

Curriculum Vitae

Marvin Anas Hahn

WORK EXPERIENCE

Assistant professor (Tenure track) Trinity College Dublin	August 2022 –
Research assistant (Postdoc) Institut de mathématiques de Jussieu (Sorbonne Université) Mentor: Ilia Itenberg	October 2021 – July 2020
Research assistant (Postdoc) Max Planck Institute for Mathematics in the Sciences Mentor: Bernd Sturmfels	July 2020 – September 2021
Research assistant (Postdoc) Goethe University Frankfurt am Main Mentor: Annette Werner	September 2018 – June 2020
Research assistant (PhD student) University of Tübingen Mentor: Hannah Markwig	March 2016 – August 2018

EDUCATION

Visiting PhD Student University of Warwick Mentor: Diane Maclagan	October 2017 – December 2017
PhD Student University of Tübingen Mentor: Hannah Markwig Thesis: Combinatorics and degenerations in algebraic geometry: Hurwitz numbers, Mustafin varieties and tropical geometry	March 2016 – July 2018
M.Sc. in Mathematics (Honour's Degree) Saarland University Mentor: Hannah Markwig Thesis: Pruned Hurwitz numbers	October 2014 – October 2015
B.Sc. in Mathematics Saarland University Mentor: Hannah Markwig Thesis: Correspondence theorems for tropical Hurwitz numbers with special ramification profiles	October 2011 – July 2014

SCHOLARSHIPS AND GRANTS

Trinity Research Doctorate Award Funding: €106,750	March 2026 – February 2030
IRC Postgraduate Scholarship Funding: €106,750	September 2024 – August 2028
Hamilton Mathematics Institute – Conference Grant Funding: €10,000	September 2024
Foundation Compositio Mathematica – Conference Grant Funding: €2,500	September 2023
Hamilton Mathematics Institute – Conference Grant Funding: €6,000	September 2023
Research in Paris – Research stay at the Institute Henri Poincaré	September 2019
SIAM conference on applied algebraic geometry: Travel grant	July 2019

MEGA2019: Lodging grant	June 2019
Oberwolfach Leibniz Graduate Student	May 2019
Funded research stay Research programme "Tropical geometry, Amoebas and Polytopes" at Institute Mittag-Leffler	February and April 2018
Funded research stay Thematic trimester on "Combinatorics and interactions" at Institute Henri Poincaré	March 2017
Partial support by DFG SFB TRR 195 (INST 248/235-1)	January 2017 – August 2018
Scholarship for PhD students from Foundation of German Business	January 2016 – July 2018
Scholarship for students from Foundation of German Business	December 2011 – October 2015

RESEARCH INTEREST

<https://orcid.org/0000-0002-3197-9122>

ACCEPTED AND PUBLISHED PAPERS

- 20. Order-One Rolling Shutter Cameras** (with Kathlén Kohn, Orlando Marigliano, Tomas Pajdla) CVPR 2025: **Highlight** (2024), 11pp+26pp suppl.
- 19. Tropical twisted Hurwitz numbers for elliptic curves** (with Hannah Marwkgi) *to appear in Doc. Math.* (2025), 15pp
- 18. Combinatorics of Pruned Hurwitz numbers** (with Sean Gearoid Fitzgerald, Sífra Kelly) *to appear in Adv. Geom.* (2026), 43pp
- 17. Twisted Hurwitz numbers: Tropical and polynomial structures** (with Hannah Markwig) in *Algebr. Comb.* (2024), 27pp
- 16. Subspaces Fixed by a Nilpotent Matrix** (with Gabriele Nebe, Mima Stanojkovski, Bernd Sturmfels) in *Orbita Mathematicae 1.1* (2024), 15pp
- 15. Intersecting psi-classes on tropical Hassett spaces** (with Shiyue Li) in *Combinatorial Theory* (2022), 25pp
- 14. Orders and Polytropes: Matrix Algebras from Valuations.** (with Yassine El Maazouz, Gabriele Nebe, Mima Stanojkovski, Bernd Sturmfels) in *Beitr. Algebra Geom.* (2021), 14pp
- 13. Valued rank metric codes** (with Yassine El Maazouz, Alessandro Neri, Mima Stanojkovski) in *J. Algebra Appl.* (2023), 39pp
- 12. Mustafin models of projective varieties and vector bundles.** in *Int. Math. Res. Not.* (2021), 37pp
- 11. A short note on Cayley-Salmon equations.** (with Sara Lamboglia and Alejandro Vargas) in *Matematiche (Catania)* 75.2 (2020), p. 559-574, 16pp
- 10. Strongly semistable reduction of syzygy bundles on plane curves.** (with Annette Werner) *to appear in J. Lond. Math. Soc.* (2021), 21pp
- 9. Wall-crossing and recursion formulae for tropical Jucys covers.** (with Danilo Lewanski) in *Trans. Amer. Math. Soc.* 373 (2020), p. 4685-4711, 27pp
- 9. Triply mixed coverings of arbitrary base curves: Quasimodularity, quantum curves and a mysterious topological recursions.** (with Jan-Willem van Ittersum and Felix Leid) *to appear in Ann. Inst. Henri Poincaré D, Comb. Phys. Interact. (AIHPD)* (2020), 41pp
- 7. Bi-pruned Hurwitz numbers.** in *J. Combin. Theory Ser. A* 174 (2020), 22pp
- 6. Tropical Jucys Covers.** (with Danilo Lewanski) *to appear in Math. Z.* (2021), 15pp
- 5. Tropicalized quartics and canonical embeddings for tropical curves of genus 3.** (with Hannah Markwig, Yue Ren, Ilya Tyomkin) in *Int. Math. Res. Not.* 12 (2021) 31pp
- 4. Wall-crossing formulae and strong piecewise polynomiality for mixed Grothendieck dessins d'enfant, monotone, and simple double Hurwitz numbers.** (with Reinier Kramer, Danilo Lewanski) in *Adv. Math.* 336 (2018), 31pp

3. **Mustafin varieties, moduli spaces and tropical geometry.** (with Binglin Li) *to appear in Manuscripta Math.* (2020), 31pp
2. **A monodromy graph approach to the piecewise polynomiality of simple, monotone and Grothendieck dessins d'enfants double Hurwitz numbers.** in *Graphs Comb.* 35 (2019), 37pp
1. **Pruned double Hurwitz numbers.** in *Electron. J. Comb.* 24.3 (2017): P3-66, 32pp.

PREPRINTS

4. **Failing to keep the balance: explicit formulae and topological recursion for leaky Hurwitz numbers** (with Reinier Kramer) *Submitted.* (2026), 27pp
4. **Tropicalising hypergeometric τ -functions** (with Brian O'Callaghan and Jonas Wahl) *Submitted.* (2025), 27pp
3. **A refined twist on Hurwitz numbers** (with Raphaël Fesler, Maksim Karev and Hannah Markwig) *Submitted.* (2025), 65pp
2. **Universal piecewise polynomiality for counting curves in toric surfaces** (with Vincenzo Reda) *Submitted.* (2024), 24pp
1. **One-parameter families of multiview varieties and Bruhat–Tits buildings.** *Submitted.* (2020), 13pp

CONFERENCE PROCEEDINGS

Tropical Jucys Covers and applications. in *Oberwolfach Rep.* 16/2 (2020), p. 1278-1281

RESEARCH TALKS

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|---|---------------|
| Amplitudes and Algebraic Geometry
<i>Erwin Schrödinger Institut</i>
Title: Enumerative geometry and integrability | February 2026 |
| Summer Research Institute in Algebraic Geometry
<i>Colorado State University</i>
Title: Tropicalising hypergeometric τ -functions | July 2025 |
| Enumerative geometry in logarithmic, tropical and real world
<i>SwissMAP Research Station, Les Diablerets</i>
Title: Tropical geometry of b -Hurwitz numbers | April 2025 |
| Tropical Geometry Seminar
<i>University of Geneva</i>
Title: A tropical twist on Hurwitz numbers | December 2024 |
| Geometry Seminar
<i>University of Neuchâtel</i>
Title: Tropical combinatorics of the 2D Toda lattice | December 2024 |
| Mathematical Sciences Seminar Series
<i>University College Dublin</i>
Title: A tropical perspective on twisted Hurwitz numbers | October 2024 |
| Tropical geometry: Moduli spaces and matroids
<i>Goethe University Frankfurt am main</i>
Title: A tropical twist on Hurwitz numbers | October 2024 |
| Algebra and Number Theory Seminar
<i>University College Dublin</i>
Title: Tropical combinatorics and enumerative geometry | February 2024 |
| Boston College – TCD Mathematics Colloquium Series
<i>Trinity College Dublin</i>
Title: An invitation to tropical enumerative geometry | December 2023 |
| Algebraic Geometry Seminar
<i>University of Warwick</i>
Title: Mustafin degenerations of syzygy bundles | November 2023 |

Algebra and Number Theory Seminar <i>University of Vienna</i> Title: Mustafin degenerations of syzygy bundles	May 2023
Non-commutative Geometry meets Topological Recursion <i>Erwin Schrödinger International Institute for Mathematical Physics</i> Title: Combinatorics of pruned Hurwitz numbers	April 2023
Department of Mathematics & Statistics Colloquia <i>Maynooth University</i> Title: Tropical combinatorics and enumerative geometry	November 2022
COMB in CAMB <i>University of Cambridge</i> Lecture series on "Tropical Geometry of Bruhat–Tits buildings"	September 2022
Algebraic Geometry Seminar <i>University of Tübingen</i> Title: Orders, polytopes and matrix algebras	May 2022
Nonlinear Algebra Day <i>RWTH Aachen</i> Title: Intersecting psi-classes on tropical Hassett spaces	April 2022
Combinatorial Coworkspace <i>Haus Bergkranz (Goethe University Frankfurt am Main)</i> Title: Intersecting psi-classes on tropical Hassett spaces	March 2022
Seminar in Real & Complex Geometry <i>Tel Aviv University</i> Title: Intersecting psi-classes on tropical Hassett spaces	March 2022
Nonlinear Algebra Seminar Online <i>Max Planck Institute for Mathematics in the Sciences</i> Title: Degenerations in algebraic and applied geometry	February 2022
Online Algebraic Geometry Seminar <i>University of Nottingham</i> Title: The tropical geometry of monotone Hurwitz numbers	January 2022
Tropical Curves, Logarithmic Structures, and Enumerative Geometry <i>Mathematisches Institut Oberwolfach</i> Title: Quasimodularity of weighted Hurwitz numbers	October 2021
MEGA 2021: Effective Methods in Algebraic Geometry (Contributed talk with peer-review process) <i>CUiT – The Arctic University of Norway</i> Title: Mustafin degenerations: Between applied and arithmetic geometry	June 2021
Antwerp Algebra Colloquium <i>University of Antwerp</i> Title: Mustafin degenerations: Between applied and arithmetic geometry	March 2021
NASO – Nonlinear Algebra Seminar Online <i>Max Planck Institute for Mathematics in the Sciences</i> Title: Mustafin degenerations: Between applied and arithmetic geometry	January 2021
Weihnachtsworkshop zur Geometrie und Zahlentheorie <i>Karlsruhe Institute for Technology</i> Title: Mustafin models of plane curves and syzygy bundles	December 2019
Research seminar algebra <i>University of Osnabrück</i> Title: Strongly semistable reduction of syzygy bundles on plane curves	December 2019
Tropicalizing flag varieties <i>RWTH Aachen</i> Title: Mustafin degenerations - A tropical interface for the degeneration of flag varieties	November 2019

Buildings and Affine Grassmannians <i>Centre International de Rencontres Mathématiques (CIRM)</i> Title: Strongly semistable reduction of syzygy bundles on plane curves	August 2019
Geometry, integrability and moduli <i>Max Planck Institute for Mathematics</i> Title: Monotone coverings of arbitrary base curves (Poster)	August 2019
IRTG Seminar (SFB-TRR 195) <i>Neumühle in Mettlach-Tünsdorf</i> Title: Introduction to tropical geometry	July 2019
SIAM Conference on Applied Algebraic Geometry <i>University of Bern</i> Title: Tropical Jucys Covers and Applications	July 2019
MEGA 2019: Effective Methods in Algebraic Geometry (Contributed talk with peer-review process) <i>Complutense University of Madrid</i> Title: Hurwitz numbers and piecewise polynomiality properties	June 2019
Oberwolfach Workshop 'Tropical Geometry: New Directions' <i>Mathematisches Institut Oberwolfach</i> Title: Tropical Jucys Covers and applications	May 2019
Free Probability Seminar <i>Saarland University</i> Title:(Strictly) monotone coverings of arbitrary base curves: Quasimodularity, quantum curves and recursions	April 2019
Geometric Recursion Seminar <i>Max Planck Institute for Mathematics</i> Title: Topological recursion and enumerative problems	December 2018
First joint meeting of the KMS and DMV <i>COEX Seoul</i> Title: Mustafin varieties, tropical geometry and moduli spaces	October 2018
Summer School on Topological Recursion <i>University of Tübingen</i> Title: Tropical Jucys Covers and Quasimodularity of (strictly) monotone elliptic covers	August 2018
Spring School: Tropical Geometry meets Representation Theory <i>University of Cologne</i> Title: Piecewise polynomiality properties of Hurwitz-type counts	March 2018
Workshop on Combinatorics, polytopes, and complexity Mittag-Leffler Institute <i>Mittag-Leffler Institute</i> Title: What is a plane tropical curve?	February 2018
Spring School: Tropical Geometry meets Representation Theory <i>University of Cologne</i> Title: Piecewise polynomiality properties of Hurwitz-type counts	March 2018
Open Source Computer Algebra Research (OSCAR) <i>Max Planck Institute for Mathematics in the Sciences</i> Title: Faithful tropicalisations of plane quartics using linear modifications	December 2017
LMS Workshop in Tropical Mathematics <i>University of Birmingham</i> Title: A tropical approach to the piecewise polynomiality of monotone Hurwitz numbers	November 2017
Workshop "Recent advances on the geometry of valuations" <i>Goethe University Frankfurt</i> Title: Mustafin varieties, moduli spaces and tropical geometry	November 2017
First annual meeting of the DFG collaborative research center SFB-TRR 195 <i>RWTH Aachen</i> Title: Piecewise polynomiality properties of Hurwitz-type counts	September 2017

Stockholm Master Class in Tropical geometry <i>Stockholm University</i> Title: Piecewise polynomiality properties of Hurwitz-type counts	August 2017
Students' Conference on Nonarchimedean and Tropical Geometry <i>University of Regensburg</i> Title: Mustafin varieties, moduli spaces and tropical geometry	August 2017
Computing in tropical geometry <i>TU Berlin</i> Title: A moduli problem for Mustafin varieties	May 2017
Combinatorics and interactions <i>Institute Henri Poincaré</i> Title: Chamber behavior of mixed Hurwitz numbers (Poster)	March 2017

SUPERVISION

Ronan Zalatel Bachelor student Thesis: Intersecting ψ -classes on tropical moduli Spaces	2025–2026
Kevin Hegarty Bachelor student Thesis: Point–line geometry on the modified tropical plane	2025–2026
Brian O'Callaghan Bachelor student Thesis: Tropicalising hypergeometric τ -functions	2024–2025
Roisin Molloy Bachelor student Thesis: The Gonality Sequence of Complete Graphs	2024–2025
Sean Gearoid Fitzgerald PhD student Thesis: (Tropical) graphs on surfaces	2024–
Cian Boland Master's student Thesis: Forms of the KP Hierarchy	2024
Vincenzo Reda PhD student Thesis: Combinatorics and Tropical Geometry: Counting curves and rational points	2023–
Eoin Hanrahan Bachelor student Thesis: An Investigation into the Sparse Mixed Resultant and the Cayley Trick	2023–2024
Eva Nair Bachelor student Thesis: Maximum Likelihood Estimation for Linear Spaces of Symmetric Matrices	2023–2024
Síofra Kelly Bachelor student Thesis: Tropical Hurwitz numbers via cut–and–join recursions	2022–2023
Sean Gearoid Fitzgerald Bachelor student Thesis: Hurwitz galaxies, mobiles and pruned Hurwitz numbers	2022–2023
Aislinn Fitzpatrick Bachelor student Thesis: Towards Regular Subdivisions: Polytopes, Cones and Fans	2022–2023

SERVICE AND COMMITTEES

Co-organiser Experimental Mathematics Lab	2025–
Course Coordinator Undergraduate courses in Mathematics	2025–
Chair Hamilton Trust Fund Summer Research Internship	2023–2025
Member of PhD committee Thibaut Misme (PhD student at TCD)	2023–
Member of Selection committee Hamilton Trust Fund Summer Research Internship	2023
Member of Selection committee Scholarships for Bachelor's and Master's students (Stiftung der Deutschen Wirtschaft)	2022–

TEACHING

Topics in Combinatorial Algebraic Geometry Lecturer	Michaelmas Term 2025
Combinatorics Lecturer	Michaelmas Term 2025
Discrete Geometry Lecturer	Michaelmas Term 2025
Topics in Combinatorial Algebraic Geometry Lecturer	Michaelmas Term 2024
Algebraic Topology I Lecturer	Michaelmas Term 2024
Discrete Geometry Lecturer	Michaelmas Term 2024
Mathematics, Statistics and Computation Lecturer	Michaelmas Term 2024
Vector Calculus for Science Lecturer	Hilary Term 2023
Mathematics, Statistics and Computation Lecturer	Hilary Term 2023
Mathematics, Statistics and Computation Lecturer	Michaelmas Term 2022
Nonlinear Algebra seminar Co-organiser	August 2020 – December 2020
Non-archimedean geometry Teaching assistant	Summer term 2019
Analysis Teaching assistant	Summer term 2018
Ehrhart theory Teaching assistant	Summer term 2017
Hurwitz theory Teaching assistant	Winter term 2016/2017
Tropical geometry Teaching assistant	Summer term 2016
Linear algebra (review course) Lecturer	Winter term break 2014
Linear algebra (review course) Lecturer	Summer term break 2014

Various courses
Student assistant

2013–2015

ACTIVITIES

- Perspectives of Hurwitz theory: Moduli spaces, topological recursion and tropical geometry** June 2025
Hamilton Mathematics Institute, Dublin
Organised with Raphaël Fesler and Hannah Markwig
- A Tropical Panorama – Metric, Logarithmic and Analytic Structures** September 2023
Hamilton Mathematics Institute, Dublin
Organised with Navid Nabijou
- Minisymposium: Applications of Tropical Geometry** August 2021
SIAM Conference on Applied Algebraic Geometry
Organised with Yue Ren and Benjamin Schröter
- Minisymposium: Foundations of Tropical Geometry** August 2021
SIAM Conference on Applied Algebraic Geometry
Organised with Yue Ren and Benjamin Schröter
- Tropical Geometry in Frankfurt (TGiF)** June 2019 – June 2020 (quarterly)
Goethe University Frankfurt am Main
Organised with Sara Lamboglia and Martin Ulirsch
- Buildings, Varieties and Applications** November 11 – 13, 2019
Max Planck Institute for Mathematics in the Sciences
Organised with Bernd Sturmfels and Leon Zhang
- Summer School on Topological Recursion** August 27 – 31, 2018
University of Tübingen
Organised with Felix Leid, Hannah Markwig and Roland Speicher
- Referee reports** for Journal of High Energy Physics, Geometry and Topology, SIAM Journal on Applied Algebra and Geometry, Journal of Combinatorial Theory (Series A), etc.

LANGUAGES

German	native speaker
English	fluent
French	basic