

Victoria Schleis

✉ victoria.m.schleis@durham.ac.uk

🌐 victoriaschleis.github.io

Academic positions

- Since June 2024 **Postdoctoral Research Associate**, *Durham University, UK*, Postdoctoral Mentors: Yue Ren and Jeff Giansiracusa
- 2025 **Member**, *Institute for Advanced Study, Princeton, USA*, Mentors: Federico Ardila Mantilla and June Huh

Education

- 2021–2024 **Ph.D. Mathematics**, *Universität Tübingen, Germany*, Advisor: Hannah Markwig
Thesis Topic: Tropical Quiver Grassmannians and Tropical Enumeration on Ruled Surfaces,
Defence: 7 November 2024, Conferment: 5 January 2025
- 2020–2021 **M.Sc. Mathematics**, *Universität Tübingen, Germany*
- 2017–2020 **B.Sc. Mathematics**, (*Minor in Computer Science*), *TU Kaiserslautern, Germany*

Papers

Preprints

- [1] Narayan Collins, Victoria Schleis, *The polytope of all matroids of ranks 2 and 3*, arxiv:2605.12336, May 2026
- [2] Arman Marti-Shahandeh, Yue Ren, Victoria Schleis, *Zero-dimensional tropicalizations in OSCAR*, arxiv:2511.23298, December 2025
- [3] George Balla, Daniel Corey, Igor Makhlin, Victoria Schleis, *Regular subdivisions, bounds on initial ideals, and categorical limits*, arxiv:2411.12819, May 2025
- [4] Jeffrey Giansiracusa, Felipe Rincón, Victoria Schleis, Martin Ulirsch, *Logarithmic concavity for independent sets of valuated matroids*, arxiv:2407.05808, July 2024
- [5] Giulia Iezzi, Victoria Schleis, *Tropical Quiver Grassmannians*, arxiv:2311.18648, November 2023

Publications

- [6] Alessio Borzì, Victoria Schleis, *Linear degenerate tropical flag varieties*, Proceedings of the Royal Society of Edinburgh, Section A (to appear)
- [7] Thomas Blomme, Victoria Schleis, *Tropical Möbius strips and ruled surfaces*, Annales de l'Institut de la faculté de Toulouse, April 2025
- [8] Hannah Markwig, Lukas Ristau, Victoria Schleis, *Faithful tropicalizations of hyperelliptic curves*, Book chapter in: The Computer Algebra System OSCAR: Algorithms and Examples (p. 403–428), Algorithms and Computation in Mathematics (32), Springer, January 2025
- [9] Daniele Agostini, Hannah Markwig, Clemens Nollau, Javier Sendra Arranz, Victoria Schleis, Bernd Sturmfels, *Recovery of plane curves from branch points*, Discrete & Computational Geometry, 07 September 2023

Survey papers

- [10] Mara Belotti, Michael Joswig, Chiara Meroni, Victoria Schleis, Johannes Schmitt, *Computations in Oscar*, SIAM News, September 2023

Current work-in-progress

Tropical and matroidal representation theory

- [1] Yifan Guo, Victoria Schleis, *Linear algebra over bands*, expected Autumn 2026
- [2] Yifan Guo, Victoria Schleis, *Tropical representation theory*, expected Winter 2026
- [3] Alex Fink, Victoria Schleis, *Tropical algebraic monoids*

Symmetries for efficiency in combinatorial algorithms

- [4] Daniel Longenecker, Victoria Schleis, *Symmetric reconstruction of polytopes*, expected Autumn 2026
- [5] Dante Luber, Yue Ren, Victoria Schleis, *Tropical varieties in OSCAR*, expected Winter 2026

Grants

Autumn 2025 **LMS Scheme 1 grant**, *Conference support for MEGA 2026*, £5,300

Software

- [1] `polytope_of_all_matroids.jl`, Sole author, accompanying preprint [1]
- [2] `OscarZeroDimensionalTropicalization.jl`, Author, accompanying preprint [2]
- [3] `OscarTropicalization.jl`, Author (in progress), accompanying work in progress [5]
- [4] `EquivariantEhrhartTheory.m2`, Author (in progress)
- [5] `Tropical.m2`, Contributor
- [6] `gfanInterface.m2`, Contributor

Teaching experience

Autumn 2026 **Computational Algebra and Geometry (Lecturer)**, Durham University
Spring 2026 **Dynamics & Relativity (TA)**, Durham University
Autumn 2025 **Computational Algebra and Geometry (Lecturer)**, Durham University
Summer 2022 **Toric Ideals (TA)**, Universität Tübingen
Winter 2021 **Analysis I for Computer Science Students (TA)**, Universität Tübingen
Summer 2020 **Introduction to Symbolic Computing (TA)**, TU Kaiserslautern

Supervision

Undergraduate summer research projects

- 2026 **Charlotte Nicholas** *Möbius functions on inverse lattices*
- 2025 **Narayan Collins** *The polytope of all matroids in ranks 2 and 3*, resulting in preprint [1]
Madeleine Langdon-Morris *Tropical enumerative geometry on locally toric surfaces*, starting an M.Sc. at Warwick
Jagoda Zygmunt *Tropical enumerative geometry on Teichmüller spaces*
- 2024 **Arman Marti-Shahandeh**, *Efficient tropicalization of zero dimensional varieties* (jointly supervised with Yue Ren), resulting in preprint [2], now a Master's student at Oxford
Yalan Zhao, (jointly supervised with Yue Ren), now a Ph.D. student at Paderborn

Talks

Invited conference talks

- **Representation Theory over Bands**, BIRS-CMO workshop on the Geometry of matroids, Oaxaca, Mexico, October 2026
- **Linear Algebra over Bands**, DMV Jahrestagung, Koblenz, Germany, September 2026
- **Symmetric polytope realization**, SIGMAP, Brussels, Belgium, July 2026
- **Linear Algebra over Bands**, Fundamental Geometries, Bologna, Italy, June 2026
- **Linear algebra over bands** (invited short talk), Rigidity theory, ICMS Edinburgh, UK, May 2026
- **Sampling on Dressians**, SIAM AG25 Madison (Minisymposium), July 2025
- **The moduli space of matrices**, Mathematical Congress of the Americas, Miami, US, July 2025
- **Tropical Quiver theory**, Combinatorial Christmas: Geometry without Geometry, Frankfurt, Germany, 7 December 2024
- **Tropical Enumerative Geometry on Ruled Surfaces**, LMS Tropical Day, QMUL London, UK, 13 November 2024
- **Tropical Quiver Grassmannians**, Geometry of Matroids, Institute for Advanced Study, Princeton, US, 25 October 2024
- **Linear Maps in Tropical Geometry**, Applied Algebra Meeting, Edinburgh, UK, 11 July 2024
- **Tropical Enumerative Geometry on Ruled Surfaces**, Geometry in its Symplectic, Tropical and Real aspects (GeoStAR), Switzerland, 15 May 2024
- **Quiver Dressians**, SIAM AG23 Eindhoven (Minisymposium), 10 July 2023
- **Linear degenerate tropical flag varieties**, LMS Tropical Day, Birmingham, UK, 17 February, 2023

Upcoming:

- **Computing tropical varieties**, BIRS-IASM workshop on Computational Algebraic Geometry, Hangzhou, China, June 2027

Selected invited seminar talks

- **Representation theory over hyperfields**, Geometry Seminar, St Andrews, 29 January 2026
- **General linear monoids over hyperfields**, Arithmetic study group, Durham, UK, October 2025
- **Representation theory over hyperfields**, Algebra Seminar, York, UK, October 2025
- **Tropical Representation Theory**, Special Year seminar, IAS Princeton, US, June 2025
- **The moduli space of matrices**, Algebra Seminar, Georgia Tech, US, 24 February 2025
- **Logarithmic concavity of independent sets for valuated matroids**, Tropical Geometry Seminar, London, UK, 12 November 2024
- **Tropical Quiver Representations** Brown University, October 2024
- **Initial degenerations of torus equivariant subvarieties**, Frankfurt, Germany, September 2024
- **Tropical Quiver Representations**, F1 World Seminar (Online), 31 January 2024
- **Quiver Dressians**, TU Berlin, 24 January 2024
- **Tropical Quiver Representations**, Roma Tor Vergata, 1 December 2023
- **Quiver Dressians**, Algebra seminar, Groningen, 20 June 2023
- **Quiver Matroids**, Combinatorics seminar, KTH Stockholm, 19 April 2023
- **Linear degenerate tropical flag varieties**, Oberseminar Algebra and Representation theory, Aachen, 31 January 2023
- **Linear degenerate tropical flag varieties**, Tropical Geometry in Frankfurt, Frankfurt, Germany, 3 February 2023
- **Quiver representations in tropical geometry**, Aachen, Bochum and Cologne seminar on Rep-

resentation theory, Aachen, 14 July 2022

Conference organization

- **MEGA 2026 (Effective Methods in Algebraic Geometry)**, Local Organizer, Durham, July 2026
- **Computational Algebraic Geometry Workshop**, Organizer, Durham, 18-22 November 2024
- **Summer school on tropical linear spaces**, Organizer, Tübingen, 9-13 September 2024
- **International Congress on Mathematical Software (ICMS)**, Local and Session Organizer, Durham, 22-25 July 2024

Outreach and service

- 2026 - Career panel, Postgraduate Research Day, Durham University
- Volunteer at Spectres: Maths on the Beach (General audience outreach event)
- Undergraduate colloquium at *Count me in*, Edinburgh
- 2025 - Career discussion and general participation, Women+ and Math, IAS Princeton
- Talk at the Noetherian Ring seminar, an undergraduate women in maths seminar at Princeton
- Represented the School of Mathematics of the IAS Princeton at several donor events
- 2024 - Volunteer at Celebrate Science (General audience outreach event, aimed at 4-10 year olds)
- Judge at the Jugend forscht Landeswettbewerb Baden-Württemberg (German national science competition, State round, section on mathematics and computer science)
- Talk at QTMC London
- Career panel and advice sessions for high schoolers, Lichtenbergschule Darmstadt
- Volunteer at the open day (University of Tübingen)
- 2023 - Judge at the Jugend forscht Landeswettbewerb Baden-Württemberg (German national science competition, State round, section on mathematics and computer science)
- Volunteer at the open day (University of Tübingen)
- pre 2023 - Talk at the EWM-EMS summer school on *Moduli Spaces*
- several roles in the departmental student council
- moderator of Ravi Vakil's *Algebraic Geometry Syndicate*, organised online career events and discussions

I have also written referee reports for: *Annals of Combinatorics*, *Experimental Mathematics*, *Journal of the LMS*, *Mathematica Scandinavica*, *Representation Theory*, the *Société Mathématique de France*, and the *Transactions of the AMS*. Furthermore, I helped edit the *Proceedings of the ICMS, 2024*.

References

- June Huh, Professor, Princeton University, huh@princeton.edu
- Bernd Sturmfels, Direktor, MPI MIS Leipzig, bernd@mis.mpg.de
- Yue Ren, Associate Professor, Durham University, yue.ren2@durham.ac.uk