# Rainer Sinn                    Lebenslauf

rainer.sinn@uni-leipzig.de       http://www.math.uni-leipzig.de/~sinn/index.html

---

## STELLE

Seit 2020: Professur für Angewandte Algebra (W2) an der Universität Leipzig

## WERDEGANG

2017 - 2020: Juniorprofessur für Diskrete Geometrie an der Freien Universität Berlin; von Juli 2018 bis September 2020 stellvertretende Leitung der Arbeitsgruppe

2017: Mitarbeiter in der Arbeitsgruppe Nonlinear Algebra am Max-Planck-Institut für Mathematik in den Naturwissenschaften, Leipzig

2014 - 2017: Visiting Assistant Professor am Georgia Institute of Technology, Atlanta, GA

## ABSCHLÜSSE

- Doktor der Naturwissenschaften (Dr. rer. nat.), summa cum laude, 2014 Betreuer: Claus Scheiderer
- Diplom in Mathematik (1,0), 2010

## AUSBILDUNG

- Doktorand an der Universität Konstanz, 2010 - 2014
- Erasmus Student an der Université Paris Diderot Paris VII, 2008/2009
- Student an der Universität Konstanz 2004-2009

## FORSCHUNGSINTERESSEN

Algebraische, diskrete, konvexe, reelle Geometrie
- Nichtnegative Polynome und Quadratsummen
- Konvexe, semi-algebraische Mengen
- Positive Geometrie

## DRITTMITTEL UND PREISE

- DFG Projekt "Positive Geometrie" im Rahmen des SPP "Combinatorial Synergies": 1 Doktorandenstelle (2024-2027)
- SAXAG (Anschubsprojekt des Sächsischen Staatsministeriums für Wissenschaft, Kultur und Tourismus): 9 Monate Postdoc-Stelle (2022)
- MaRDI (Verbundprojekt im Rahmen der NFDI), beteiligt an TA6 (Data Culture and Community Integration): 1 Postdoc-Stelle für die Laufzeit von 5 Jahren (2021-2026)
- DFG Projekt „Geometrie hyperbolischer Polynome" (mit Daniel Plaumann, TU Dortmund): 1 Doktorandenstelle (2019-2022)

- Simons-Berkeley Research Fellowship für das Semesterprogramm *Geometry of Polynomials* am Simons Institute, Berkeley (2019)
- [Pegasus]² Marie Skłodowska-Curie Fellowship der FWO (stattdessen die Stelle an der FU Berlin angetreten, 2017)
- Promotionsstipendium der Studienstiftung des deutschen Volkes 10/2011 - 03/2014
- Stipendium der Studienstiftung des deutschen Volkes 09/2008 - 03/2010

## LÄNGERE AUFENTHALTE

- Januar - Mai 2019: Simons Institute - Semesterprogramm *Geometry of Polynomials*
- September - Oktober 2018: ICERM - Semesterprogramm *Nonlinear Algebra*
- August - September 2017: MSRI - Semesterprogramm *Geometric and Topological Combinatorics* (Research Membership)
- Mai - Juli 2014: National Institute of Mathematical Sciences in Daejeon, Südkorea - *Thematic Program on Applied Algebraic Geometry*

## PUBLIKATIONEN

1. *Taking the amplituhedron to the limit*, mit Joris Koefler, Preprint 2025.
   https://arxiv.org/abs/2501.08221
2. *Spurious local minima in nonconvex sum-of-squares optimization*, mit Grigoriy Blekherman, Mauricio Velasco, und Shixuan Zhang, Preprint 2024.
   https://arxiv.org/abs/2411.02208
3. *Pythagoras Numbers for Ternary Forms*, mit Grigoriy Blekherman und Alex Dunbar, Preprint 2024.
   https://arxiv.org/abs/2410.17123
4. *Nonnegativity certificates on real algebraic surfaces*, mit Grigoriy Blekherman, Gregory G. Smith, und Mauricio Velasco, Preprint 2024.
   https://arxiv.org/abs/2409.08834
5. *Plane quartics and heptagons*, mit Daniele Agostini, Daniel Plaumann, und Jannik Lennart Wesner, Preprint 2024.
   https://arxiv.org/abs/2408.15759
6. *Nonnegative Polynomials and Moment Problems on Algebraic Curves*, mit Lorenzo Baldi und Grigoriy Blekherman, Preprint 2024.
   https://arxiv.org/abs/2407.06017
7. *Weak and Strong Extremal Biquadratics*, mit Grigoriy Blekherman, Bogdan Raita und Isabelle Shankar, Preprint 2022.
   https://arxiv.org/abs/2204.10625
8. *Moments, Sums of Squares, and Tropicalization*, mit Grigoriy Blekherman, Felipe Rincon, Cynthia Vinzant und Josephine Yu, Preprint 2022.
   https://arxiv.org/abs/2203.06291

9. *Do alcoved lattice polytopes have unimodal h^\*-vector*, mit Hannah Sjöberg, Preprint, 2021.
https://arxiv.org/abs/2104.15080

10. *Adjoints and Canonical Forms of Polypols*, mit Kathlén Kohn, Ragni Piene, Kristian Ranestad, Felix Rydell, Boris Shapiro, Miruna-Stefana Sorea und Simon Telen.
Documenta Mathematica, **30(2)**, 275-346, 2025

11. *Adjoints and Canonical Forms of Tree Amplituhedra*, mit Kristian Ranestad und Simon Telen.
Mathematica Scandinavica, **130(3)**, 433-466, 2024

12. *Convex hulls of surfaces in fourspace*, mit Chiara Meroni und Kristian Ranestad.
Collectanea Mathematica, 2024

13. *Tropical Positivity and Determinantal Varieties*, mit Marie-Charlotte Brandenburg und Georg Loho.
Algebraic Combinatorics, **6(4)**, 999-1040, 2023

14. *Landau on Chess Tournaments and Google's PageRank*, mit Günter M. Ziegler.
erscheint in *Edmund Landau: Collected Works*, Band 10, herausgegeben von A. Hüntelmann, A. Kreuzer, H. Wefelscheid und U. Wefelscheid

15. *Families of Faces and the Normal Cycle of a Convex Semi-algebraic Set*, mit Daniel Plaumann und Jannik Lennart Wesner.
Beiträge zur Algebra und Geometrie, **64**, 851-875, 2023

16. *The Chiral Domain of a Camera Arrangement*, mit Sameer Agarwal, Andrew Pryhuber und Rekha Thomas.
Journal of Mathematical Imaging and Vision, **64**, 948-967, 2022

17. *Hyperbolic Secant Varieties of M-Curves*, mit Mario Kummer,
Journal für die Reine und Angewandte Mathematik, **787**, 125-162, 2022

18. *On the Existence of Two View Chiral Reconstructions*, mit Andrew Pryhuber und Rekha Thomas.
SIAM Journal on Applied Algebra and Geometry, **6(1)**, 41-76, 2022

19. *Sums of Squares and Quadratic Persistence on Real Projective Varieties*, mit Grigoriy Blekherman, Gregory G. Smith und Mauricio Velasco.
Journal of the EMS, **24(3)**, 925-965, 2022

20. *Maximum Likelihood Estimation for Nets of Conics*, mit Stefan Dye, Kathlén Kohn, und Felix Rydell.
Le Matematiche, **76(2)**, 399-414, 2021

21. *Sums of Squares: A real projective story*, mit Grigoriy Blekherman, Gregory G. Smith und Mauricio Velasco.
Notices of the AMS, **68(5)**, 734-747, 2021

22. *On the Dimensions of the Realization Spaces of Polytopes*, mit Laith Rastanawi und Günter Ziegler.
Mathematika, **67(2)**, 342-365, 2021

23. *Conic Programming: Infeasibility Certificates and Projective Geometry*, mit Simone Naldi.
Journal of Pure and Applied Algebra, **225(7)**, 22 Seiten, 2021

24. *Kippenhahn's Theorem for Joint Numerical Ranges and Quantum States*, mit Daniel Plaumann und Stephan Weis.
SIAM Journal on Applied Algebra and Geometry, **5(1)**, 86-113, 2021

25. *Combinatorial Inscribability Obstructions for Higher-dimensional Polytopes*, mit Joseph Doolittle, Jean-Philippe Labbé, Carsten Lange, Jonathan Spreer, und Günter Ziegler.
Mathematika, **66(4)**, 927-953, 2020

26. *Typical and Generic Ranks in Matrix Completion*, mit Daniel Bernstein und Grigoriy Blekherman.
Linear Algebra and its Applications, **585**, 71-104, 2020

27. *Positive Semidefinite Univariate Matrix Polynomials*, mit Christoph Hanselka.
Mathematische Zeitschrift, **292(1-2)**, 83-101, 2019

28. *Maximum Likelihood Threshold and Generic Completion Rank of Graphs*, mit Grigoriy Blekherman.
Discrete and Computational Geometry, **61(2)**, 303-324, 2019

29. *Gram Specthrahedra*, mit Lynn Chua, Daniel Plaumann und Cynthia Vinzant.
In *Ordered Algebraic Structures and Related Topics*, vol. 697 of Contemporary Mathematics, 81-105. American Mathematical Society, Providence, RI, 2017

30. *Do Sums of Squares Dream of Free Resolutions?* mit Grigoriy Blekherman und Mauricio Velasco.
SIAM Journal on Applied Algebra and Geometry **1(1)** 175-199, 2017

31. *Low-Rank Sum-of-Squares Representations on Varieties of Minimal Degree*, mit Grigoriy Blekherman, Daniel Plaumann und Cynthia Vinzant.
International Mathematical Research Notices, **2019(1)**, 33-54, 2019

32. *Extreme Rays of the Hankel Spectrahedra for Ternary Forms*, mit Grigoriy Blekherman.
Journal of Symbolic Computation **79 (1)**, 23-42, 2017

33. *Real Ranks with Respect to Varieties*, mit Grigoriy Blekherman.
Linear Algebra and its Applications, **505**, 344-360, 2016

34. *Computing hermitian determinantal representations of hyperbolic curves*, mit Daniel Plaumann, David E Speyer, und Cynthia Vinzant.
International Journal of Algebra and Computation, **25(8)**, 1327-1336, 2015

---

35. *Generic Spectrahedral Shadows,* mit Bernd Sturmfels.
    SIAM Journal on Optimization, **25 (2)**, 1209-1220, 2015
36. *Algebraic Boundaries of Convex Semi-algebraic Sets.*
    Research in the Mathematical Sciences, **2 (1)**, 2015
37. *Algebraic Boundaries of Convex Semi-algebraic Sets,* Dissertation, 2014.
    http://nbn-resolving.de/urn:nbn:de:bsz:352-281616
38. *Algebraic Boundaries of SO(2)-Orbitopes.*
    Discrete and Computational Geometry, **50 (1)**, 219-235, 2013

## BUCH

1. Panorama der Mathematik, mit Andreas Loos und Günter M. Ziegler,
   Springer, Berlin, 2022

## DOKTORANDEN

1. Joris Köfler (IMPRS, MPI MiS Leipzig)
2. Julian Weigert (U Leipzig)
3. Jannik Wesner (betreut gemeinsam mit Daniel Plaumann, TU Dortmund)

## ABGESCHLOSSENE PROMOTIONEN

1. Marie-Charlotte Brandenburg (U Leipzig)
2. Hannah Sjöberg (betreut gemeinsam mit Günter Ziegler, FU Berlin)
3. Laith Rastanawi (betreut gemeinsam mit Günter Rote, FU Berlin)
4. Chiara Meroni (betreut gemeinsam mit Bernd Sturmfels, MPI MiS)

## SEMINARVORTRÄGE (AUSWAHL)

- Kolloquium TU Chemnitz
  *Sums of Squares: Theory and Applications* (2023)
- Seminar Gruppen und Geometrie, Bielefeld
  *Sums of Squares and Projective Geometry* (2022)
- Seminar Algebra, Jena
  *Sums of Squares and Projective Geometry* (2022)
- Seminar Algebra-Geometrie-Kombinatorik, TU Dresden
  *Polypols and their adjoints* (2021)
- Numerical Algebra and Optimization Seminar, MPI Leipzig
  *Chirality in Computer Vision* (2021)
- Seminar on Nonlinear Algebra, MPI Leipzig
  *Adjoints and Canonical Forms of Polypols* (2021)
- Discrete Mathematics/Geometry Seminar, TU Berlin
  *Realization Spaces of Polytopes* (2020)
- Nonlinear Algebra Seminar Online, Max-Planck Institut Leipzig
  *Chirality from Multiple Views* (2020)

- Algebra, Geometry, Combinatorics Seminar, San Francisco State University
  *Local Properties of Realization Spaces of Polytopes* (2019)
- Introduction to Algebraic Statistics by Bernd Sturmfels, Freie Universität Berlin
  *The Cone of Sufficient Statistics* (eingeladene Vorlesung, 2018)
- Seminar Algorithmische Algebra, Technische Universität Berlin
  *Quadratic Persistence of Real Projective Varieties* (2018)
- Seminar Diskrete Geometrie, Freie Universität Berlin
  *Matrix Completion Problems from the Geometric Point of View* (2017)
- Algebra Geometry Combinatorics Seminar, San Francisco State University
  *Positive Semidefinite Matrix Completion and Free Resolutions* (2017)
- Geometric and Topological Combinatorics Seminar, MSRI, Berkeley
  *Positive Semidefinite Matrix Completion and Free Resolutions* (2017)
- Nonlinear Algebra Seminar, Max-Planck Institut Leipzig
  *Positive Semidefinite Matrix Completion and Sums of Squares* (2017)
- Kolloquium Methods for Discrete Structures, FU Berlin
  *Positive Semidefinite Matrix Completion* (2017)
- Computational Algebra Seminar an der NCSU, Raleigh, NC
  *Pythagoras Number of Real Projective Varieties* (2017)
- TU Eindhoven
  *Geometry of Sums of Squares* (2017)
- TU Berlin
  *Geometry of Sums of Squares* (2017)
- Trends in Optimization Seminar, University of Washington, Seattle, WA
  *Positive semidefinite matrix completion and sums of squares* (2016)
- Seminar Diskrete Geometrie, FU Berlin
  *Geometry of Sums of Squares* (2016)
- Combinatorics Seminar, University of Miami, Miami, FL
  *Positive semidefinite matrix completion and free resolutions* (2016)
- Algebraic Geometry Seminar, University of Illinois, Urbana-Champaign, IL
  *Sums of Squares on Projective Varieties* (2016)
- Algebra Seminar, Osnabrück
  *Positive Semidefinite Matrix Completion, Sums of Squares, and Free Resolutions* (2016)
- Oberseminar Reelle Geometrie und Algebra, Konstanz
  *Low-Rank Sum-of-Squares Representations on Varieties of Minimal Degree* (2016)
- Algebra Seminar, Emory University, Atlanta, GA
  *Matrix Competion and Free Resolutions* (2016)
- Geometry Seminar Texas A&M, College Station, TX
  *Matrix Completion and Small Schemes* (2016)

---

- Colloquium an der Georgia Southern, Statesboro, GA
  *Sums of Squares and Projective Varieties* (2015)
- Oberseminar Reelle Geometrie und Algebra, Konstanz
  *Generic Spectrahedral Shadows* (2015)
- Oberseminar Diskrete Mathematik, Frankfurt
  *Generische Projizierte Spektraeder* (2015)
- Computational Algebra Seminar an der NCSU, Raleigh, NC
  *Generic Spectrahedral Shadows* (2015)

## VORTRÄGE BEI KONFERENZEN

- Squares in Dortmund
  *Graded Pythagoras Numbers* (2025)
- Combinatorial Synergies East
  *Adjoints in Positive Geometry* (2025)
- MFO Mini-Workshop "Alcoved Polytopes in Physics and Optimization"
  *Taking the amplituhedron to the limit* (2025)
- Rigidity in Action
  *Generic Rigidity and Statistics* (2024)
- SIAM Conference on Applied Algebraic Geometry, Minisymposium "Nonlinear Algebra in Particle Physics"
  *Adjoints of Amplituhedra* (2023)
- FoCM 2023
  *Adjoints of Polypols* (2023)
- MFO Workshop "New Directions in Real Algebraic Geometry"
  *Two View Chiral Reconstructions and Real Cubic Surfaces* (2023)
- MFO Workshop "Real Algebraic Geometry with a View toward Koopman Operator Methods"
  *Positivstellensätze: A survey* (2023)
- MTNS 2022, Invited Session on Moment Problems, Convex Algebraic Geometry, and Semidefinite Relaxations
  *Hyperbolic Secant Varieties of M-Curves* (2022)
- Minisymposium on Lattice Polytopes, online
  *$h^*$-Vectors of Alcoved Lattice Polytopes* (2022)
- POEMA 4th Workshop, online
  *Sums of Squares and Projective Geometry* (2022)
- Numerical and Probabilistic Nonlinear Algebra, MPI Leipzig
  *Image Reconstruction and Chirality in Computer Vision* (2021)
- Degeneracy Loci and Applications, online
  *Spectrahedra* (2021)
- POEMA 2nd Workshop, online
  *Kippenhahn's Theorem for Joint Numerical Ranges* (2020)

- Workshop Computational Algebra 2020, online
  *Realization Spaces of Polytopes* (2020)
- Opening Conference des Thematic Einstein Semesters Algebraic Geometry, Berlin
  *Sums of Squares and Projective Varieties* (2019)
- ICCOPT, Berlin
  *Kippenhahn's Theorem in Higher Dimensions* (2019)
- SIAM Conference on Applied Algebraic Geometry, Bern, Schweiz
  *Real Geometry of Matrix Completion* (2019)
- BIRS Workshop Geometry of Real Polynomials, Convexity and Optimization, Banff, Kanada
  *Kippenhahn's Theorem for the Joint Numerical Range* (2019)
- Geometry of Polynomials Boot Camp, Simons Institute for the Theory of Computing, Berkeley, CA
  *Hyperbolic Polynomials and Determinantal Representations I and II* (2019)
- Symposium on Discrete Mathematics, TU Graz, Österreich
  *Graph invariants from positive semidefinite matrix completion* (2018)
- GDMV 2018, Paderborn
  Sektion Diskrete Mathematik und Computeralgebra
  *Matrixvervollständigung vom geometrischen Standpunkt* (2018)
- Geometrietag 2017, Magdeburg
  *Quadratic Persistence of Projective Varieties* (2017)
- BMS-BGSMath Keynote Lecture, Barcelona
  *Extension Complexity and the Matching Polytope* (2017)
- SIAM Conference on Applied Algebraic Geometry
  Minisymposium Convex Algebraic Geometry and Semidefinite Optimization
  *Sum-of-Squares Representations of Shortest Length* (2017)
- Oberwolfach Workshop Real Algebraic Geometry with a View Toward Moment Problems and Optimization, Oberwolfach
  *Sums of Squares on Projective Varieties* (2017)
- Joint Mathematics Meeting, Atlanta, GA
  Special Session on Gaussian Graphical Models and Combinatorial Algebraic Geometry
  *Positive Semidefinite Matrix Completion and Algebraic Geometry* (2017)
- Harmony of Real and Complex Algebraic Geometry, Daejeon, Südkorea
  *Matrix Completion and Free Resolutions I & II* (2016)
- AMS Sectional Meeting, Raleigh, NC
  Special Session on Applied Algebraic Geometry
  *More on the Geometry of Positive Semidefinite Matrix Completion* (2016)
- ALaNT 4, Telč, Tschechien
  *Sums of Squares and Positive Semidefinite Matrix Completion* (2016)

- GOAL Workshop, Paris, Frankreich
  *Gaussian Graphical Models and Regularity* (2016)
- Applied Algebra Days 3, Madison, WI
  *Sums of Squares and Maximum Likelihood Estimation* (2016)
- AMS Sectional Meeting, Fargo, ND
  Special Session on Combinatorial Ideals and Applications
  *Matrix Completion, Free Resolutions, and Sums of Squares* (2016)
- AMS Sectional Meeting, Athens, GA
  Special Session on Discrete and Applied Algebraic Geometry
  *Low rank psd lifts of nonnegative quadratic forms* (2016)
- Joint Mathematics Meeting, Seattle, WA
  Special Session on Nonlinear Algebra
  *Real Rank with Respect to Varieties* (2016)
- Algebra, Geometry, and Proofs in Symbolic Computation, Fields Institute, Toronto, Kanada
  *Sums of Squares on Projective Varieties* (2015)
- Ordered Algebraic Structures and Related Topics, CIRM Workshop, Luminy, Frankreich
  *Gram Spectrahedra* (2015)
- Third Workshop on Hybrid Methodologies for Symbolic-Numeric Computation (embedded meeting of ICIAM 2015), Beijing, China
  *Algebraic Boundaries of Convex Sets* (2015)
- SIAM Conference on Applied Algebraic Geometry, Daejeon, Südkorea
  *Generic Spectrahedral Shadows* (2015)
- Nonlinear Algebra, Berlin
  *Gram Spectrahedra* (2015)
- Optimization and Algebraic Geometry, Daejeon, Südkorea
  *Extreme Rays of the Hankel Spectrahedra for Ternary Forms* (2014)
- Polyhedra, Lattices, Algebra and Moments, Singapur
  *Extreme Rays of Cones of Moment Matrices for Ternary Forms (2014)*
- SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO
  *Algebraic Boundaries of Convex Semi-algebraic Sets* (2013)
- SIAM Conference on Applied Algebraic Geometry, Raleigh, NC
  *The Algebraic Boundary of SO(2)-Orbitopes* (2011)
- Real Algebraic Geometry, Rennes, Frankreich
  *SO(2)-Orbitopes* (2011)
- Real Algebra, Geometry and Convexity, Leipzig
  *SO(2)-Orbitopes* (2011)

ORGANISATION

- "Wachspress Geometry" — zweitägiger Workshop im Rahmen des SPP Combinatorial Synergies mit Martin Winter in Leipzig (2024)

---

- Sommerschule "Real Algebraic Geometry and Hodge Theory" mit Mario Kummer in Dresden (2024)
- MEGA 2024 (Mitglied im local organizing committee, Leipzig 2024)
- Minisymposia "Real Algebraic Geometry and Optimization" (mit Greg Blekherman) und "Real Algebraic Geometry" (mit Daniele Agostini und Mario Kummer) während SIAM Conference on Applied Algebraic Geometry 2023, in Eindhoven, Niederlande (2023)
- Dresden Leipzig Seminar Algebra und Geometrie, Tagesworkshop UL (2023)
- Minisymposium „Convex Algebraic Geometry" während SIAM Conference on Applied Algebraic Geometry 2021, mit Greg Blekherman und Cynthia Vinzant, College Station, TX, USA (2021)
- Fall School des Thematic Einstein Semester on Algebraic Geometry - Varieties, Polyhedra, Computation, mit Daniele Agostini, Thomas Krämer, Marta Panizzut an der FU Berlin (2019)
- Real Applied Algebraic Geometry, mit Mario Kummer und Bernd Sturmfels an der TU Berlin (2019)
- Convexity Day am MPI Leipzig, mit Thomas Wannerer (2019)
- Minisymposium „Algebraic Methods for Convex Sets" während SIAM Conference on Applied Algebraic Geometry 2019, mit Greg Blekherman, Daniel Plaumann, Yong Sheng Soh und Dogyoon Song in Bern, Schweiz (2019)
- Besuch von Rekha Thomas als Gast des Graduiertenkollegs Facets of Complexity an der FU Berlin (Juni 2019)
- Berlin-Leipzig Seminar on Algebra, Geometry, and Combinatorics Zweitägige Konferenz an der FU Berlin, mit Christian Haase (2017)
- Reading Group on Real Algebraic Geometry, mit Mario Kummer und Kristin Shaw, am MPI Leipzig (2017)
- Joint Mathematics Meeting in Atlanta, GA
  Special Session on Gaussian Graphical Models and Combinatorial Algebraic Geometry (2017)
- Minisymposium "Polynomial Optimization and Moments" während SIAM Conference on Applied Algebraic Geometry 2015 in Daejeon, Südkorea

## Lehre

REU (Research Experiences for Undergraduates) in Leipzig 2022 und 2024

### Vorlesungen
- Algebra 1 (U Leipzig 2024/25)
- Kombinatorik (U Leipzig 2024)
- Lineare Algebra II (U Leipzig 2024)
- Reelle Algebra (U Leipzig 2023/24)
- Lineare Algebra I (U Leipzig 2023/24)

- Algebraische Geometrie II: Schnitttheorie (U Leipzig 2023)
- Algebraische Geometrie (U Leipzig 2022/23)
- Algebra II (U Leipzig 2022)
- Algebra I (U Leipzig 2021/22)
- Reelle Algebra und Geometrie (U Leipzig 2021)
- Lineare Algebra II (U Leipzig 2021)
- Riemannsche Flächen und algebraische Kurven (U Leipzig 2020/21)
- Lineare Algebra I (U Leipzig 2020/21)
- Lineare Algebra II (FU Berlin 2020)
- Lineare Algebra I (FU Berlin 2019/20)
- Mathematisches Panorama/Panorama der Mathematik (FU Berlin 2018/19)
- Diskrete Geometrie III (FU Berlin 2018/19)
- Diskrete Geometrie II (FU Berlin 2018)
- Diskrete Geometrie I (FU Berlin 2017/2018)
- MATH-4150 Introduction to Number Theory (GT 2017)
- MATH-8803-sin Algebraic Curves (GT 2016)
- MATH-2552 Differential Equations (GT 2016)
- MATH-1552 Integral Calculus (GT 2015)
- MATH-4150 Introduction to Number Theory (GT 2015)
- MATH-2403 Differential Equations (GT 2014)

**Seminare**
- Seminar (Lehramt) (U Leipzig 2024/25)
- Seminar zur Schulmathematik (Lehramt): Elementarmathematik vom höheren Standpunkt (U Leipzig 2023/24)
- Seminar Computeralgebra (U Leipzig, 2022/23)
- Seminar zur Schulmathematik (Lehramt): Buch der Beweise (U Leipzig 2021/22)
- Seminar Themen in Algebra und Geometrie (U Leipzig 2021/22)
- Seminar Real Algebraic Geometry and Optimization (FU Berlin 2019)
- Proseminar Panorama der Mathematik (Storytelling in der Mathematik) (FU Berlin 2019)
- Themen aus der Zahlentheorie und algebraischen Geometrie (Konstanz 2010/2011)

**Sommerschulen**
- Summer School on Hyperbolic Polynomials, Sums of Squares, and Optimization, Georgia Institute of Technology, mit Greg Blekherman, Daniel Plaumann und Cynthia Vinzant (2018)
- Summer School on Real Algebraic Geometry and Optimization, Georgia Institute of Technology, mit Greg Blekherman und Mauricio Velasco (2016)

---

## SERVICE

- Erasmus-Beauftragter der Fakultät Mathematik und Informatik, Uni Leipzig (2023-)
- Gutachten: Alexander von Humboldt Stiftung, verschiedene Zeitschriften (unter anderem Adv. Math., DCG, IMRN, Journal of Algebra, Linear and Multilinear Algebra, SIOPT, SIAGA)
- Gremienarbeit: Tutorenauswahlkommission (FU Berlin; Juni 2018 bis September 2020), Besetzungskommissionen (für zwei Postdoc-Stellen), BMS Committee (Oktober 2019 bis September 2020), Einstellungskommission für Postdocs in der Nonlinear Algebra Gruppe am MPI MiS in Leipzig (2020, 2021, 2022, 2023)

## KONFERENZTEILNAHMEN (AUSWAHL)

- Rigidity in Action, Linz, Österreich (2024)
- Combinatorial Coworkspace 2024, Hirschegg, Österreich (2024)
- Positive Geometry in Particle Physics and Cosmology, MPI MiS Leipzig (2024)
- Current Topics in Fundamental Physics, Benediktbeuern, Bayern (2023)
- SIAM Conference on Applied Algebraic Geometry 2023, Eindhoven, Niederlande (2023)
- FoCM 2023, Paris, Frankreich (2023)
- Oberwolfach Workshop "New Directions in Real Algebraic Geometry" (2023)
- Oberwolfach Workshop "Real Algebraic Geometry with a View toward Koopman Operator Methods" (2023)
- SIAM Conference on Applied Algebraic Geometry, College Station, TX, USA (2021)
- Oberwolfach Workshop „Real Algebraic Geometry with a View toward Hyperbolic Programming and Free Probability (2020)
- SIAM Conference on Applied Algebraic Geometry, Bern, Schweiz (2019)
- BIRS Workshop Geometry of Real Polynomials, Convexity and Optimization, Banff, Kanada (2019)
- Simons Workshops Geometry of Polynomials (2019)
- SIAM Conference on Applied Algebraic Geometry, Atlanta (2017)
- Real Algebraic Geometry with a View Toward Moment Problems and Optimization, Oberwolfach Workshop (2017)
- Joint Mathematics Meeting in Atlanta, Georgia (2017)
- Joint Mathematics Meeting in Seattle, Washington (2016)
- Algebra, Geometry, and Proofs in Symbolic Computation, Fields Institute, Toronto, Kanada (2015)
- Ordered Algebraic Structures and Related Topics, CIRM Workshop, Luminy, Frankreich (2015)

- Algebraic Vision, Berlin (2015)
- SIAM Conference on Applied Algebraic Geometry, Daejeon, Südkorea (2015)
- Real Algebraic Geometry with a View to Systems Control and Free Positivity, Oberwolfach (2014)
- SIAM Conference on Applied Algebraic Geometry, Fort Collins, Colorado (2013)
- Workshop Polynomial Optimisation, Isaac Newton Institute, Cambridge, UK (2013)
- Structured Function Systems and Applications, Oberwolfach (2013)
- SIAM Conference on Applied Algebraic Geometry, Raleigh, North Carolina (2011)
- Real Algebraic Geometry, Rennes, Frankreich (2011)
- BIRS Workshop Convex Algebraic Geometry, Banff, Kanada (2010)

SPRACHEN

    Deutsch (Muttersprache)
    Englisch (fließend)
    Französisch (gut)

POSTADRESSE

    Prof. Dr. Rainer Sinn
    Universität Leipzig
    Mathematisches Institut
    PF 10 09 20
    D-04009 Leipzig

ANSCHRIFT

    Prof. Dr. Rainer Sinn
    Universität Leipzig
    Mathematisches Institut
    Fakultät Mathematik und Informatik
    Neues Augusteum
    Augustusplatz 10
    D-04109 Leipzig

    Telefon: 0341 97 32164