Curriculum Vitae Dr Johannes Schmitt

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Profile

- Currently Postdoc in the working group algebra at Ruhr-Universität Bochum
- PhD (Dr. rer. nat.) as well as MSc and BSc in Mathematics
- Research interests: Algebraic geometry, representation theory, computer algebra, symplectic reflection groups, Cox rings, constructive invariant theory

Employment & Education

- **since October 2024:** Research associate ('wissenschaftlicher Mitarbeiter') at Ruhr-Universität Bochum
- **October 2023 – September 2024:** Research associate ('wissenschaftlicher Mitarbeiter') at University of Siegen
- **April 2023 – September 2023:** Research associate ('wissenschaftlicher Mitarbeiter') at RPTU Kaiserslautern-Landau
- **November 2019 – July 2023:** PhD student in Mathematics at RPTU Kaiserslautern-Landau
  Thesis: *On $\mathbb{Q}$-factorial terminalizations of symplectic linear quotient singularities*, supervised by Prof. Dr. Ulrich Thiel
  Date of defence: 14 July 2023
- **April 2020 – March 2023:** Teaching assistant at RPTU Kaiserslautern-Landau
  Organization and teaching of Bachelor's and Master's level example classes, occasional substitution of the lecturer in lectures
- **September 2017 – October 2019:** Master of Science in Mathematics at TU Kaiserslautern
  Thesis: *On a Theorem of Eichler*, supervised by Jun.-Prof. Dr. Tommy Hofmann
  Specialization: Algebra and number theory
- **February 2017 – September 2019:** Research assistant at TU Kaiserslautern
  Implementation of number theoretic algorithms in the software package Hecke, including algorithms for the computation of maximal orders, Picard groups, and locally free class groups.

- **October 2014 – August 2017:** Bachelor of Science in Mathematics at TU Kaiserslautern
  Thesis: *Lineare Algebra über Polynomringen*, supervised by Jun.-Prof. Dr. Tommy Hofmann
  Specialization: Algebra, geometry, and computeralgebra

- **June 2014:** Abitur ('high school degree')

Peer-reviewed publications

- *The class group of a minimal model of a quotient singularity*, Bull. Lond. Math. Soc. **56** (2024), no. 9, 2777–2793.

- *On parabolic subgroups of symplectic reflection groups*, with G. Bellamy and U. Thiel, Glasg. Math. J. **65** (2023), no. 2, 401–413.

- *Towards the classification of symplectic linear quotient singularities admitting a symplectic resolution*, with G. Bellamy and U. Thiel, Math. Z. **300** (2022), no. 1, 661–681.

PhD thesis

- *On $\mathbb{Q}$-factorial terminalizations of symplectic linear quotient singularities*, PhD thesis, RPTU Kaiserslautern-Landau, 2023.

Other publications (expository articles, etc.)

- *Invariant Theory*, with W. Decker, L. Ramesh. In: W. Decker, C. Eder, C. Fieker, M. Horn, M. Joswig (eds), *The Computer Algebra System OSCAR*, Algorithms and Computation in Mathematics, vol. 32, Springer Cham, 2025.

- *Coinvariants of pseudo-reflection groups*, Computeralgebra Rundbrief, **74** (2024), 23–29.

- *Algebraic and geometric computations in OSCAR*, with M. Belotti, M. Joswig, C. Meroni, V. Schleis, SIAM News, **56** (2023), no. 7, 9–10.

Preprints

- *Homogeneous Khovanskii bases and MUVAK bases*, 2024, preprint, `https://arxiv.org/abs/2409.01146`

Talks

- June 2025: *On the algorithmic construction of symplectic resolutions of quotient singularities.* Spring School Group Actions and Symplectic Singularities (Université de Lille)

- May 2025: *Towards the computation of minimal models of symplectic quotient singularities.* Oberseminar Algebra, Zahlentheorie und Diskrete Mathematik (Leibniz Universität Hannover)

- November 2024: *Symplectic reflection groups.* Oberseminar Combinatorial Synergies (Ruhr-Universität Bochum)
- January 2024: *Symplectic reflections and quotient singularities.* Oberseminar Arrangements and Symmetries (Ruhr-Universität Bochum)
- April 2023: *On $\mathbb{Q}$-factorial terminalizations of symplectic linear quotient singularities.* Oberseminar Algebra (Friedrich-Schiller-Universität Jena)
- November 2022: *Computing Cox rings of linear quotients in OSCAR.* Nikolaus school 'Computational Geometry' (Fraunhofer Institute ITWM, Kaiserslautern)
- September 2022: *Towards the classification of symplectic linear quotient singularities admitting a symplectic resolution.* Retreat of the SFB-TRR 191 (University of Bochum)
- September 2022: *OSCAR case studies: Computing Cox rings of linear quotients in OSCAR.* Sixth annual conference of the SFB-TRR 195 (Eberhard Karls Universität Tübingen)
- August 2022: *Towards the classification of symplectic linear quotient singularities admitting a symplectic resolution.* A Day of Geometry in Glasgow (University of Glasgow)
- March 2022: *On the computation of Cox rings of minimal models of symplectic linear quotients.* Retreat of the SFB-TRR 195 (TU Kaiserslautern)
- December 2021: *On parabolic subgroups of symplectic reflection groups.* Nikolaus conference 2021 (RWTH Aachen University)
- September 2021: *Towards the classification of symplectic linear quotient singularities admitting a symplectic resolution.* Fifth annual conference of the SFB-TRR 195 (TU Kaiserslautern)

Awards & Grants

- June 2024: Dissertation award of the 'Freundeskreis der RPTU in Kaiserslautern'
- June 2022: Research Support Fund of the Edinburgh Mathematical Society to support a research visit to the University of Glasgow in August 2022

Participation in workshops and summer schools

- June 2025: Spring school 'Group actions and symplectic singularities' (Université de Lille)
- March 2023: Spring school 'Real, complex, and symplectic reflection groups' (University of Bochum)
- November 2022: Nikolaus school 'Computational Geometry' (Fraunhofer Institute ITWM, Kaiserslautern)

- September 2022: 'Young group theorists workshop: exploring new connections' (SwissMAP Research Station, Les Diablerets)
- April 2022: Research school 'Symplectic singularities in geometry and representation theory' (CIRM Luminy)
- October 2021: Block seminar on representation theory and algebraic groups, IRTG of the SFB-TRR 195 (TU Kaiserslautern)

Teaching

- **Seminars:**
  - Hyperebenenarrangements ('Hyperplane arrangements', Winter 24/25, in German)
  - Quadratische Zahlkörper ('Quadratic number fields', Summer 24, in German)
- **Course assistance:**
  - Einführung in die Theorie der Matroide ('Introduction to the theory of matroids', Summer 25, in German)
  - Algebra I (Winter 24/25, in German)
  - Einführung in das Symbolische Rechnen ('Introduction to symbolic computing', Summer 23, in German)
  - Algebraic Geometry (Winter 22/23, in English)
  - Cryptography (Summer 21 and Summer 22, in English)
  - Commutative Algebra (Winter 20/21 and Winter 21/22, in English)
  - Computeralgebra (Summer 20, in English)

Further skills

- Advanced programming experience in the programming language Julia and the computer algebra system OSCAR (including major contributions), intermediate programming experience in the computer algebra systems Magma, GAP, and Singular