Matthew Dupraz

Ph.D. student at FU Berlin

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Education

2024 – Sep 2027 (expected) **Ph.D. Mathematics**, *Freie Universität*, Berlin
DFG project *"K-theory and normal complexes"* (SPP 2458 *"Combinatorial Synergies"*)
Advisors: *Prof. Christian Haase and Dr. Leonid Monin (EPFL)*

2022 – 2024 **M.Sc. Mathematics** (with minor in Computer Science), *EPFL*, Lausanne
Obtained the *EPFL Master Excellence Fellowship*
Thesis: *Tropical linear systems and the realizability problem*, arXiv: 2506.21268
Advisor: *Prof. Francesca Carocci*

2019 – 2022 **B.Sc. Mathematics**, *EPFL*, Lausanne

Publications and Preprints

- **Projected Brion's theorem**, with L. Monin, preprint, arXiv: 2610.38674.
- **A Riemann–Roch theorem for Frobenius quotients**, with A. Gross and L. Monin, preprint, arXiv: 2607.26176.
- **Tropical linear series and matroids**, with C.-W. Chang, H. Iriarte, D. Jensen, D. Karp, S. Payne, and J. Wang, to appear in Trans. Amer. Math. Soc., arXiv: 2508.20062.

Invited Talks

Nov 10, 2026 (upcoming) **Algebra Seminar**, *Friedrich Schiller University Jena*
Title: *A Riemann–Roch theorem for Frobenius quotients*

Feb 12, 2025 **Algebra, Geometry, and Combinatorics Seminar**, *San Francisco State University*
Title: *Tropical Linear Systems*

Contributed Talks

Apr 20, 2026 **GSM Applied Algebra and Combinatorics**, *University of Bristol*
Title: *A Riemann–Roch theorem for Frobenius quotients*

Mar 17, 2026 **Tropical Geometry, Moduli Spaces and Locally Symmetric Varieties**, *Bielefeld University*
Title: *A Riemann–Roch theorem for Frobenius quotients* (short talk)

Apr 29, 2025 **GSM Applied Algebra and Combinatorics**, *University of Bologna*
Title: *Tropical Linear Systems*

Apr 1, 2025 **Combinatorial Algebraic Geometry: Highlighting Underrepresented Genders**, *Goethe Universität Frankfurt am Main*
Title: *Lattice counts and K-theory* (short talk)

Research Visits

Feb–Mar 2027 (upcoming) **Queen Mary University of London**, London
Two-month research stay, hosted by *Alex Fink*

Feb 2025 **San Francisco State University**, San Francisco
One-week research visit, hosted by *Dustin Ross*

Organization

May 2026 **Young Researchers Conference on Combinatorial Synergies**
Local organizer, *FU Berlin*
Handled logistics: venue, website, registrations, catering, budget

Aug 2025 **Summer School: Positivity in K-Theory and Lattice Points**
Co-organizer, *Bernoulli Center, EPFL*, Lausanne
Main contact point with participants; managed website and social program

Teaching Experience

2024 – present **Coordinator**, *Lernzentrum, FU Berlin*
Coordinate student tutors and hold weekly drop-in hours for undergraduate courses

2020 – 2024 **Teaching assistant**, *EPFL*, Lausanne

- 2023–24: *Rings and fields*; *Analysis IV*; *Algebraic structures*; *Probability*
- 2021–22: *Advanced analysis II*; *Group theory*; *Metric and topological spaces*
- 2020–21: *Classical mechanics*; *Information, Computation, Communication*; *Fluids and electromagnetism*; *Object-oriented programming*

Software

2025 **Normal Complexes in Julia**, `github.com/MattDupraz/NormalComplexes.jl`
Julia package for computing the volume, Ehrhart and Snapper polynomials of normal complexes of matroids, implementing a formula from the Frobenius quotients paper

Tropical Linear Systems on an Interval, `github.com/MattDupraz/TLS_Interval`
Interactive web visualization of tropical linear systems of degree 2 on an interval

2024 **Tropical Linear Systems in Julia**, `github.com/MattDupraz/TropicalLinearSystems.jl`
Julia package for linear systems of divisors on tropical curves: chip-firing, extremals, realizability

Attended Conferences and Workshops

2026 **3rd Annual Conference of Combinatorial Synergies**, Frankfurt
Polyhedra in Lean, Berlin
Anisotropy and Lefschetz Properties in Combinatorics, Berlin
FPSAC 2026, Seattle
Research School in Real Algebraic Geometry, Trieste
Algebraic Aspects of Metric and Integral Geometry, Lausanne
Developments in Discrete, Algorithmic and Tropical Geometry, Berlin
Recent Developments on Lattice Polytopes, Leipzig

2025 **Combinatorial Geometries and Geometric Combinatorics Closing Conference**, Barcelona
Arbeitsgemeinschaft: Combinatorial Hodge Theory, Oberwolfach
Combinatorial Synergies Priority Program Annual Conference, Hannover
Combinatorial Synergies East, Leipzig

2024 **Geometry without Geometry**, Frankfurt
Tropical Geometry: Moduli Spaces and Matroids, Frankfurt
Combinatorial Synergies Kick-off Meeting, Osnabrück
Colombian Encounter of Tropical and Non-Archimedean Geometry, Bogotá