

# 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 singularities, 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.

#### Preprints

- ♦ *Invariants in the cohomology of the complement of quaternionic reflection arrangements*, with L. Giordani and G. Röhrle, 2025, arXiv:2510.27311
- ♦ *Homogeneous Khovanskii bases and MUVAK bases*, 2024, arXiv:2409.01146

#### 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 and 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 and V. Schleis, SIAM News, **56** (2023), no. 7, 9–10.

## Talks

- ◆ December 2025: *Invariants in the cohomology of the complement of quaternionic reflection arrangements*. Nikolaus Conference 2025 (RWTH Aachen University)
- ◆ 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 (Ruhr-Universität 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’ (Ruhr-Universität 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

### ◆ Course assistance:

- ◇ Lineare Algebra und Geometrie I (‘Linear algebra and geometry I’, Winter 25/26, in German)
- ◇ 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)

### ◆ Seminars:

- ◇ Hyperebenenarrangements (‘Hyperplane arrangements’, Winter 24/25, in German)
- ◇ Quadratische Zahlkörper (‘Quadratic number fields’, Summer 24, in German)

### **Programming skills**

- ♦ Major contributions to the computer algebra system OSCAR
- ♦ Intermediate programming experience in the computer algebra systems Magma, GAP, Singular, and Sage