet

22nd July

7:30 - 9:00	Breakfast

Session Chair: Jang Soo Kim

9:00 - 10:00	Hugh Thomas: Combinatorics of scattering amplitudes
10:00 - 10:30	Patricia Klein (online): Bumpless pipe dreams encode Gröbner geometry of Schubert polynomials
10:30 - 11:00	Coffee
11:00 - 11:30	Sara Billey: A Pattern Avoidance Characterization for Smoothness of Positroid Varieties
11:30 - 12:00	Sean Griffin: Tournaments and slide rules for products of ψ and ω classes on $\overline{M}_{0,n}$
12:00 - 14:00	Lunch

Session Chair: Matjaz Konvalinka

14:00 - 15:00	Rekha Thomas (online): Graphical Designs
15:00 - 15:30	Andrés R. Vindas Meléndez: Triangulations, Order Polytopes, and Generalized Snake Posets
15:30 - 16:00	Coffee
16:00 - 16:30	Melissa Sherman-Bennett: The $m = 2$ amplituhedron and the hypersimplex
16:30 - 17:00	Eran Nevo: Vertex Spanning Planar Laman Graphs in Triangulated Surfaces

17:00 - 19:00	Walking tour of Malleshwaram

The list of posters is below. Presenters are marked with an asterisk.

Youtube link for Poster Marathon 1: https://youtu.be/PRoKxYDdk6U

Poster Session 1

1. Refined consecutive pattern enumeration via a generalized cluster method – Yan Zhuang*
2. Mockingbird lattices – Samuele Giraudo*
3. Continuously Increasing Subsequences of Random Multiset Permutations – Alexander Clifton, Bishal Deb*, Yifeng Huang, Sam Spiro and Semin Yoo
4. Row-strict dual immaculate functions and 0-Hecke modules – Elizabeth Niese, Sheila Sundaram*, Stephanie van Willigenburg, Julianne Vega and Shiyun Wang
5. Homomorphism complexes, reconfiguration, and homotopy for directed graphs – Anton Dochtermann and Anurag Singh*
6. Walks in simplices, cylindric tableaux, and asymmetric exclusion processes – Sergi Elizalde*
7. Stable sets in flag spheres – Maria Chudnovsky and Eran Nevo*
8. An involution on derangements preserving excedances and right-to-left minima – Per Wilhelm Alexandersson and Frether Getachew Kebede*
9. Peaks are Preserved under Run-Sorting – Per Alexandersson and Olivia Nabawanda*
10. Troupes, Cumulants, and Stack-Sorting – Colin Defant*
11. Equidistributions around special kinds of descents and excedances via continued fractions – Bin Han*, Jianxi Mao and Jiang Zeng
12. Combinatorics of Newell-Littlewood numbers – Shiliang Gao, Gidon Orelowitz*, Nicolas Ressayre and Alexander Yong
13. Wronskians, total positivity, and real Schubert calculus – Steven Karp*
14. Parity biases in partitions and restricted partitions – Koustav Banerjee, Sreerupa Bhatttacharjee, Manosij Ghosh Dastidar, Pankaj Jyoti Mahanta* and Manjil Saikia
15. Set partitions, fermions, and skein relations – Jesse Kim* and Brendon Rhoades
16. A statistic for regions of braid deformations – Priyavrat Deshpande* and Krishna Menon

17. Weighted Ehrhart series and a type-B analogue of a formula of MacMahon – Elena Tielker*

18. Flag Hilbert–Poincaré series and Igusa zeta functions of hyperplane arrangements – Joshua Maglione* and Christopher Vol

19. Inequality of a class of near-ribbon skew Schur Q functions – Maria Gillespie and Kyle Salois*

20. Classifying Levi-spherical Schubert varieties – Yibo Gao, Reuven Hodges* and Alexander Yong

21. Asymptotics of coefficients of algebraic series via embedding into rational series (extended abstract) – Torin Greenwood*, Stephen Melczer, Tiadora Ruza and Mark C. Wilson

22. Friezes for a Pair of Pants – Ilke Canakci, Anna Felikson, Ana Garcia Elsener* and Pavel Tumarkin

23. Affine semigroups of maximal projective dimension – Om Prakash Bhardwaj*, Kriti Goel and Indranath Sengupta

24. A combinatorial model for the transition matrix between the Specht and web bases – Jihyeug Jang*, Byung-Hak Hwang and Jaeseong Oh

25. Set Partitions, Tableaux, and Subspace Profiles of Regular Diagonal Operators – Amritanshu Prasad and Samrith Ram*

26. 0-Hecke-Clifford modules from diagrams – Dominic Searles*

27. Factorization of classical characters twisted by roots of unity: extended abstract – Arvind Ayyer and Nishu Kumari*

28. Rowmotion on fences – Sergi Elizalde, Matthew Plante, Tom Roby* and Bruce Sagan

29. Positive Tropical Flags and the Positive Tropical Dressian – Jonathan Boretsky*

Youtube link for Poster Marathon 2: https://youtu.be/Vxxmdu2a1YI

Poster Session 2

1. Planar Tanglegram Layouts and Single Edge Insertion – Kevin Liu*
2. Grothendieck-to-Lascoux expansions – Tianyi Yu* and Mark Shimozono
3. Castelnuovo-Mumford Regularity of Matrix Schubert Varieties – Oliver Pechenik, David E. Speyer and Anna Weigandt*
4. New companions to Gordon identities from commutative algebra – Pooneh Afsharijoo*, Jehanne Dousse, Frédéric Jouhet and Hussein Mourtada
5. A description of the minimal elements of Shi regions in classical Weyl Groups – Balthazar Charles*
6. Rooted Clusters for Graph LP Algebras – Esther Banaian, Sunita Chepuri, Elizabeth Kelley* and Sylvester W. Zhang
7. Subdivisions of generalized permutahedra – Jorge Olarte*, Michael Joswig, Georg Loho and Dante Luber
8. Horizontal-strip LLT polynomials – Foster Tom*
9. Chromatic Quasisymmetric Class Functions of linearized combinatorial Hopf monoids – Jacob White*
10. Harmonic Polynomials on Perfect Matchings – Yuval Filmus and Nathan Lindzey*
11. Crystals and integrable systems for edge labeled tableaux – Ajeeth Gunna* and Travis Scrimshaw
12. Parabolic Tamari Lattices in Linear Type B – Wenjie Fang, Henri Mühle* and Jean-Christophe Novelli
13. Shuffle Lattices and Bubble Lattices – Thomas McConville* and Henri Mühle
14. Multiplication theorems for self-conjugate partitions – David Wahiche*
15. The monopole-dimer model for Cartesian products of graphs: extended abstract – Anita Arora* and Arvind Ayyer
16. Weak faces and a formula for weights of highest weight modules, via parabolic partial sum property for roots – G Krishna Teja*
17. Acyclic reorientation lattices and their lattice quotients – Vincent Pilaud*

18. On the geometry of flag Hilbert–Poincaré series for matroids – Lukas Kühne* and Joshua Maglione

19. Highest weight crystals for Schur Q-functions – Eric Marberg and Kam Hung Tong*

20. The elliptic Hall algebra element $\mathbf{Q}^k_{m,n}(1)$ – Andy Wilson*

21. Cluster Duality for Lagrangian and Orthogonal Grassmannians – Charles Wang*

22. Deformation cones of hypergraphic polytopes – Arnau Padrol, Vincent Pilaud and Germain Poullot*

23. Cyclic Actions in Parking Spaces – Eric Nathan Stucky*

24. Lattice paths and negatively indexed weight-dependent binomial coefficients – Josef Küstner, Michael Schlosser* and Meesue Yoo

25. A q-deformation of enriched P-partitions – Darij Grinberg* and Ekaterina Vassilieva

26. Growth of unbounded sets in nilpotent groups and random mapping statistics – Beeri Greenfeld and Hagai Lavner*

27. Derangements and the p-adic incomplete gamma function – Andrew O'Desky and Harry Richman*

28. Product-Coproduct Prographs and Triangulations of the Sphere – Nicolas Borie* and Justine Falque

29. Combinatorics of fighting fish, planar maps and Tamari intervals – Corentin Henriet* and Enrica Duchi

30. Torsors from toggling independent sets – Colin Defant, Michael Joseph, Matthew Macauley and Alex McDonough*

Campus Map and Conference Venues

Campus E- Rickshaw Services

Free E- Rickshaw services are available on campus throughout the day. There are 5 colour-coded routes with 2 E-rickshaws per route. Every 15-20 minutes, an E-rickshaw is available from the start/end points of a route.

E-Rickshaw Timings -

8:00 am - 10:00 am

Break 1: 10:00 am - 10:30 am

10:30 am - 11:30 am

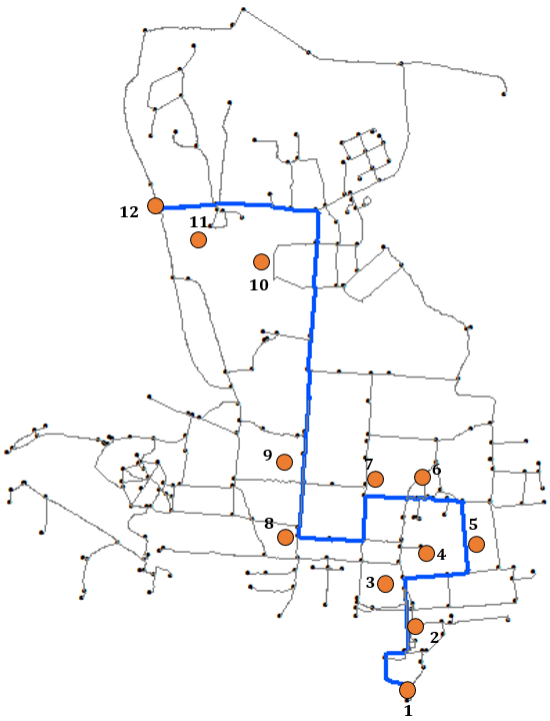
Break 2: 11:30 am - 12:15 pm

12:15 pm - 4:15 pm

Break 3: 4:15 pm - 4:45 pm

4:45 pm - 6:25 pm

E-Rickshaw Routes -

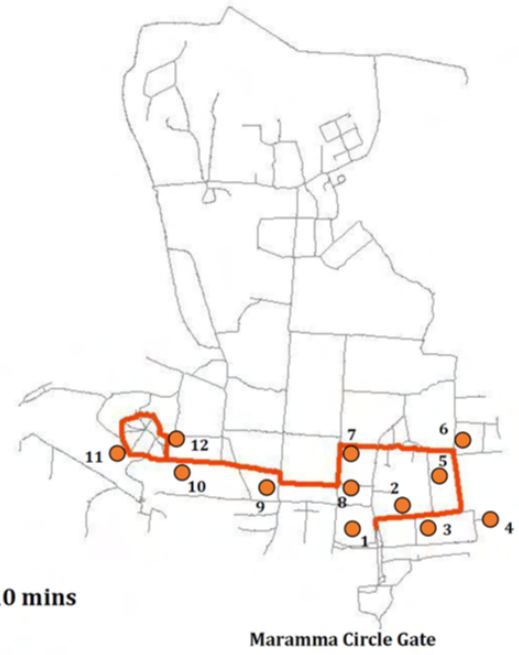


BLUE LINE

1. **Maramma circle Gate**
2. **Satish Dhawan Auditorium**
3. **Prakruthi Restaurant (Now IDC)**
4. **Civil Engg. Dept.**
5. **SERC Dept.**
6. **Molecular Biophysics Units**
7. **BSNL office**
8. **Library**
9. **Student Council Office**
10. **ECE Dept.**
11. **Biological Sciences building**
12. **D Gate**

- **Route Length – 2.7 km**
- **Frequency of trip (approx.) – 15 mins**

For Main Building deboard at Library.

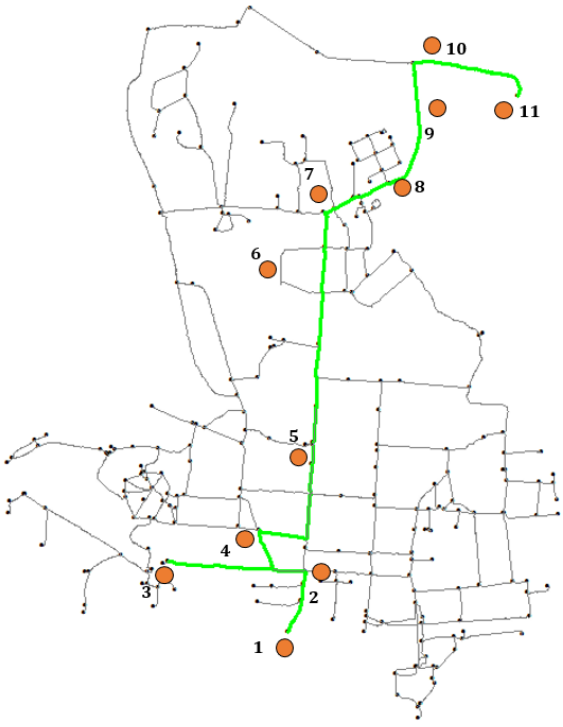


ORANGE LINE

1. Prakruthi Underpass
2. Civil Department
3. CSA Department
4. Mechanical Dept.
5. SERC Department
6. CGPL Department
7. IPC Department
8. Old Biochemistry Building.
9. Library
10. New Hostels Complex
11. N Block
12. Ashwini Hostel

- **Route Length – 2 km**
- **Frequency of trip (approx.) – Once every 10 mins**

For Department of Mathematics deboard at IPC Department.



GREEN LINE

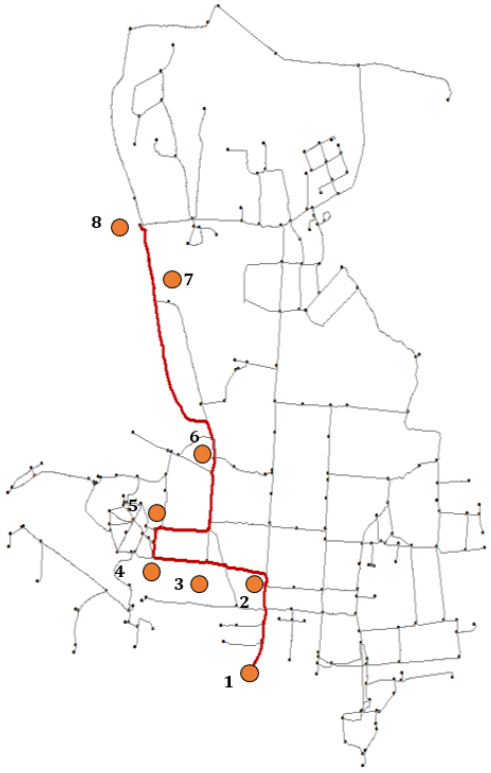
1. Main Gate
2. Library
3. Health Center
4. Hotel Nesara
5. Student Council Office
6. ECE Department
7. Super Bazar
8. Housing Colony
9. HE Faculty Quater
10. Centenary Visitor House
11. Ramaiah Gate

- **Route Length – 2.8 km**
- **Frequency of trip (approx.) – 13 mins**

PURPLE LINE

1. ATM Gate
2. BSNL Exchange
3. Main Guest House
4. JNC Guest House
5. ECE Dept.
6. Super Bazaar
7. HE Faculty Quarters
8. Ramaiah Gate

- Route Length – 2.17 km
- Frequency of trip (approx.) – Once every 12 mins



RED LINE

1. Main Gate
2. Library
3. Nesara Restaurant
4. New Hostels
5. Rohini
6. Faculty Club
7. Biological Science Building
8. D – Gate

- Route Length – 1.76 km
- Frequency of trip (approx.) – 12 min

Gallery

Figure 1: IISc Main Building

Figure 2: IISc Main Building Faculty hall and Foyer

Figure 3: Department of Mathematics with FPSAC'22 banner

Abstracts of Invited Talks

Omer Angel – Loop O(1) and even subgraphs as factors of IID

For a finite graph, it is easy to select uniformly an even subgraph: one where all degrees are even. For infinite graphs there are multiple natural distributions for a "uniform" even subgraph. We wish to select a subgraph locally, where the inclusion of each edge is determined from randomness associated to the edge, in communication with nearby edges but with no global coordination. I will discuss settings in which this can and cannot be achieved, and the motivation from statistical physics where even subgraphs are used to relate the Loop O(1) model to the FK–Ising model. Joint work with Gourab Ray and Yinon Spinka.

Piotr Śniady – Museum of visual ART. Guided tour

Museum of visual ART (Asymptotic Representation Theory) collects mathematical artifacts which can be visualized as beautiful images or animations related to large random combinatorial objects related to the representation theory. Our visit to the Museum will consist of two parts, focused around two exhibits. Slides, animations, homeworks, references and additional materials are available at psniady.impan.pl/fpsac.

Cynthia Vinzant – Log-concavity in matroids and expanders

Log-concavity is an important feature of many functions and discrete sequences appearing across mathematics, including combinatorics, algebraic geometry, convex analysis, and optimization. In this talk, I will discuss recent advances in our understanding of the real and combinatorial geometry underlying multivariate polynomials that are log-concave on the positive orthant. These real functions are closely related to matroids and can be used to understand the behavior of large random walks on associated simplicial complexes. This is based on joint work with Nima Anari, Kuikui Liu, Shayan Oveis Gharan and Thuy Duong Vuong.

Anton Mellit – Warrington conjecture, shuffle conjectures and enumeration of p-tableaux

In q,t-mathematics a major object of interest is the nabla operator. This operator is applied to various symmetric functions and we are interested in explicit combinatorial expansions of the results. Several such expansions have been established: the compositional shuffle conjecture evaluates nabla applied to the modified Hall-Littlewood polynomials, the Loehr-Warrington conjecture evaluates nabla applied to the Schur polynomials, and the result of the application of nabla to products of modified compete homogeneous functions was established in a recent paper by Erik Carlsson and myself. In the talk I will present a

unifying approach based on p-tableaux enumeration, inspired by the work of Shareshian and Wachs, that in particular implies that the three statements are equivalent. Based on joint work with Erik Carlsson.

Sen-Peng Eu – Signed statistics on permutations – from symmetric group to Coxeter groups

The symmetric group, or the set of permutations, can be seen as the Coxeter group of type A or the complex reflection group $G(r, 1, n)$. Since there are permutation models for Coxeter groups of types B, D (signed permutations) and $G(r, 1, n)$ (colored permutations), it is natural and an old paradigm to generalize results on permutations to these groups. In this talk we present some recent results along this route, focusing on the signed statistics. The highlights include the following: signed identities around Euler and Springer numbers, Simsun permutations of various types, signed Mahonian and signed Euler–Mahonian identities, and signed identities with word restrictions. Some new ideas will also be mentioned if time permits.

Apoorva Khare – Equalities and inequalities involving Schur polynomials

We present recent results involving Schur polynomials, viewed both as algebraic objects and as functions on the positive orthant. First, we explain why all Schur polynomials are lurking within every smooth function, by extending a 1960s determinantal computation of Loewner. This extends 1800s determinantal identities by Cauchy and Frobenius for geometric series, to all power series, over all unital commutative rings.

Second, we explain a recent characterization of weak majorization – and of majorization for real tuples – joint with Tao, and involving Schur polynomials. The latter extends work of Cuttler–Greene–Skandera and Sra, and is an example of majorization inequalities – which have been studied since Maclaurin and Newton in the 1700s, and were recently extended by McSwiggen–Novak to all Weyl groups.

Daniela Kühn – Proof of the Erdős–Faber–Lovász conjecture

The Erdős–Faber–Lovász conjecture (posed in 1972) states that the chromatic index of any linear hypergraph on n vertices is at most n. (Here the chromatic index of a hypergraph H is the smallest number of colours needed to colour the edges of H so that any two edges that share a vertex have different colours.) Erdős considered this to be one of his three most favorite combinatorial problems and offered $500 for the solution of the problem.
In a joint work with Dong-Yeap Kang, Tom Kelly, Abhishek Methuku and Deryk Osthus, we prove this conjecture for every large n. We also provide "stability versions" of this result, which confirm a prediction of Kahn.
In my talk, I will discuss some background, some of the ideas behind the proof, as well as some related open problems.

Hugh Thomas – Combinatorics of scattering amplitudes

Rekha Thomas – Graphical Designs

A graphical design is a subset of graph vertices such that the weighted averages of specified graph eigenvectors over the design agree with their global averages. We use Gale duality to show that positively weighted graphical designs in regular graphs are in bijection with the faces of a generalized eigenpolytope of the graph. This connection can be used to organize, compute and optimize designs. In this talk I will explain this tool and illustrate its power on three families of Cayley graphs.

Abstracts of Contributed Talks

Alex McDonough – Rotor-Routing Induces the Only Consistent Sandpile Torsor Structure on Plane Graphs

Every finite graph has an associated sandpile group, which can be described in terms of chip-firing. A sandpile torsor algorithm is a map which associates each plane graph (i.e. planar embedding) with a free transitive action of its sandpile group on its spanning trees. We define a notion of consistency, which requires a torsor algorithm to be preserved with respect to a certain class of contractions and deletions. We then show that the rotor-routing sandpile torsor algorithm (which is equivalent to the Bernardi algorithm) is consistent. Furthermore, we demonstrate that there are only three other consistent algorithms, which all have the same structure as rotor-routing. This proves a conjecture of Klivans. Joint work with Ankan Ganguly.

Dan Betea – Peaks of cylindric plane partitions

We study the asymptotic distribution, as the volume parameter goes to 1, of the peak (largest part) of finite- or slowly-growing-width cylindric plane partitions weighted by their trace, seam, and volume. There are two natural asymptotic regimes depending on the trace/seam parameters, and in both cases we obtain asymptotics governed by finite temperature (periodic) analogues of the Bessel and Airy gap probabilities from random matrix theory. In particular, the distributions we obtain interpolate in more than one way between two well-known extremal value distributions: the Gumbel distribution of maxima of iid random variables and the Tracy–Widom distribution of maxima of eigenvalues of random Hermitian matrices. We also interpret our results in terms of last passage percolation on a cylinder, which yields to interesting connections to the Kardar–Parisi–Zhang equation.

Swee Hong Chan – Combinatorial atlas for log-concave inequalities

The study of log-concave inequalities for combinatorial objects have seen much progress in recent years. One such progress is the solution to the strongest form of Mason's conjecture (independently by Anari et. al. and Brändën-Huh). In the case of graphs, this says that the sequence f_k of the number of forests of the graph with k edges, form an ultra log-concave sequence. In this talk, we discuss an improved version of all these results, proved by using a new tool called the combinatorial atlas method.

Sarah Brauner – A Type B analog of the Whitehouse representation

The Eulerian idempotents of the symmetric group $\mathfrak{S}_n$ generate a family of representations called the Eulerian representations, which have connections to configuration spaces, equivariant cohomology, and Solomon's descent algebra. These representations are defined in terms of $\mathfrak{S}_n$, but can be "lifted" to representations of $\mathfrak{S}_{n+1}$ called the Whitehouse representations. I will describe this story in detail and present recent work generalizing it to the hyperoctahedral group (e.g. Type B). In this setting, configuration spaces will be replaced by certain orbit configuration spaces and Solomon's descent algebra is replaced by the Mantaci–Reutenauer algebra. All of the above will be defined in the talk.

Yuval Roichman – Higher Lie characters and cyclic descent extension on conjugacy classes

A now-classical cyclic extension of the descent set of a permutation has been introduced by Klyachko and Cellini. Following a recent axiomatic approach to this notion, it is natural to ask which sets of permutations admit such a (not necessarily classical) extension. The main result of this paper is a complete answer in the case of conjugacy classes of permutations. It is shown that the conjugacy class of cycle type λ has such an extension if and only if λ is not of the form (r^s) for some square-free r. The proof involves a detailed study of hook constituents in higher Lie characters.

Isaac Konan – Multigrounded-partitions and character formulas

We introduce a new generalisation of partitions, multi-grounded partitions, related to ground state paths indexed by dominant weights of Lie algebras. We use these to express characters of irreducible highest weight modules of Kac–Moody algebras of affine type as generating functions for multi-grounded partitions, and obtain new non-specialised character formulas.

Mohan Ravichandran – Rank Polynomials of Fence Posets are Unimodal

We prove a conjecture of Morier-Genoud and Ovsienko that says that rank polynomials of the distributive lattices of lower ideals of fence posets are unimodal. We do this by introducing a related class of circular fence posets and proving a stronger version of the conjecture due to McConville, Sagan and Smyth. We show that the rank polynomials of circular fence posets are symmetric and conjecture that unimodality holds except in some particular cases. We also apply the recent work of Elizalde, Plante, Roby and Sagan on rowmotion on fences and show many of their homomesy results hold for the circular case as well.

Dennis Jahn – Bruhat intervals, subword complexes and brick polyhedra for finite Coxeter groups

We study the interplay between the discrete geometry of Bruhat poset intervals and subword complexes of finite Coxeter systems. We establish connections between the cones generated by cover labels for Bruhat intervals and of root configurations for subword complexes, culminating in the notion of brick polyhedra for general subword complexes.

Doriann Albertin – The canonical complex of the weak order

The **canonical join complex** of a join-semidistributive lattice L is a simplicial complex whose faces are in bijection with the elements of L and record the canonical join representations in L. We introduce the **canonical complex** of a semidistributive lattice L, another simplicial complex containing both the canonical join and meet complexes, and whose faces are in bijection with intervals of L. Like the canonical join complex, the canonical complex is flag, and behaves well with quotients of L. In 2015, N. Reading introduced the **non-crossing complex**, a combinatorial model for the canonical join complex of the **right weak order** on permutations. Its faces are described with **non-crossing arc diagrams**. We focus in this talk on the example of the weak order, and extend this combinatorial model to a description of the canonical complex of the weak order, the **semi-crossing complex**, and its faces, the **semi-crossing arc bidiagrams**. This allows us to compute a generalization of the Kreweras complement on non-crossing partitions to all quotients of the weak order.

Benjamin Solomon – Soliton cellular automata for the affine general linear Lie superalgebra

The box-ball system (BBS) is a cellular automaton that is an ultradiscrete analogue of the Korteweg–de Vries equation, a non-linear PDE used to model water waves. The BBS has been generalised to the general linear Lie superalgebra $\mathfrak{gl}(m|n)$. We further generalise this BBS using the Kirillov–Reshetikhin crystals for $\widehat{\mathfrak{gl}}(m|n)$, where we find solitonic behaviour under certain conditions.

Andrew Elvey Price – Enumeration of walks with small steps avoiding a quadrant

We address the enumeration of walks with weighted small steps avoiding a quadrant. In particular we give an exact, integral-expression solution for the generating function $\mathsf{C}(x, y; t)$ counting these walks by length and end-point. Moreover, we determine precisely when this generating function is algebraic, D-finite or D-algebraic with respect to x, showing that this complexity is the same as for walks in the quarter-plane with the same starting point, as long as the starting point (p, q) of the walks lies in the quarter plane then. Finally, we give an integral-free expression for the solution in the cases where (p, q) lies just outside the quarter plane, that is $p = 0$ or $q = 0$ with our convention, proving a conjecture of Raschel and Trotignon.

Grant Barkley – Biclosed sets in affine root systems

A biclosed set is a collection of positive real roots in a root system, satisfying some closure properties. The poset of all biclosed sets in a given root system under containment order is called the extended weak order. It turns out to depend only on the underlying Coxeter system (W, S). When W is finite, extended weak order coincides with the weak Bruhat order on W. When W is infinite, the extended weak order strictly contains the usual weak order. This extension of the weak order adds desirable objects such as the infinite reduced words in W and many other elements arising from the geometry of W. It is well-known

that the usual weak order on an infinite Coxeter group fails to have least upper bounds. In contrast, it is a longstanding conjecture of Matthew Dyer that the extended weak order is a lattice for any Coxeter group. We will discuss these ideas in the case of an affine root system. Our main result is a proof of Dyer's conjecture for the affine Coxeter groups.

Martin Rubey –Promotion of Kreweras words

Kreweras words are words consisting of n A's, n B's, and n C's in which every prefix has at least as many A's as B's and at least as many A's as C's. Equivalently, a Kreweras word is a linear extension of the poset $V \times [n]$. Kreweras words were introduced in 1965 by Kreweras, who gave a remarkable product formula for their enumeration. Subsequently they became a fundamental example in the theory of lattice walks in the quarter plane. We study Schützenberger's promotion operator on the set of Kreweras words. In particular, we show that $3n$ applications of promotion on a Kreweras word merely swaps the B's and C's. Doing so, we provide the first answer to a question of Stanley from 2009, asking for posets with 'good' behavior under promotion, other than the four families of shapes classified by Haiman in 1992. We also uncover a strikingly simple description of Kreweras words in terms of Kuperberg's sl_3-webs, and Postnikov's trip permutation associated with any plabic graph. In this description, Schützenberger's promotion corresponds to rotation of the web.

Colin Defant – Semidistrim Lattices

We introduce *semidistrim lattices*, a simultaneous generalization of semidistributive and trim lattices that preserves many of their common properties. We prove that the elements of a semidistrim lattice correspond to the independent sets in an associated graph called the *Galois graph*, that products and intervals of semidistrim lattices are semidistrim, and that the order complex of a semidistrim lattice is either contractible or homotopy equivalent to a sphere. Semidistrim lattices have a natural *rowmotion* operator, which simultaneously generalizes Barnard's $\overline{\kappa}$ map on semidistributive lattices as well as the definition of rowmotion that Thomas and Williams gave for trim lattices. Every lattice has an associated *pop-stack sorting operator* that sends an element x to the meet of the elements covered by x. For semidistrim lattices, we are able to derive several intimate connections between rowmotion and pop-stack sorting, one of which involves independent dominating sets of the Galois graph. This talk is based on joint work with Nathan Williams.

Rebecca Patrias – A web basis of invariant polynomials from noncrossing partitions

In the special cases where $\lambda = (k, k)$ or $\lambda = (k, k, k)$, the Specht module S^λ has a useful web basis. Building on work of B. Rhoades, we construct an apparent web basis of invariant polynomials for Specht modules of the form $S^{(k,k,1^\ell)}$. The webs in this case are noncrossing set partitions. This is joint work with Oliver Pechenik and Jessica Striker.

Projesh Nath Choudhury – Blowup-polynomials and delta-matroids of graphs

Given a finite simple connected graph $G = (V, E)$, we introduce a novel invariant which we call its blowup-polynomial $p_G(n_v : v \in V)$. To do so, we compute the determinant of the distance matrix of the graph blowup, obtained by taking n_v copies of the vertex v, and removing an exponential factor. First: we show that as a function of the sizes n_v, p_G is a polynomial, is multi-affine, and is real-stable. Second: we show that the multivariate polynomial p_G fully recovers G whereas the characteristic polynomial of the distance matrix does not. Third: we obtain a novel characterization of the complete multi-partite graphs, as precisely those whose "homogenized" blowup-polynomials are Lorentzian/strongly Rayleigh. Finally: we show how to obtain from p_G a novel delta-matroid for every graph; we also provide a second, combinatorial delta-matroid for every tree, which too is hitherto unexplored and whose construction does not extend to all graphs. (Joint with Apoorva Khare.)

Erkan Narmanli – Enumeration of corner polyhedra and 3-connected Schnyder labelings

We show that planar posets (plane bipolar orientations without transitive edges) and transversal structures can be mapped to certain (weighted) walks in the quarter plane, using specializations of a bijection due to Kenyon, Miller, Sheffield, and Wilson (2019). We derive asymptotic enumeration results for these two models, using the results of Bostan, Raschel and Salvy on the asymptotic counting of of random walks in a cone (2014). In particular we obtain the asymptotic equivalent for transversal structures with $n + 4$ vertices: $t_n \sim \varkappa(27/2)^n n^{-1-\pi/\arccos(7/8)}$, which assures us that the associated generating series is not D-finite.

We also show a bijection between the plane posets with $n+2$ vertices and permutations of size n that avoid the barred pattern: $2\,\underline{14}\,3$.

Sophie Rehberg – Rational Ehrhart Theory

The Ehrhart quasipolynomial of a rational polytope P encodes fundamental arithmetic data of P, namely, the number of integer lattice points in positive integral dilates of P. Ehrhart quasipolynomials were introduced in the 1960s, satisfy several fundamental structural results and have applications in many areas of mathematics and beyond. The enumerative theory of lattice points in rational (equivalently, real) dilates of rational polytopes is much younger, starting with work by Linke (2011), Baldoni–Berline–Köppe–Vergne (2013), and Stapledon (2017). We introduce a generating-function *ansatz* for rational Ehrhart quasipolynomials, which unifies several known results in classical and rational Ehrhart theory. In particular, we define γ-rational Gorenstein polytopes, which extend the classical notion to the rational setting and encompass the generalized reflexive polytopes studied by Fiset–Kasprzyk (2008) and Kasprzyk–Nill (2012). This is joint work with Matthias Beck and Sophia Elia.

Fern Gossow – Acting by Separable Permutations on the Kazhdan–Lusztig Basis

Fix an arbitrary partition and its associated Specht module. This module comes equipped with an important basis, known as the Kazhdan–Lusztig (KL) basis. This basis enjoys many wonderful properties, but the action of arbitrary elements are difficult to compute in general.

We prove that every separable permutation acts on the KL basis by a signed bijection up to strictly lower order terms in some naturally-defined order. This generalises the well-known action of the long element by evacuation (Stembridge, Berenstein–Zelevinksy) for all partitions and the action of the long cycle by promotion (Rhoades) when the partition is rectangular. To achieve this, we determine a Jordan–Hölder filtration for the restriction of the Specht module to an arbitrary standard parabolic subgroup, such that each piece is spanned by a subset of the KL basis. This gives new insight into the classical theory of branching rules and Littlewood–Richardson coefficients.

Takafumi Kouno – Generalized quantum Yang–Baxter moves and its application to Schubert calculus

The quantum alcove model is a uniform combinatorial model in the representation theory of quantum affine algebras and Schubert calculus on flag manifolds. Given a weight λ, the model is based on a sequence of roots called a λ-chain. When λ is dominant, the independence of the model from the chosen λ-chain was shown using certain elementary transformations called quantum Yang–Baxter moves. The purpose of the present work is to generalize the quantum Yang–Baxter moves to an arbitrary weight λ. As an application, we give a combinatorial proof of the Chevalley formula in the equivariant K-group of semi-infinite flag manifolds, first proved by Lenart–Naito–Sagaki.

Houcine Ben Dali – Integrality in the Matching-Jack conjecture and the Farahat-Higman algebra

Using Jack polynomials, Goulden and Jackson have introduced a one parameter deformation τ_b of the generating series of bipartite maps. The Matching-Jack conjecture suggests that the coefficients $c^{\lambda}_{\mu,\nu}$ of the function τ_b in the power-sum basis are non-negative integer polynomials in the deformation parameter b. Dołęga and Féray have proved in 2016 the "polynomiality" part in the Matching-Jack conjecture. In this paper, we prove the "integrality" part. The proof is based on a recent work of the author that deduces the Matching-Jack conjecture for marginal sums $c^{\lambda}_{\mu,l}$ from an analog result for the b-conjecture, established in 2020 by Chapuy and Dołęga. A key step in the proof involves a new connection with the graded Farahat-Higman algebra.

Patricia Klein – Bumpless pipe dreams encode Gröbner geometry of Schubert polynomials

Knutson and Miller established a connection between the anti-diagonal Gröbner degenerations of matrix Schubert varieties and the pre-existing combinatorics of pipe dreams. They used this correspondence to give a geometrically-natural explanation for the appearance

of the combinatorially-defined Schubert polynomials as representatives of Schubert classes. In this talk, we will describe a similar connection between diagonal degenerations of matrix Schubert varieties and bumpless pipe dreams, newer combinatorial objects introduced by Lam, Lee, and Shimozono. This connection was conjectured by Hamaker, Pechenik, and Weigandt. This talk is based on joint work with Anna Weigandt.

Sara Billey – A Pattern Avoidance Characterization for Smoothness of Positroid Varieties

Positroids are certain representable matroids originally studied by Postnikov in connection with the totally nonnegative Grassmannian and now used widely in algebraic combinatorics. The positroids give rise to determinantal equations defining positroid varieties as subvarieties of the Grassmannian variety. Rietsch, Knutson–Lam–Speyer, and Pawlowski studied geometric and cohomological properties of these varieties. In this paper, we continue the study of the geometric properties of positroid varieties by establishing several equivalent conditions characterizing smooth positroid varieties using a variation of pattern avoidance defined on decorated permutations, which are in bijection with positroids. This allows us to give two formulas for counting the number of smooth positroids along with two q-analogs. Furthermore, we give a combinatorial method for determining the dimension of the tangent space of a positroid variety at key points using an induced subgraph of the Johnson graph. We also give a Bruhat interval characterization of positroids.

Sean Griffin – Tournaments and slide rules for products of ψ and ω classes on $\overline{M}_{0,n}$

In 2019, Cavalieri, Gillespie and Monin introduced the asymmetric multinomial coefficients, defined by a simple recursion called the asymmetric string equation. These coefficients arise as the degree 0 products of ω classes on the moduli space $\overline{M}_{0,n}$, and they gave a combinatorial description in terms of parking functions.

In this talk, we give two more combinatorial descriptions of asymmetric multinomial coefficients in terms of trivalent trees (boundary points on $\overline{M}_{0,n}$). The first is obtained by a combinatorial algorithm called a *lazy tournament* and the second by *slides*. We use lazy tournaments to give a simple proof that the total degree of $\overline{M}_{0,n+3}$ in the iterated Kapranov embedding is $(2n-1)!!$. Furthermore, we use slides to express products of ω and ψ classes in all dimensions as positive, multiplicity-free sums of boundary strata. We show that these strata can moreover be obtained as limits of complete intersections of $\overline{M}_{0,n}$ with explicitly-defined families of hyperplanes.

This is joint work with Maria Gillespie and Jake Levinson.

Andrés R. Vindas-Meléndez – Triangulations, Order Polytopes, and Generalized Snake Posets

This work regards the order polytopes arising from the class of generalized snake posets and their posets of meet-irreducible elements.
Among generalized snake posets of the same rank, we characterize those whose order polytopes have minimal and maximal volume. We give a combinatorial characterization

of the circuits in related order polytopes and then conclude that all of their triangulations are unimodular.
For a generalized snake word, we count the number of flips for the canonical triangulation of these order polytopes.
We determine that the flip graph of the order polytope of the poset whose lattice of upper order ideals comes from a ladder is the Cayley graph of a symmetric group. Lastly, we introduce an operation on triangulations called twists and prove that twists preserve regular triangulations.

Melissa Sherman-Bennett – The $m = 2$ amplituhedron and the hypersimplex

I'll discuss a curious correspondence between the $m = 2$ amplituhedron, a $2k$-dimensional subset of $Gr(k, k + 2)$, and the hypersimplex, an $(n - 1)$-dimensional polytope in $\mathbb{R}^n$. The amplituhedron and hypersimplex are both images of the totally nonnegative Grassmannian under some map (the amplituhedron map and the moment map, respectively), but are different dimensions and live in very different ambient spaces. I'll talk about joint work with Matteo Parisi and Lauren Williams in which we give a bijection between decompositions of the amplituhedron and certain matroidal decompositions of the hypersimplex (originally conjectured by Lukowski–Parisi–Williams). We also give a new decomposition of the $m = 2$ amplituhedron into Eulerian-number-many chambers, inspired by an analogous hypersimplex decomposition.

Eran Nevo – Vertex spanning planar Laman graphs in triangulated surfaces

We prove that every triangulation of either of the torus, projective plane and Klein bottle, contains a vertex-spanning planar Laman graph as a subcomplex. Invoking a result of Király, we conclude that every 1-skeleton of a triangulation of a surface of nonnegative Euler characteristic has a rigid realization in the plane using at most 26 locations for the vertices. The main ideas will be explained by pictures.

Tours and Travels

Bangalore is conveniently located for many different types of travel trips. For an exhaustive list of options from Bangalore, visit the KSTDC website. The Jungle Lodges, also a government of Karnataka undertaking, offers series of resort holidays depending on activity: beach, safari etc. The service is good, and the views from the accommodations are superior to what is available from private operators.

Trips in and out Bangalore:

Bangalore - Possible places to spend a day or a half-day in Bangalore are

1. Lalbagh gardens
2. Cubbon Park
3. MG Road/ Brigade Road/ Commercial street for shopping and/or watering holes
4. A walk around the historic Malleswaram district
5. Explore the 16th century Bull temple

Belur/ Halebeedu/ Shravanabelagola - Visit Hoysala period temples renowned for their stone carvings (11th century) and a Mahaveer Jain monolith. The best organized trip is one by KSTDC. More Info

Mysore - The erstwhile capital of Karnataka and the abode of its last rulers. This trip covers among other things - Srirangapatna (Tipu Sultan's palace), Chamundi Hills, Mysore Palace. More info

Ranganthittu Bird Sanctuary - An excellent place for bird lovers. If you would like to leisurely explore the sanctuary you can make a private group trip via taxi. A possible itinerary could then be: Srirangapatna, break at Hotel Mayura (by the Cauvery river), and finally, the sanctuary. More info

Overnight trips around Bangalore:

Chikmagalur – Home to some of India's finest coffee estates, Chikamagalur is surely a true delight to any nature lover. You can learn about the history and varieties of coffee

grown in Karnataka at the Coffee Museum. Bhadra Wildlife Sanctuary, famous for its tigers, is a great choice for any ecotourist. For those who choose to do so, an option for accommodation is provided by Jungle Lodges. Another way to experience Chikmagalur would be to explore one of the various homestays run by private operators. More info

Coorg (Kodagu)– Further west of Mysore, nestled in the Western Ghats, is the hill country of Coorg. It is known for its coffee estates and its distinct Kodava culture and language. The source of the Cauvery river (Talakaveri), and the Tibetan Buddhist monastery and settlement at Kushalnagara are local attractions. KSTDC's Mayura Hotel in the district headquarters of Madikeri is an excellent overnight stay option.

Bandipur – On a safari here you may get to spot the elusive tiger. The safari sans tiger is also memorable and can offer sightings of elephants, deers, gaurs and others. The best accommodation is offered by Jungle Lodges.

Kabini – A safari option in Nagarhole National Park. Stay on the banks of the Kabini river on the southern fringe of Nagarhole. Again, Jungle Lodges provides the best accommodation option. (Recommended)

Hampi – The capital city of the mighty Vijayanagara empire, which now lies in ruins on the banks of the Tungabhadra river in northern Karnataka. As a UNESCO World Heritage site, this is a must-see on any tourist itinerary of South India. More info

Devbagh - Located in the northwest of Karnataka, this coastline is different from the one at Goa or Kerala, and quite enjoyable. However, you will be traveling there in the Monsoon season so be prepared to risk dark clouds and pouring rain. More info

Hikes and Treks around Bangalore:

The areas around Bangalore offer a plethora of hiking trails that offer beautiful vistas. Atop these hills one comes face to face with lakes, verdant greens, cityscapes, temples, or the ruins of historic forts. For more information about hikes and treks around Bangalore visit Karnataka state's eco tourism website. Since the conference is taking place in the monsoon season and hiking can be a dangerous activity, be sure to check the weather if you plan to go on a hike.

Nandigiri - Perhaps the quintessential Bangalore hiking experience, located about 60km along the airport road. Nandi Hills is a perfect respite from the hustle and bustle of the city. A host of available amenities such as food, trekking guides, well marked trails, and clear signage has lead to its popularity. The original temples atop Nandi Hills are over 1100 years old which have been added to by the many dynasties that ruled over the area since then. Many other sights of historical significance such as the Tipu Sultan's Summer Palace are demarcated by the aforementioned signage so you won't miss a thing. An option for accomodation atop Nandi Hills is Hotel Mayura Pine Top. More info

Skandagiri - Part of the Nandi Hills range along with the aforementioned Nandigiri, Skandagiri is one of the more challenging treks around Bangalore. Standing 1300m tall Skandagiri offers a breathtaking view of the sunrise bolstered by the cottony clouds. During the monsoon this trail get very slippery so be sure to wear approriate footwear. More Info

Makalidurga - Durga in the vernacular means a fort. Located in the Doddaballapura region, Makalidurga was a hill fort first established by the Vijayanagara empire and has changed hands several times since. The rocky trail makes for a rewarding trekking experience and the view from the top is sprinkled with lakes, hillocks, and bracketed by train tracks, and asphalted roads. In the interest of preservation this trek is supervised by Karnataka Eco-Tourism, and you need the Forest Department's permission. More Info

Savandurga - Savinadurga, as it's colloquially called, is known as the fort of death due to its steep inclines. Its claim to fame is that it is one among Asia's largest monolithic rocks. During the monsoon, the rocky path can pose a challenge to trekkers. The two temples at the top are frequented by devotees across the land making this a popular destination. More info

Excursions outside Bangalore:

If you wish to customise an itinerary please contact the organizers. Private taxi hire or overnight stay arrangements can be made after you get to Bangalore, except in the case of the tiger reserves of Bandipur and Nagarhole, accommodation for which should be booked in advance. The cost of hiring a taxi for a day trip will depend on mileage and type of vehicle you hire; the cost would be in the range of Rs. 15-20/km. Please note that in India when you hire a car, the driver is included, even on overnight trips! Driving in India is best left to the experts.

Cab/Taxi: You can arrange taxis from IISc campus by contacting one of the following call taxi agencies.

1. Aishwarya Travels - +91-80-2364 7403 / +91-87927 12047
2. Smart Travels - +91-80-2341 6564 / +91-99720 18099 //
3. Varsha Tours and Travels - +91-80-2357 0029 / +91-99808 73172

Code of conduct

The Organizing Committee of FPSAC 2022 is committed to providing a rewarding and welcoming experience for all. We are committed to ensuring that FPSAC 2022 is professional and free of harassment and discrimination in all of its events. Furthermore, we are dedicated to creating a supportive environment that benefits from the diversity of experiences of all its participants. We aim to offer equal opportunity and treatment to every participant regardless of their mathematical experience, sex, gender identity, nationality, race or ethnicity, belief, age, marital status, sexual orientation, disability, or any other factor.

We will not tolerate any form of discrimination or harassment. If you experience harassment or discriminatory behavior at a conference event, we urge you to reach out to any member of the organizing committee so we may take appropriate actions to address the situation.

Special rules apply for hybrid conferences. We require that every participant appearing online represent themselves by the name that they use for their professional work or in conferences. In addition, any speech or imagery that is posted in the chats or forms of the various conference activities must be appropriate for professional work.

Participants who violate this code may be sanctioned and/or expelled from the event at the discretion of the Organizing Committee. Any action will only be taken with the consent of the complaining party.

If you witness harassment or discriminatory behavior, please consider intervening. We need the whole community to work together to make this event the welcoming and rewarding experience for all that we strive to achieve. Thank you for your cooperation.

Acknowledgments. Parts of this agreement are based on: Federico Ardila's Code of Conduct of ECCO (Encuentro Colombiano de Combinatoria) available here; on the Code of Conduct of EuroCrypt 2020 available here; on statements by the Association for Women in Mathematics and the XOXO Festival; and on this website here.

Inside IISc

Nesara Restaurant
Sarvam Complex

New BEL Road, Ramaiah Gate

Auntie Fung's (Pan Asian)
Corner House (Ice Cream)
Dindigul Thalappakatti Restaurant (South Indian Biriyani)
Grub Monkeys New BEL Road (American)
Have More Punjabi Restaurant (Punjabi)
Nandhana Palace (Andhra)
Natural Ice Cream (Ice Cream)
Onesta (Italian, Continental)
Shiv Sagar Express (Pure veg)
Snow Lion Tibet Kitchen
Truffles Sanjaynagar (Continental)

Mathikere, NIAS Gate

Bong Connection (Bengali)
Calicut Restaurant (Kerala)
Chandrappa Hotel (South Indian)
Thalassery Restaurant (Malabar)
The Wokchow (Chinese)

Malleswaram, Maramma Gate

Khandani Rajdhani
Punjab Grill Malleshwaram

Yeshwanthpur, Main Gate

Absolute Barbecues, Yeshwanthpur