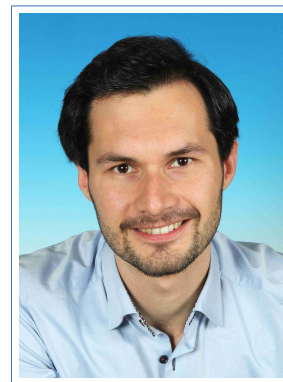


# Michael Wallner

## Curriculum Vitae



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📄 [dmg.tuwien.ac.at/mwallner](https://dmg.tuwien.ac.at/mwallner)

Two aspects have always fascinated me: **interdisciplinary applications of mathematics** and **international cosmopolitan communities**. For this reason, I studied numerical solutions of problems in physics during my MSc in London and the combinatorial analysis of algorithms during my MSc and PhD in Vienna. I then gained international experience by working as a postdoc abroad for almost 3 years. I enjoy interacting with researchers from different backgrounds, as illustrated by my 42 articles with 28 coauthors, in which I have developed new approaches in analytic combinatorics and applied them to models from computer science, biology, and physics. I was also admitted to the excellence training programs for leadership and management of **TU Wien** and the **Ludwig Boltzmann Gesellschaft**. These skills have greatly supported my work as a PI in my four very successful projects, which allowed me to employ and supervise a PhD student.

### Personal

Date of birth December 3<sup>rd</sup>, 1987 (36 years) in Oberwart  
Citizenship Austria  
Family status married (2017), 1 son (2020), 1 daughter (2021)

### Education

- 12/2023 **Habilitation in Mathematics**, *TU Wien*, Austria.  
Thesis: "Combinatorial Analysis of DAGs, Young Tableaux, and Lattice Paths"
- 11/2013–01/2017 **PhD in Mathematics**, *TU Wien*, Austria, Analytic combinatorics, discrete mathematics, lattice paths, compacted trees.  
Dissertation: „Combinatorics of Lattice Paths and Tree-like Objects“ supervised by Prof. Dr. Bernhard Gittenberger  
Promotio sub auspiciis presidentis rei publicae (Graduation with highest national distinction), awarded on 05/12/2017 by the Austrian president Dr. Alexander Van der Bellen
- 09/2011–09/2012 **Master of Science (MSc)**, *Brunel University London*, United Kingdom, Computational Mathematics with Modelling.  
Focus: FEM- and BEM-Methods for PDEs, Variational Calculus, Perturbation Theory, Integral Equations, Monte Carlo Methods for Asset Pricing  
Thesis Title: "Algebraic Multigrid Methods for Higher-Order Finite Element Discretization with Parallelization" supervised by Prof. Dr. Matthias Maischak  
Graduated with highest distinction
- 07/2011–10/2013 **Master of Science (Dipl.-Ing.)**, *TU Wien*, Austria, Technical Mathematics in the Computer Sciences.  
Focus: Discrete Mathematics, Calculus, Algebra, IT Security, Cryptography, Programming  
Thesis Title: "Lattice Path Combinatorics" supervised by Prof. Dr. Michael Drmota  
Graduated with highest distinction
- 10/2008–07/2011 **Bachelor of Science (BSc)**, *TU Wien*, Austria, Technical Mathematics in the Computer Sciences.  
Thesis Title: "Polynomials over finite fields" supervised by Prof. Dr. Michael Drmota  
Graduated with highest distinction
- 07/2007–01/2008 **Military service**, *Medic*, Austria.
- 09/2002–06/2007 **HTL Pinkafeld, Abteilung EDV und Organisation**, Austria.  
Austrian Matura passed with distinction

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## PhD thesis at TU Wien

- Title *Combinatorics of Lattice Paths and Tree-like Objects*
- Supervisor Ao.Univ.Prof. Dr. Bernhard Gittenberger, TU Wien
- Description The thesis is concerned with the enumerative and asymptotic analysis of directed lattice paths and tree-like structures. In the first part, several new models for lattice paths are introduced and some of their characterizing parameters, such as the number of returns to zero, or their average height and final altitude are analyzed. In the second part, enumerative and asymptotic results on compacted binary trees are solved. Such trees are a special class of directed acyclic graphs arising from a compression method.
- TU Wien The TU Wien is one of the main universities in Vienna, Austria. It has more than 28 000 students enrolled in 18 bachelor's, 33 master's, and 3 PhD programs; it has 8 faculties and about 5 000 staff members (3 800 academics). The university's teaching and research focuses on computer science, quantum physics, engineering, and natural sciences. For more information see [www.tuwien.at](http://www.tuwien.at).

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## Current position

- Since 02/2020 **Postdoc and PI (FWF J 4162 and P 34142)**, TU Wien, Institute of Discrete Mathematics and Geometry, Vienna, 1 year return phase of FWF J 4162; FWF Stand-Alone Project P 34142.

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## Previous positions

- 02/2018–01/2020 **Postdoc as Erwin Schrödinger Fellow (FWF J 4162)**, Université de Bordeaux, Laboratoire Bordelais de Recherche en Informatique (LaBRI), Bordeaux.
- 09/2017–12/2017 **Postdoc**, Université Paris 13, Laboratoire d'Informatique de Paris Nord (LIPN), Paris.
- 05/2017–07/2017 **Postdoc**, Academia Sinica, Institute of Statistical Science, Taipei.
- 02/2017–04/2017 **Postdoc**, TU Wien, Institute of Discrete Mathematics and Geometry, Vienna.
- 09/2015–01/2017 **External lecturer**, FH Campus Wien - University of Applied Sciences, Vienna.  
Small group tutoring in "Calculus 1" for electrical engineering students.
- 11/2013–04/2017 **Graduate teaching and research assistant**, TU Wien, Institute of Discrete Mathematics and Geometry, Vienna.  
Research in FWF project SFB F50-03; teaching and teaching administration in computer science BSc courses.
- 10/2012–01/2013 **Undergraduate teaching assistant**, TU Wien, Institute of Analysis and Scientific Computing, Vienna.  
Small group tutoring in numerical mathematics.

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## Career breaks

- 11/2022–03/2023 Paternity leave for my daughter Monika
- 01/2021–03/2021 Paternity leave for my son Albert

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## Grants

- 01/2023–12/2024 OeAD WTZ/PHC Amadeus FR 01/2023 *Asymptotic behavior of combinatorial structures*, principal investigator, 8k€
- 04/2021–12/2024 FWF Stand-Alone Project P 34142 *Stretched exponentials and beyond*, principal investigator, 400k€
- 02/2018–03/2021 FWF Erwin Schrödinger-Fellowship J 4162 *Combinatorial and probabilistic study of higher dimensional lattice paths and tree-like structures*, principal investigator, 157k€
- 12/2017–12/2019 Exzellenzstipendium für sub auspiciis Praesidentis Promovierende (Scholarship of excellence), 9k€
- 2012–2013 TUtheTOP Excellence programme at TU Wien

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## Supervision

- Since 2022 PhD student Manosij Ghosh Dastidar, TU Wien. Thesis: *Arithmetic, Asymptotic and Lacunary Properties of Generating Functions for Lattice Paths and Integer Partitions*
- 2024 MSc student Florian Schager, TU Wien. Thesis: *Analytic Combinatorics and Bijections for Directed Lattice Paths*

## Teaching

Course	Years	Hours/y	Students/y
Discrete Methods (MSc)	'14, '15, '16, '21, '22	24	25
Discrete Mathematics (MSc)	'21, '22	60	40
Analysis for Electrical Engineering (BSc)	'15, '16	65	30
Analysis for Computer Science (BSc)	'14, '15	36	40
Algebra for Computer Science (BSc)	'14 (2x), '15	36	50
Numerical Analysis (MSc)	'12	60	20

## Supervision of teaching assistants

Course	Year	Groups	TAs/Students
Analysis for Computer Science (BSc)	'15	3	5/171
	'14	3	2/96
	'13	2	2/79
Algebra for Computer Science (BSc)	'14	8	10/437
	'13	8	7/318

## Lecture

2015 Invited course "An Invitation to Analytic Combinatorics and Lattice Path Counting", 3<sup>rd</sup> ALEA in Europe Young Researchers' Workshop, University of Bath, UK

## Research areas

My main interests lie at the intersection of combinatorics, complex analysis, probability theory, number theory, and computer algebra, with a focus on exact and asymptotic enumeration and limit laws. I am interested in interdisciplinary applications, as illustrated by my results on automata, phylogenetic trees, digital expansions, and models of queueing theory.

Discrete objects Lattice paths, graph structures (phylogenetic networks, DFAs, DAGs), Young tableaux  
Computation Enumeration, generating functions, probability distributions, random generation  
Applications Computer science, biology, queueing theory, number theory

## Major research achievements

- (1) Asymptotic enumeration of **phylogenetic networks** and other **minimal DFAs** using the **Airy function**
- (2) Analyzing typical shapes of **periodic Young tableaux** and **periodic Pólya urns**
- (3) Solving lattice path models including a conjecture by Donald Knuth on the asymptotics of **periodic LPs**
- (4) Proving limit law schemes for generating functions with a focus on the **half-normal distribution**
- (5) Enumerating generalizations of Young tableaux using the **volume polytope/density method**

## Scientific activity

Publications 39 published (peer-reviewed), 3 submitted, 1 special issue as editor  
Talks 71 talks and 4 poster presentations at international events  
Coauthors 28 (Austria, Canada, China, France, India, Russia, Taiwan, USA)  
Reviews for int. journals and conferences Combinatorial Theory ◦ Journal of Combinatorial Theory, Series A ◦ Electronic Journal of Combinatorics ◦ Annals of Combinatorics ◦ Discrete Mathematics ◦ Discrete Mathematics and Theoretical Computer Science ◦ Journal of Integer Sequences ◦ Séminaire Lotharingien de Combinatoire ◦ Online Journal of Analytic Combinatorics ◦ Proceedings of Formal Power Series and Algebraic Combinatorics (FPSAC) ◦ Proceedings of the International Meeting on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA) ◦ Proceedings of the International Conference on Lattice Path Combinatorics & Applications ◦ Birkhäuser Science Lecture Notes in Applied and Numerical Harmonic Analysis series ◦ Mathematical Reviews ([mathscinet.ams.org](http://mathscinet.ams.org)) ◦ Zentralblatt ([zbmath.org](http://zbmath.org))

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## Training and soft skills

- 2023 [Writing Successful ERC Grants](#) (TU Wien/Yellow Research)
- 2022 [LEAD\\_able Programme](#) (Ludwig Boltzmann Gesellschaft): leadership, group dynamics, negotiation
- 2022 "Get Resilient!" for Predocs and Postdocs (TU Wien), [Visual Storytelling](#) (TU Wien)
- 2020 [Improving Your Scientific Papers](#) (TU Wien), [Open Access Publishing Essentials](#) (TU Wien)
- 2016 [Presenting yourself - Networking in English](#) (TU Wien)
- 2013–2014 [WINA+ Predoc Coaching](#) (TU Wien): scientific writing, presentation, time management
- 2012–2013 [TUtheTOP High Potential Programme](#) (TU Wien): leadership, presentation, networking
- 2007 [Quality management technician after ISO 9001](#) (Quality Austria)

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## Computer skills

- Programming [Java](#), [C++](#), [Python](#), [Fortran](#), [Matlab](#), [Maple](#)
- Database [Oracle](#), [MySQL](#), [SAP](#)
- Network [Cisco CCNA-Education](#)

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## Languages

- German [Mother tongue](#)
- English [Proficiency \(C2\)](#)
- Hungarian [Independent user \(B1\)](#)
- French [Basic user \(A2\)](#)

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## Interests

- Guitar [17 years music school Oberwart](#), member of different ensembles, participation at several concerts
- Climbing [Member of Alpenverein Edelweiss](#) (Austrian climbing society)
- Other [Hiking](#), [skiing](#), [gym](#), [board games](#), [books](#)

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## Peer recognition

### Awards

- 2021 [100\\$ OEIS donation in my name](#) by D. Zeilberger for proving in [Wallner 2022] the irrationality of critical exponents in generalized ballot sequences in 3 dimensions
- 2017 [Promotio sub auspiciis presidentis rei publicae](#), awarded by the Austrian president Dr. Alexander Van der Bellen, [BMBWF Excellence Scholarship](#), 9k€

### Editorial work

- 2024 Programme committee [FPSAC2024 Bochum](#) (most prestigious algebraic comb. conf.)
- 2024 Programme committee [AofA2024 Bath](#) (most prestigious analytic comb. conf.)
- 2023 DMTCS special issue dedicated to [Permutation Patterns 2023, Dijon](#)
- 2021 SLC special issue dedicated to [Lattice Path Conference 2021, CIRM](#)

### Conference organization

- 2021 Organizing committee member of *Lattice Path Combinatorics and Interactions* and co-editor of special issue, Luminy, France
- 2020 Program committee member of *Computational Logic and Applications*, online
- 2020 Scientific and organizing committee member of *L'École de Jeunes Chercheurs en Informatique Mathématique* (EJCIM2020), Bordeaux, France and online
- 2017 Organizing committee member of *ALEA in Europe Workshop*, Vienna, Austria
- 2017 Organizing committee member of the *European Conference on Combinatorics, Graph Theory and Applications*, Vienna, Austria
- 2016 Organizing committee member of the *4<sup>th</sup> ALEA in Europe Young Researcher's Workshop*, Vienna, Austria

- 2015 Organizing committee member of *AofA 2015*, Strobl, Austria  
2014–today Administrator of the website for *Arbeitsgemeinschaft Diskrete Mathematik* seminar, TU Wien, Austria

### Other

- 2011–2012 Student representative for the programme “Computational Mathematics with Modelling”, Brunel University London, UK  
2007 Team leader during final year project “Vienna Online Diabetes Education” at HTBL Pinkafeld, First prize at school competition “Jugend Innovativ”, category ICT

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## Popularization

- Since 2020 Member of the *TUForMath* team; responsible for interactions between mathematics and biology and school excursions in the *Natural History Museum Vienna*.  
05/2021 Public lecture at *TUForMath: Das 1x1 des evolutinären Stammbaums (German)*, TU Wien, Austria, 06/05/2021.  
09/2019 Newspaper article *Analysen von Algorithmen und Ahnenbäume* about my life in Bordeaux appeared in “*Die Presse*”, 13/09/2019.  
08/2019 Magazine article *Pfade und Bäume in Bordeaux* about my experiences as a Schrödinger-Fellow in Bordeaux, *scilog–Magazin des Wissenschaftsfonds FWF*, 07/08/2019.  
12/2018 Talk at the 7<sup>th</sup> *Weihnachtskolloquium: Asymptotic Enumeration of Compacted Binary Trees*, TU Wien, Austria, 21/12/2018.

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## 10 most important invited scientific talks

- 10 *Combinatorics of nondeterministic walks*, *Applied Mathematics Webinar*, Online/BASRC and KSU, February 2024.
- 9 *Stretched exponentials and beyond*, *Workshop: Computer Algebra for Functional Equations in Combinatorics and Physics*, Institut Henri Poincaré, Paris, France, December 2023.
- 8 *Stretched exponentials in the asymptotics of phylogenetic network*, *Mathematics of Evolution-Phylogenetic Trees and Networks Workshop*, Institute for Math. Sciences, Singapore, September 2023.
- 7 *Counting and sampling gene families evolutionary histories*, *Workshop on Combinatorial and Stochastic Phylogenetics*, NCCU, Taipei, Taiwan, September 2023.
- 6 *Limit laws for lattice paths with catastrophes*, *Department of Mathematics, Guest lecture*, Klagenfurt, Austria, September 2022.
- 5 *Compacted binary trees and minimal automata admit stretched exponentials*, *CanaDAM 2021*, Online, Canada, May 2021.
- 4 *More Models of Walks Avoiding a Quadrant*, *CanaDAM 2021*, Online, Canada, May 2021.
- 3 *Periodic Pólya Urns and Asymptotics of Triangular Young tableaux*, *Journées de combinatoire de Bordeaux*, LaBRI, Bordeaux, France, February 2019.
- 2 *Limit laws for lattice paths with catastrophes*, *Joint Mathematics Meetings 2019*, Baltimore, USA, January 2019.
- 1 *Periodic Pólya urns and an application to Young tableaux*, *Journée MathStic - Combinatoire, probabilités, et physique*, LIPN, Paris, France, May 2018.

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## Poster presentations

- 4 *Dyck paths and inversion tables*, *Permutation Patterns 2023*, Dijon, France, July 2023.
- 3 *Young Tableaux with Periodic Walls: Counting with the Density Method*, *33rd Int. Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2021)*, Online/Ramat-Gan, Israel, January 2022.
- 2 *Latticepathology and symmetric functions*, *Lattice Paths, Combinatorics and Interactions*, Online/CIRM, Marseille, France, July 2021.
- 1 *The reflection-absorption model for directed lattice paths*, *VIENNA young SCIENTISTS SYMPOSIUM (VSS16)*, Vienna, Austria, June 2016.

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## Coauthors

- 1 Cyril Banderier, Université Sorbonne Paris Nord, France
- 2 Mireille Bousquet-Mélou, Université de Bordeaux, France
- 3 Yu-Sheng Chang, National Chengchi University, Taipei, Taiwan
- 4 Cedric Chauve, Simon Fraser University, Canada
- 5 Élie de Panafieu, Bell Labs, Paris, France
- 6 Manosij Ghosh Dastidar, TU Wien, Austria
- 7 Andrew Elvey Price, Université de Bordeaux, France
- 8 Wenjie Fang, Université Paris-Est Marne-la-Vallée, France
- 9 Michael Fuchs, National Chengchi University, Taipei, Taiwan
- 10 Antoine Genitrini, Sorbonne Université, France
- 11 Bernhard Gittenberger, TU Wien, Austria
- 12 Emma Yu Jin, Universität Wien, Austria
- 13 Manuel Kauers, Johannes Kepler Universität, Austria
- 14 Christian Krattenthaler, Universität Wien, Austria
- 15 Alan Krinik, California State Polytechnic University, Pomona, USA
- 16 Dmitry Kruchinin, Tomsk State University, Russia
- 17 Vladimir Kruchinin, Tomsk State University, Russia
- 18 Markus Kuba, FH-Technikum Wien, Austria
- 19 Marie-Louise Lackner, TU Wien, Austria
- 20 Mohamed Lamine Lamali, Université de Bordeaux, France
- 21 Hexuan Liu, National Chengchi University, Taipei, Taiwan
- 22 Philippe Marchal, Université Sorbonne Paris Nord, France
- 23 David T. Nguyen, UC Santa Barbara, USA
- 24 Yann Ponty, École Polytechnique, France
- 25 Florian Schager, TU Graz, Austria
- 26 Lukas Spiegelhofer, Montanuniversität Leoben, Austria
- 27 Stephan Wagner, TU Graz, Austria
- 28 Guan-Ru Yu, National Kaohsiung Normal University, Taiwan

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## Additional new collaboration partners

I am collaborating with additional partners on joint papers, with whom I have not yet published; see section on work in progress in separate list of publications.

- 29 George Andrews, Penn State, USA
- 30 Olivier Bodini, Université Sorbonne Paris Nord, France
- 31 Zbigniew Gołębiewski, Wrocław University of Science and Technology, Poland
- 32 Baptiste Louf, Université de Bordeaux, France
- 33 Alexandros Singh, Université Sorbonne Paris Nord, France
- 34 Małgorzata Sulkowska, Wrocław University of Science and Technology, Poland
- 35 Noam Zeilberger, École Polytechnique, France

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## Publications

The major research achievements and most important publications are marked by their respective number.

### Peer-reviewed journal papers

submitted<sup>(3)</sup> ***Combinatorics of nondeterministic walks***  
with Élie de Panafieu, 42 pages, [arXiv:2311.03234](https://arxiv.org/abs/2311.03234).

- submitted<sup>(3)</sup> ***Bijections and congruences involving lattice paths and integer compositions***  
with Manosij Ghosh Dastidar, 30 pages, [arXiv:2402.17849](#).
- 2024<sup>(4)</sup> ***Phase transitions of composition schemes: Mittag-Leffler and mixed Poisson distributions***  
with Cyril Banderier, Markus Kuba, *Annals of Applied Probability* 34(5): 4635–4693 (2024), 59 pp.,  
[arXiv:2103.03751](#), [DOI:10.1214/24-AAP2076](#).
- 2024<sup>(3)</sup> ***Walks avoiding a quadrant and the reflection principle***  
with Mireille Bousquet-Mélou, *European Journal of Combinatorics*, Volume 119, Paper No. 103803, 49  
pages, [arXiv:2110.07633](#), [DOI:10.1016/j.ejc.2023.103803](#).
- 2024<sup>(1)</sup> ***Enumerative and Distributional Results for  $d$ -combining Tree-Child Networks***  
with Yu-Sheng Chang, Michael Fuchs, Hexuan Liu, and Guan-Ru Yu, *Advances in Applied Mathematics*  
157 (2024), 102704, 58 pages, [arXiv:2209.03850](#), [DOI:10.1016/j.aam.2024.102704](#).
- 2023 ***The binary digits of  $n + t$***   
with Lukas Spiegelhofer, *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)*, 24(1):1–31, 2023, [arXiv:2005.07167](#),  
[DOI:10.2422/2036-2145.202105\\_069](#).
- 2022<sup>(3)</sup> ***On the critical exponents of generalized ballot sequences in three dimensions and large tandem  
walks***  
*Aequationes mathematicae* 96, 815–826 (2022), [arXiv:2105.12155](#), [DOI:10.1007/s00010-022-00876-4](#).
- 2021<sup>(1)</sup> ***Compacted binary trees admit a stretched exponential***  
with Andrew Elvey Price, Wenjie Fang, *Journal of Combinatorial Theory, Series A*, 177 (2021), 105306,  
40 pages, [arXiv:1908.11181](#), [DOI:10.1016/j.jcta.2020.105306](#).
- 2020<sup>(2)</sup> ***Periodic Pólya Urns, the Density Method, and Asymptotics of Young Tableaux***  
with Cyril Banderier, Philippe Marchal, *Annals of Probability*, Volume 48, Number 4 (2020), 1921–1965,  
[arXiv:1912.01035](#), [DOI:10.1214/19-AOP1411](#).
- 2020<sup>(1)</sup> ***Asymptotic Enumeration of Compacted Binary Trees of Bounded Right Height***  
with Antoine Genitrini, Bernhard Gittenberger, Manuel Kauers, *Journal of Combinatorial Theory, Series A*,  
Volume 172, May 2020, 44 pages, [arXiv:1703.10031](#), [DOI:10.1016/j.jcta.2019.105177](#).
- 2020<sup>(4)</sup> ***A half-normal distribution scheme for generating functions***  
*European Journal of Combinatorics*, Volume 87, Article ID 103138, 21 pages, June 2020, [arXiv:1610.00541](#),  
[DOI:10.1016/j.ejc.2020.103138](#).
- 2020<sup>(5)</sup> ***Counting and sampling gene family evolutionary histories in the duplication-loss and duplication-  
loss-transfer models***  
with Cedric Chauve, Yann Ponty, *Journal of Mathematical Biology*, 80, pages 1353–1388(2020), [ar-  
Xiv:1905.04971](#), [DOI:10.1007/s00285-019-01465-x](#).
- 2019<sup>(1)</sup> ***A bijection of plane increasing trees with relaxed binary trees of right height at most one***  
*Theoretical Computer Science*, Volume 755, 10 January 2019, pages 1–12, [arXiv:1706.07163](#),  
[DOI:10.1016/j.tcs.2018.06.053](#).
- 2019 ***The Tu–Deng conjecture holds almost surely***  
with Lukas Spiegelhofer, *Electronic Journal of Combinatorics*, Volume 26 (2019), no. 1, Paper 1.28,  
28 pp., [arXiv:1707.07945](#), [DOI:10.37236/7178](#).
- 2018 ***On the shape of random Pólya structures***  
with Bernhard Gittenberger, Emma Yu Jin, *Discrete Mathematics*, Volume 341, Issue 4, April 2018,  
pages 896–911, [arXiv:1707.02144](#), [DOI:10.1016/j.disc.2017.12.016](#).
- 2018 ***Divisibility of binomial coefficients by powers of two***  
with Lukas Spiegelhofer, *Journal of Number Theory*, Volume 192, November 2018, pages 221–239,  
[arXiv:1710.10884](#), [DOI:10.4064/aa8524-6-2017](#).
- 2017 ***An explicit generating function arising in counting binomial coefficients divisible by powers of  
primes***  
with Lukas Spiegelhofer, *Acta Arithmetica* 181 (2017), 27–55, [arXiv:1604.07089](#), [DOI:10.4064/aa8524-  
6-2017](#).
- 2017<sup>(3)</sup> ***Lattice paths with catastrophes***  
with Cyril Banderier, *Discrete Mathematics & Theoretical Computer Science*, September 29, 2017,  
Vol 19 no. 1, [arXiv:1707.01931](#), [DOI:10.23638/DMTCS-19-1-23](#).

## Peer-reviewed papers in books

- 2019 **Explicit formulas for enumeration of lattice paths: basketball and the kernel method**  
with Cyril Banderier, Christian Krattenthaler, Alan Krinik, Dmitry Kruchinin, Vladimir Kruchinin and David Nguyen, Lattice Path Combinatorics and Applications, Developments in Mathematics, Springer-Verlag, Cham, 2019, pages 78–118, [arXiv:1609.06473](#), [DOI:10.1007/978-3-030-11102-1\\_6](#).
- 2019<sup>(3)</sup> **The kernel method for lattice paths below a line of rational slope**  
with Cyril Banderier, Lattice Path Combinatorics and Applications, Developments in Mathematics, Springer, Springer-Verlag, Cham, 2019, pages 119–154, [arXiv:1606.08412](#), [DOI:10.1007/978-3-030-11102-1\\_7](#).

## Peer-reviewed conference papers

- submitted<sup>(1)</sup> **The decompressed tree size of chains**  
17 pages.
- 2024<sup>(4)</sup> **Composition schemes:  $q$ -enumerations and phase transitions**  
with Cyril Banderier, Markus Kuba, Stephan Wagner, [AofA 2024](#), 18 pp., Bath, UK, [arXiv:2311.17226](#), [DOI:10.4230/LIPIcs.AofA.2024.7](#).
- 2024<sup>(1)</sup> **Asymptotics of relaxed  $k$ -ary trees**  
with Manosij Ghosh Dastidar, [AofA 2024](#), 13 pp., Bath, UK, [arXiv:2404.08415](#), [DOI:10.4230/LIPIcs.AofA.2024.15](#).
- 2024<sup>(3)</sup> **A bijection between stacked directed polyominoes and Motzkin paths with alternative catastrophes**  
with Florian Schager, [GASCom 2024](#), 8 pp., Bordeaux, France, [arXiv:2406.16417](#), [DOI:10.4204/EPTCS.403.34](#).
- 2024<sup>(3)</sup> **Bijections between variants of Dyck paths and integer compositions**  
with Manosij Ghosh Dastidar, [GASCom 2024](#), 7 pp., Bordeaux, France, [arXiv:2406.16404](#), [DOI:10.4204/EPTCS.403.22](#).
- 2023 **Dyck paths and inversion tables**  
[Permutation Patterns 2023](#), pages 142–144, Dijon, [WWW](#).
- 2022<sup>(1)</sup> **Enumeration of  $d$ -combining Tree-Child Networks**  
with Yu-Sheng Chang, Michael Fuchs, Hexuan Liu, and Guan-Ru Yu, [AofA2022](#), 12 pp., Philadelphia, [DOI:10.4230/LIPIcs.AofA.2022.5](#).
- 2021<sup>(5)</sup> **Young tableaux with periodic walls: counting with the density method**  
with Cyril Banderier, [SLC 85B.47](#), 12 pp., [FPSAC2021](#), Ramat Gan, [WWW](#).
- 2020<sup>(3)</sup> **More models of walks avoiding a quadrant**  
with Mireille Bousquet-Mélou, [LIPIcs](#), Vol. 159 - [Aofa 2020](#), 8:1–8:14, Klagenfurt, [DOI:10.4230/LIPIcs.AofA.2020.8](#).
- 2020<sup>(1)</sup> **Asymptotics of minimal deterministic finite automata recognizing a finite binary language**  
with Andrew Elvey Price, Wenjie Fang, [LIPIcs](#), Vol. 159 - [Aofa 2020](#), 11:1–11:13, Klagenfurt, [DOI:10.4230/LIPIcs.AofA.2020.11](#).
- 2020 **Latticepathology and symmetric functions (extended abstract)**  
with Cyril Banderier, Marie-Louise Lackner, [LIPIcs](#), Vol. 159 - [Aofa 2020](#), 2:1–2:16, Klagenfurt, [DOI:10.4230/LIPIcs.AofA.2020.2](#).
- 2019<sup>(3)</sup> **Combinatorics of nondeterministic walks of the Dyck and Motzkin type**  
with Élie de Panafieu, Mohamed Lamine Lamali, [ANALCO 2019](#): 1–12, San Diego, 2019, [arXiv:1812.06650](#), [DOI:10.1137/1.9781611975505.1](#).
- 2019 **De la probabilité de creuser un tunnel**  
with Élie de Panafieu, Mohamed Lamine Lamali, [AlgoTel 2019](#), Saint Laurent de la Cabrerisse, 2019, [HAL 02123269v1](#).
- 2018<sup>(2)</sup> **Periodic Pólya Urns and an Application to Young Tableaux**  
with Cyril Banderier, Philippe Marchal, [LIPIcs](#), Vol. 110 - [Aofa 2018](#), 11:1–11:13, 2018, Uppsala, [arXiv:1806.03133](#), [DOI:10.4230/LIPIcs.AofA.2018.11](#).



- 2018<sup>(5)</sup> **Rectangular Young tableaux with local decreases and the density method for uniform random generation**  
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