

TEJAS IYER

Personal Webpage: <https://iyertejas.github.io> **GitHub:** <https://github.com/iyertejas>

OVERVIEW

I am a probability theorist studying phase transitions and structural phenomena in evolving random systems, using methods from probability and probabilistic combinatorics. My work is motivated by applications to biology and epidemiology, complex networks, and increasingly learning-driven dynamics, including feedback loops in the training of AI systems. My research spans reinforced stochastic processes, random discrete structures, branching processes and interacting particle systems.

ACADEMIC APPOINTMENTS

Postdoctoral Fellow in the “Interacting Random Systems Group” June 2021 - Present
Weierstrass Institute, Berlin, Germany.
Supported by SPP2265: Random Geometric Systems.

LMS Early Career Fellow, University of Birmingham, UK Feb 2021 - May 2021

EDUCATION

Doctor of Philosophy in Pure Mathematics, Sept 2017 - 2021 (conferred July 2022)
University of Birmingham, Birmingham, UK.
Thesis: “Evolving Inhomogeneous Random Structures” supervised by Nikolaos Fountoulakis, and co-supervised by Richard Mycroft.

Bachelor of Philosophy (Honours), (GPA: 6.75) Feb 2013 - Dec 2016
Australian National University, Canberra, Australia.
First Class Honours in Mathematics, 92 %.
Thesis: “Random Tournaments” supervised by Brendan McKay and co-supervised by Kim Morrison.

Semester Abroad, ETH Zurich, Switzerland Feb 2015 - June 2015

PUBLICATIONS

1. Tejas Iyer. A counter-example to persistence in generalised preferential attachment trees. *Electron. Commun. Probab.*, 31:Paper No. 1, 3, 2026
2. Luisa Andreis, Tejas Iyer, and Elena Magnanini. Convergence of cluster coagulation dynamics. *Electron. J. Probab.*, 31:Paper No. 87, 29, 2026
3. Luisa Andreis, Tejas Iyer, and Elena Magnanini. Gelation in cluster coagulation processes. *Ann. Inst. Henri Poincaré Probab. Stat.*, 62(3):2142–2156, 2026
4. T. Iyer. Fixation of leadership in non-Markovian growth processes. *Stochastic Processes and their Applications*, 199:104968, 2026
5. Tejas Iyer. On a sufficient condition for explosion in CMJ branching processes and applications to recursive trees. *Electron. Commun. Probab.*, 29:Paper No. 46, 12, 2024
6. Tejas Iyer. Degree distributions in recursive trees with fitnesses. *Advances in Applied Probability*, 55(2):407–443, 2023
7. Nikolaos Fountoulakis and Tejas Iyer. Condensation phenomena in preferential attachment trees with neighbourhood influence. *Electronic Journal of Probability*, 27(none):1 – 49, 2022
8. Nikolaos Fountoulakis, Tejas Iyer, Cécile Mailler, and Henning Sulzbach. Dynamical models for random simplicial complexes. *The Annals of Applied Probability*, 32(4):2860 – 2913, 2022

9. Mikhail Isaev, Tejas Iyer, and Brendan D. McKay. Asymptotic enumeration of orientations of a graph as a function of the out-degree sequence. *Electron. J. Combin.*, 27(1):Paper 1.26, 2020

PREPRINTS

1. Tejas Iyer. Growth scales and uniform integrability of branching processes in varying environments. arXiv preprint arXiv:2607.05332, 2026
2. Johannes Bäuml and Tejas Iyer. Permutations in competing growth processes and balls-in-bins. arXiv preprint arXiv:2510.07104, 2025
3. Tejas Iyer. Persistent hubs in CMJ branching processes with independent increments and preferential attachment trees. arXiv preprint arXiv:2410.24170, 2024
4. Tejas Iyer and Bas Lodewijks. On the structure of genealogical trees associated with explosive Crump-Mode-Jagers branching processes. arXiv preprint arXiv:2311.14664, 2023

AWARDED GRANTS & FELLOWSHIPS

WIAS Young Scientist Grant

(up to €1400 for visiting Sophie Hautphenne at University of Melbourne in Oct 2024)

July 2024

WIAS Young Scientist Grant

(up to €750 for hosting the research stay of Bas Lodewijks in Oct 2023)

Sept 2023

LMS Early Career Fellowship (£3498)

Feb 2021 - May 2021

GRANT DEVELOPMENT

Prepared an ARC DECRA application (2025) and a MATH+ application (2026), and contributed substantially to the DFG SPP2265 proposal supporting my WIAS position.

INDUSTRY / EXTERNAL ENGAGEMENT

Led a 2026 European Study Group with Industry project proposed by Orange on cyber-attacks and defence policies in large networks. Formulated the mathematical programme, coordinated mathematical and computational contributions, and presented the resulting work to the industry partner.

PRIZES & SCHOLARSHIPS

€300 Prize for ‘best talk’ at Postdoc Day Berlin

Nov 2024

Boyapati Computer Science and Mathematics Honours Scholarship

2016

Exchange Scholarship ETH Zurich

2015

TEACHING

TEACHING QUALIFICATIONS

Introduction to Academic Practice for Doctoral Researchers with Distinction

Oct 2018 - June 2019

University of Birmingham, Birmingham, UK.

Associate Fellowship of the Higher Education Academy

June 2019 - Present

Higher Education Academy, UK.

TEACHING EXPERIENCE

Experienced in designing curricula and delivering full lecture courses in probability to mixed undergraduate/graduate audiences.

Lecturer, Technical University of Berlin.

2025-present

Sole lecturer with full responsibility for curriculum design, lecture notes, exercises, course administration and assessment for the following courses:

- Advanced Probabilistic Methods Related to Reinforcement Learning
(multi-armed bandits, regret bounds, MDPs)

Winter Semester 2026/27

- Branching Processes
- Percolation Theory

Summer Semesters 2025 and 2026
Winter Semester 2025/26

Postgraduate Teaching Assistant, University of Birmingham.

Sept 2017 - May 2021

- Teaching assistant for a variety of undergraduate maths courses, including Statistics, Differential Equations, Algebra and Combinatorics and Numerical Methods.
- Supervised and graded undergraduate research projects as part of the ‘Maths in Industry’ course.
- From September 2017 to June 2018 provided individual support to a visually impaired student, for the courses Metric Spaces and Topology and Advanced Topics in Algebra.
- Worked in the *Mathematics Support Centre* in the library, assisting students and researchers from across the university.

Teaching Assistant, Australian National University

March - Oct 2016

- Teaching assistant for first year calculus and linear algebra courses (MATH 1003 and MATH 1014). Role included designing and writing weekly quizzes.

RESEARCH SUPERVISION

- Manes Lehmann, Master’s thesis, TU Berlin (ongoing).
- Orion Mauduit, ENS Paris-Saclay research internship/project (April–August 2026): “Asymptotic democracy in nonlinear Pólya urns”; work being continued as a research project.
- Leo Kieslich, Bachelor’s thesis, TU Berlin (2022): “Coagulation processes”. Grade 1.0 (highest possible); co-supervised with Elena Magnanini.

INVITED TALKS

Growth scales of branching processes in varying environments.

Mathematics seminar, University of Koblenz, Germany

1–4 July 2026

Leadership in non-Markovian growth processes.

- TCS and discrete mathematics seminar, Heidelberg University, Germany 22nd May 2025
- UNSW Combinatorics Day 17 Oct 2024
- University of Melbourne Probability Seminar, Melbourne, Australia 2nd Oct 2024

Persistent hubs in generalised preferential attachment trees.

- Recent Advances in Evolving and Spatial Random Graphs, Bayrischzell, Germany 1-5 June 2025
- Monash University Probability and Statistics Seminar, Melbourne, Australia 3rd October 2024
- Probability Seminar Technical University of Darmstadt, Germany 20th June 2024
- Uppsala University Probability and Combinatorics Seminar, Sweden 23rd May 2024
- Stockholm University Seminar on Mathematical Statistics, Sweden 22nd May 2024

Gelation in cluster coagulation.

Phase transitions in spatial particle systems, Harnack-Haus, Berlin, Germany.

1st August 2023

Properties of recursive trees with independent fitness.

- Oberwolfach Workshop Random Graphs: Combinatorics, Complex Networks and Disordered Systems, Oberwolfach Research Institute for Mathematics, Germany 28th March 2023
- QMUL Complex Systems Seminar, London, United Kingdom (**online**) 14th February 2023

Genealogical trees of generalised branching random walks and some applications.

University of Münster Probability Seminar, Münster, Germany

16th November 2022

Inhomogeneous preferential attachment trees with neighbourhood influence

- University of Cologne Probability Seminar, Cologne, Germany 28th April 2022

- University of Florence Probability Seminar, Florence, Italy

17th November 2021

Evolving random trees with independent fitnesses

University of Melbourne Probability Seminar, Melbourne, Australia

12th May 2021

RESEARCH VISITS (SELECTED)

Visiting Johannes Bäuml, Koblenz University, Germany.

1-5 July 2026.

Visiting Julia Komjathy, Delft University of Technology, Netherlands.

9 - 13 Dec 2024.

Visiting Sophie Hautphenne, University of Melbourne, Australia.

30 Sept - 4 Oct 2024.

Visiting Tiffany Lo, Uppsala University, Sweden.

21-24 May 2024.

Visiting Luisa Andreis, University of Florence, Italy.

14-28 November 2021.

ACADEMIC AND ADMINISTRATIVE SERVICE WORKSHOP AND CONFERENCE ORGANISATION

Stochastic Processes with Reinforcement, Berlin

3-6 November 2026

- Co-organiser with Elena Magnanini; approximately 50 participants expected; external support secured from MATH+ and SPP2265.

Berlin Postdoc Days 2025, Humboldt University, Berlin

6-7 November 2025

- Co-organised with Basma Altattan, Amr Mostafa, Ridhima Das, Hemanth Pillai and Daniel Mutithu. About 100 participants.

WIAS Days 2023 (*internal conference*), Humboldt University, Berlin

6-7 March 2023

- Co-organised with Caroline Geiersbach and Anieza Maltsi. About 150 participants.

First Annual Conference of SPP2265: Random Geometric Systems, Harnack Haus, Berlin 11-14 April 2022

- Co-organised with Luisa Andreis, Wolfgang König, Elena Magnanini and Alexander Zass. About 75 participants.

REFEREEING

I have refereed for Stochastic Processes and their Applications, Random Structures and Algorithms, the Electronic Journal of Combinatorics, the Electronic Journal of Probability, Probability Theory and Related Fields, Annals of Applied Probability and the Applied Probability Trust.

OUTREACH

Outreach activities at the Weierstrass Institute

- Ran a station titled “The awesome working day of a probability theorist at the Weierstrass Institute” during a visit from high school students in Berlin on the 30th of November, 2022.
- In 2022, took part in a video on the theme “Diversity of Research” for Berlin Science Week.

Access to Birmingham Tutor, University of Birmingham

May - July 2018

- Supervised and graded projects from students applying to the university under the *Access to Birmingham Scheme*, designed for students from disadvantaged backgrounds.

AID India Volunteer

May - July 2017

- Prepared a curriculum guide to teaching fractions for primary school students in India. Designed for teachers not well versed with the subject matter.

Community Ambassador, Australian National University

2014, 2016

- Working as a tutor helping students from local disadvantaged high schools with homework.

REFERENCES

Available, on request, from the following mathematicians (follow links for contact details): Wolfgang König, Nikolaos Fountoulakis, Cécile Mailler, Brendan McKay.