Curriculum Vitae

Anna-Laura Sattelberger, Dr. rer. nat.   February 2026

Contact

Institute	Max Planck Institute for Mathematics in the Sciences (MPI MiS), Leipzig, Germany
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Education and academia

04/26 – 08/26	**Deputy professor (W2) in geometry** Otto von Guericke University Magdeburg
07/24 – 12/28	**Group leader** in algebraic analysis within the ERC synergy grant *UNIVERSE+: Positive Geometry in Particle Physics and Cosmology* Max Planck Institute for Mathematics in the Sciences, Leipzig
10/22 – 06/24	**Postdoctoral researcher** with Prof. Kathlén Kohn in the multidisciplinary project *3D Scene Perception, Embeddings and Neural Rendering* KTH Royal Institute of Technology, Stockholm
09/21 – 12/21	**Research stay** in topological data analysis with Prof. Wojciech Chachólski Brummer & Partners MathDataLab, KTH Royal Institute of Technology, Stockholm
07/19 – 09/22	**Postdoctoral researcher** in applied algebraic analysis with Prof. Bernd Sturmfels Research group in nonlinear algebra, MPI MiS, Leipzig
10/15 – 05/19	**Doctoral studies** in mathematics in the field of algebraic analysis Thesis: *Topological Computation of Stokes Data of Weighted Projective Lines* Advisors: Prof. Marco Hien and Prof. Maxim Smirnov University of Augsburg
10/13 – 07/15	**Master of Science with Honors** in mathematics within the program *TopMath* Thesis: *From Turrittin–Levelt to the lower semi-continuity of families of $\mathcal{D}$-modules* Technical University of Munich
10/12 – 09/13	**Additional certificate: Elite Bachelor** in the program *TopMath* of the *Elite Network of Bavaria* University of Augsburg/Technical University of Munich
10/10 – 08/13	**Bachelor of Science** in mathematics, minor subject: philosophy Thesis: *Irregularity and spectral norm of differential modules* University of Augsburg

Publications and preprints   arXiv, Google Scholar, ORCİD

[18] **Border Bases in the Rational Weyl Algebra** (with C. Rodriguez). *Advances in Applied Mathematics* 177:103065, 2026.

[17] **Connection Matrices in *Macaulay2*** (with P. Görlach, J. Koefler, M. Sayrafi, H. Schroeder, N. Weiss, and F. Zaffalon). Preprint `arXiv:2504.01362`, 2025. Submitted.

[16] **Algebraic and Positive Geometry of the Universe: from Particles to Galaxies** (with C. Fevola). *Notices of the American Mathematical Society*, 72(8):808–817, 2025.

[15] **Differential Equations for Moving Hyperplane Arrangements** (with A. Pfister). Special volume on Positive Geometry, *Le Matematiche*, 80(1):409–429, 2025.

[14] **Algebraic Approaches to Cosmological Integrals** (with C. Fevola, G. L. Pimentel, and T. Westerdijk). Special volume on Positive Geometry, *Le Matematiche*, 80(1):303–324, 2025.

[13] **Geometry of Linear Neural Networks: Equivariance and Invariance under Permutation Groups** (with K. Kohn and V. Shahverdi). *SIAM Journal on Matrix Analysis and Applications*, 46(2):1378–1415, 2025.

[12] **D-Module Techniques for Solving Differential Equations in the Context of Feynman Integrals** (with J. Henn, E. Pratt, and S. Zoia). *Letters in Mathematical Physics*, 114(87), 2024.

[11] **D-Algebraic Functions** (with R. Ait El Manssour and B. Teguia Tabuguia). *Journal of Symbolic Computation*, 128(102377), 2025.

[10] **Vector Spaces of Generalized Euler Integrals** (with D. Agostini, C. Fevola, and S. Telen). *Communications in Number Theory and Physics*, 18(2):327–370, 2024.

[9] **Bayesian Integrals on Toric Varieties** (with M. Borinsky, B. Sturmfels, and S. Telen). *SIAM Journal on Applied Algebra and Geometry*, 7(1):77–103, 2023.

[8] **The Shift-Dimension of Multipersistence Modules** (with W. Chachólski and R. Corbet). *Journal of Applied and Computational Topology*, 8(3):643–667, 2024.

[7] **Nonlinear Algebra and Applications** (with P. Breiding, T. Çelik, T. Duff, A. Heaton, A. Maraj, L. Venturello, and O. Yürük). *Numerical Algebra, Control and Optimization*, 13(1):81–116, 2023.

[6] **Combinatorial Differential Algebra of x^P** (with R. Ait El Manssour). *Journal of Symbolic Computation*, 114:193–208, 2023.

[5] **Maximum Likelihood Estimation from a Tropical and a Bernstein–Sato Perspective** (with R. van der Veer). *International Mathematics Research Notices*, 2023(6):5263–5292, 2023.

[4] **Algebraic Analysis of the Hypergeometric Function $_1F_1$ of a Matrix Argument** (with P. Görlach and C. Lehn). *Beiträge zur Algebra und Geometrie*, 62:397–427, 2021.

[3] **Algebraic Analysis of Rotation Data** (with M. F. Adamer, A. C. Lőrincz, and B. Sturmfels). *Algebraic Statistics*, 11(2):189–211, 2020.

[2] **D-Modules and Holonomic Functions** (with B. Sturmfels). In *Varieties, polyhedra, computation*. Volume 22 of *EMS Series of Congress Reports*, pp. 251–293, EMS Press, Berlin, 2025.

[1] **Topological Computation of Stokes Matrices of some Weighted Projective Lines**. *Manuscripta mathematica*, 164(3):327–347, 2021.

Teaching and work experience

Summer term '26	**Full lectures and proseminar for Bachelor and Master students of mathematics and of teaching** Otto von Guericke University of Magdeburg
July 2025	**Invited lecture series** on *Algebraic Aspects of Linear PDEs* Domoschool2025, Domodossola
Spring 2025	**Reading group** on *Geometric Representation Theory and D-Modules* Scientific organizer together with Veronica Calvo Cortes MPI MiS, Leipzig
Autumn 2024	**Lecture:** *Introduction to Algebraic Analysis* Teaching assistant: Carlos Gustavo Rodriguez Fernandez MPI MiS, Leipzig

Autumn 2023	**PhD course** on *D-Modules and Holonomic Functions* KTH Royal Institute of Technology and Stockholm University
08/2023	**Invited lecture series** on *Algebraic and Holonomic Statistics* Hypergeometric School 2023, Kobe University
Spring 2023	**Lecturer** of the undergraduate course *Calculus in One Variable* KTH Royal Institute of Technology, Stockholm
12/20 − 08/22	**Equal Opportunity Officer** Max Planck Institute for Mathematics in the Sciences, Leipzig
09/2019	**Fall School: Varieties, Polyhedra, Computation** Exercise session for the lecture series on *D-Modules and Holonomic Functions* Berlin Mathematics Research Center
09/15 − 06/19	**Research assistant** of Prof. Marco Hien at the University of Augsburg ⋄ Tutoring diverse lectures in Mathematics ⋄ Tutoring and organizing a help desk for students of Mathematics ⋄ Tutoring and organizing a study program for pupils
08/13 − 08/15	**Scientific assistant in the project *Best MINT*** of the Bavarian State Ministry for Education, Science and the Arts at the University of Augsburg
08/12 − 09/12	**Intern** at *SGL Carbon* in Meitingen Mathematical modeling of the extrusion of ceramic materials
10/11 − 07/13	**Student assistant** at the University of Augsburg Tutoring lectures on Linear Algebra and Commutative Algebra

Selected talks and scientific organizing

06/2026	**Lecture series by Stephen Melczer: An Invitation to Analytic Combinatorics** Scientific organizer with Dr. Maximilian Wiesmann MPI MiS, Leipzig
03/2026	**Seminar Algebra, Representations, Topology** Invited talk: *Border Bases in the Rational Weyl Algebra* Institut de Recherche Mathématique Avancée, Strasbourg
02/26 − 03/26	**ESI thematic program: Amplitudes and Algebraic Geometry** Scientific organizer with Prof. Daniele Agostini, Prof. Lara Bossinger, Prof. Ruth Britto, Prof. Johannes Henn, Dr. Jianrong Li , and Prof. Oliver Schlotterer Erwin Schrödinger International Institute for Mathematics and Physics, Vienna
10/2025	**Workshop on Algebraic Models in Data Science and Quantum Systems** Invited talk: *Algebraic computations with linear PDEs behind functions in the sciences* University of Augsburg
10/2025	**Chow Lectures 2025: Nima Arkani-Hamed** Scientific organizer together with Joris Koefler and Dr. Simon Telen MPI MiS, Leipzig
09/2025	**Workshop on Singularities, D-modules, and Connections to Physics** Invited participant Banff International Research Station for Mathematical Innovation and Discovery
07/2025	**Chemnitz Mathematical Colloquium** Invited talk: *An Algebraic Treatment of Linear PDEs* Technical University of Chemnitz

06/2025	**Amplitudes 2025** Invited: *Writing Systems of Linear PDEs in Matrix Form via Gröbner Bases* Seoul National University
01/2025	**Oberseminar on Data Science** Invited talk: *Geometry of Equivariant Linear Neural Networks* Technical University of Munich
10/2024	**UNIVERSE+ workshop: Holonomic Techniques for Feynman Integrals** Scientific organizer together with Hofie Hannesdóttir, PhD, and Prof. Johannes Henn Max Planck Institute for Physics, Garching near Munich
09/2024	**Conference: Integral Structures in Geometry and Representation Theory** Invited talk: *Combinatorial Correlators* Paderborn University
08/2024	**Elliptics and Beyond '24** Invited talk: *D-Module Tricks for Solving Differential Equations* Max Planck Institute for Physics, Garching near Munich
08/2024	**Program on Special Functions: from Geometry to Fundamental Interactions** Invited participant Munich Institute for Astro-, Particle and BioPhysics (MIAPbP)
07/24 – today	**Positive Geometry Seminar** Scientific organizer Max Planck Institute for Mathematics in the Sciences, Leipzig
07/2024	**9th European Congress of Mathematics (9ECM)** Minisymposium: *D-Modules and Applications* Invited talk: *D-Module Techniques for Solving Differential Equations* University of Seville
04/2024	**Mathematics and Applied Mathematics (MAM) seminar** Invited talk: *Geometry of Equivariant Linear Neural Networks* Mälardalen University, Västerås
03/2024	**MATHEXP-POLSYS seminar** Invited talk: *D-Module Techniques for Solving Differential Equations in the Context of Feynman Integrals* Inria Saclay, Palaiseau
02/2024	**Workshop: Positive Geometry in Particle Physics and Cosmology** Invited talk: *Shift relations among Feynman integrals via s-parametric annihilators* MPI MiS, Leipzig
02/2024	**Reading Group on Positive Geometry** Presentation: *Yoga with Polylogarithms* MPI MiS, Leipzig
01/2024	**Augsburger Mathematisches Kolloquium** Invited talk: *Geometry of Equivariant Linear Neural Networks* University of Augsburg
10/2023	**Applied CATS Seminar** Invited talk: *Geometry of Linear Neural Networks: Equivariance and Invariance under Permutation Groups* KTH Royal Institute of Technology, Stockholm

09/2023	**DMV Annual Meeting 2023**
	Section: *Mathematics of Data Science*
	Invited talk: *Algebraic Geometry of Equivariant Neural Networks*
	TU Ilmenau

08/2023	**ICIAM 2023**
	Minisymposium: *Hypergeometric functions in statistics and particle physics*
	Invt. talk: D-*Module Techniques for Solving DEs in the Context of Feynman Integrals*
	Waseda University, Tokyo

08/2023	**Hypergeometric School 2023**
	Invited talk: *Bayesian Integrals on Toric Varieties*
	Kobe University

08/2023	**Amplitudes 2023**
	Invited talk: D-*Module Techniques for Solving Differential Equations in the Context of Feynman Integrals*
	CERN, Geneva

07/2023	**SIAM Conference on Applied Algebraic Geometry (AG23)**
	Minisymposium: *Algebraic Invariants of Data*
	Invited minisymposium talk: *Bayesian Integrals on Toric Varieties*
	Eindhoven University of Technology

05/2023	**A Hypergeometric Day**
	Invited lecture: *Introduction to D-Modules and GKZ systems*
	MPI MiS, Leipzig

11/2022	**Uppsala/NORDITA amplitudes group meeting**
	Invited talk: *Algebraic Analysis of Feynman Integrals*
	Uppsala universitet

08/2022	**EWM General Meeting 2022**
	◇ Invited talk:*Toric Varieties as Probability Spaces*
	Minisymposium: *Real algebraic geometry in action with a view toward optimization*
	◇ Minisymposium: *Algebra and Geometry behind Data*
	Scientific organizer together with Miruna-Ştefana Sorea, PhD
	Aalto University, Helsinki

07/2022	**MIAPbP 2022 program: Novel Developments in Scattering Amplitudes**
	Invited talk: *Vector Spaces of Generalized Euler Integrals*
	Munich Institute for Astro-, Particle and BioPhysics, Garching

06/2022	**Algebraic Topology: Methods, Computation and Science (ATMCS10)**
	Talk: *The Shift-Dimension: An Algebraic Invariant of Multipersistence Modules*
	University of Oxford

06/2022	**AlToGeLiS Day**: one-day meeting with moderated problem sessions
	Scient. organizer w. Prof. Sandra Di Rocco, Prof. Liam Solus, and Francesca Tombari
	KTH Royal Institute of Technology

05/2022	**Seminar on Statistics and Data Science**
	Invited talk: *Bayesian Integrals on Toric Varieties*
	TU Munich

05/2022	**Applied Topology Seminar**
	Invited talk: *The Shift-Dimension: An Algebraic Invariant of Multiparameter Persistence Modules*
	TU Munich

04/2022 **Special ITS Seminar on structures of Feynman integrals**
Invited talk: *D-Module Techniques in Physics*
ETH-ITS Zürich

02/2022 **AlToGeLiS seminar**
Talk: *Algebraic Tools for Topological Data in a Multiparameter Setting*
MPI MiS, Leipzig

01/2022 **Mørketidens Mattemøte**
Invited talk: *The Shift-Dimension of Multipersistence Modules*
UiT – The Arctic University of Norway

11/2021 **Seminar Applied Combinatorics, Algebra, Topology & Statistics**
Invited talk: *Algebraic Aspects of Multiparameter-TDA*
KTH Royal Institute of Technology, Stockholm

08/2021 **SIAM Conference on Applied Algebraic Geometry (AG21)**
Session: Differential Equations in Algebraic Geometry and Beyond
Invited talk: *D-Modules in (Algebraic) Statistics*
Texas A&M University

07/2021 **Workshop on Math of Data**
Talk: *Stable Invariants for Multipersistence Modules*
MPI MiS, Leipzig

07/2021 **Mathematical Congress of the Americas**
Session: Differential operators in algebraic geometry and commutative algebra
Invited talk: *D-Modules in (Algebraic) Statistics*
University of Buenos Aires

06/2021 **Seminar on Nonlinear Algebra**
Talk: *How does an algebraic geometer interpret Taylor series?*
MPI MiS, Leipzig

06/2021 **MEGA 2021**
Talk: *Combinatorial Differential Algebra of x^p*
UiT – The Arctic University of Norway, Tromsø

04/2021 **Seminar on the Mathematics of Amplitudes**
Invited Talk: *MLE from a Tropical and a Bernstein–Sato Perspective*
IAS Princeton, MPI MiS Leipzig, and MPP Munich

02/2021 **Onlineseminar on Applied Algebra and Analysis**
Invited Talk: *MLE from a Tropical and a Bernstein–Sato Perspective*
TU Braunschweig and Osnabrück University

01/2021 **OSCAR rings in the new year**
Software presentation: `Singular` in `OSCAR`
MPI MiS, Leipzig

11/2020 **Workshop Computational Algebra 2020**
Invited talk: *Algebraic Analysis of the Hypergeometric Function $_1F_1$ of a Matrix Argument*
TU Kaiserslautern

09/2020 **Seminar on Nonlinear Algebra**
Talk: *Algebraic Tools for Topological Data Analysis*
MPI MiS, Leipzig

07/2020	**ICMS 2020 Session: Computational Algebraic Analysis** Scientific organizer together with Dr Christoph Koutschan TU Braunschweig
03/2020	**Seminar Number Theory and Algebraic Geometry** Invited talk: *D-modules: Linear PDEs from an algebraic perspective* KU Leuven
11/2019	**Seminar on Symbolic Computation** Invited talk: *Computational Algebraic Analysis* RICAM, Linz
11/2019	**Geometric Analysis Seminar** Invited talk: *D-modules and applications* Goethe University of Frankfurt
10/2019	**European Women in Mathematics: German Chapter Conference 2019** Talk: *Computational Algebraic Analysis* MPI MiS, Leipzig
09/2019	**Seminar: Computing with D-modules II** Scientific organizer together with Prof. Christian Sevenheck Talk: *Probability distributions as holonomic functions* MPI MiS, Leipzig
08/2019	**Seminar: Computing with D-modules** Talk: *How to compute? Part 2:* `Plural` MPI MiS, Leipzig
05/2019	**Otto–Sturmfels Day** Invited talk: *Algebraic Analysis: $\mathcal{D}$-Modules and PDEs* MPI MiS, Leipzig
04/2019	**Workshop: $\mathcal{D}$-modules and the Riemann–Hilbert correspondence** Invited talk: *Riemann–Hilbert for $\mathcal{D}$-modules arising from weighted projective lines* Humboldt University of Berlin

Scholarships and achievements

04/2026	**Young Academy of the Academy of Sciences and Literature | Mainz** Selected member for the duration of four years
02/2024	**Young Academy of the European Mathematical Society** Selected member
11/2021	**Sign Up! Careerbuilding 2022** of the Max Planck Society and EAF Berlin Selected candidate
09/16 – 05/19	**German Academic Scholarship Foundation** Doctoral scholarship
11/2015	**Hurwitz Society of the Technical University of Munich** Honoring for the Master's degree passed with distinction
10/12 – 09/15	**Max Weber-Program of the German Academic Scholarship Foundation** Scholarship
04/11 – 03/13	**Deutschlandstipendium** German public-private scholarship

Further qualifications

Language	**German** (native language) **English** (fluent) **French** (advanced; level C1) **Italian** (upper intermediate; level B2) **Swedish** (elementary; level A2)
Softskills	◇ **Planck Academy** (2021–2022) various trainings on topics including gender equality, unconscious bias, sexualized discrimination, and guiding challenging conversations ◇ **EAF Berlin | Diversity in Leadership** (2022) various trainings on topics including leadership & communication in academia, leadership presence, and vocational skills ◇ **Certificate for Teaching in Higher Education of the Bavarian Universities** (2015) diverse soft skill courses on rhetoric, voice training, moderation, team heading, consulting students, and many more in the program ProfiLehre
Interests	◇ **music** ◇ **sports** ◇ **abstract painting** ◇ **espresso**