

# CURRICULUM VITAE

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## Degrees and Qualifications.

- December 2023: Docent in Mathematics, Uppsala University, Sweden.<sup>1</sup>
- May 2015: Ph.D. in Mathematics, Uppsala University. Thesis: A Categorical Study of Composition Algebras via Group Actions and Triality. Advisor: Prof. Ernst Dieterich.
- December 2012: Ph.Lic. in Mathematics, Uppsala University. Thesis: On Finite-Dimensional Absolute Valued Algebras.
- June 2010: M.Sc. in Mathematics, Uppsala University. Thesis: Generalisations of the Algebraic Theory of Connective Segmentation.
- June 2008: B.Sc. in Physics, Uppsala University. Thesis: Complex Geometry.

## Positions.

- Since August 2020: Senior Lecturer/Associate Professor, Department of Mathematics, Uppsala University, Sweden.
- September 2018 – July 2020: Postdoctoral Fellow, Department of Mathematical and Statistical Sciences, University of Alberta, Canada.
- September 2016 – August 2018: KAW Postdoctoral Fellow, Institut Camille Jordan, Université Claude Bernard Lyon 1, France.
- August 2015 – August 2016: Visiting Lecturer, Department of Mathematical Sciences, Chalmers University of Technology and the University of Gothenburg, Sweden.
- July 2010 – June 2015: Doctoral Student, Department of Mathematics, Uppsala University, Sweden.
- July 2006 – December 2009: Teaching Assistant and Teacher, Department of Mathematics, Uppsala University, Sweden.

## Distinctions and Awards.

- Appointed Distinguished University Teacher (excellent lärare) at the Faculty of Science and Technology, 2022.
- Receptient of the Distinguished Teaching Award in mathematics, science and technology, awarded by the Vice-Chancellor of Uppsala University, 2021.
- Receptient of the Pedagogical Award of the Uppsala Union of Engineering and Science Students, 2020.

## Research.

### *Publications.*

- (13) Groups of type  $E_6$  and  $E_7$  over Rings via Brown Algebras and Related Torsors. Special Issue in Memory of Jacques Tits, *J. Algebra* 656, 24-46 (2024). [Link Preprint](#)
- (12) Albert Algebras over Rings and Related Torsors. *Canad. J. Math.* 73, 875-898 (2021). [Link Preprint](#)

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<sup>1</sup>The Swedish docentship is based on the research and teaching done after the PhD, and can be compared to habilitation in some other traditions.

- (11) (With V. Chernousov and A. Pianzola) On the Tits–Weiss conjecture and the Kneser–Tits conjecture for  $E_{7,1}^{78}$  and  $E_{8,2}^{78}$  (with an appendix by R. M. Weiss). *Forum Math. Sigma* 9, 25pp (2021). [Link](#) [Preprint](#)
- (10) (With V. Chernousov and A. Pianzola)  $R$ -triviality of Groups of Type  $F_4$  Arising from the First Tits Construction. *Bull. London Math. Soc.* 53, 535–547 (2021). [Link](#) [Preprint](#)
- (9) (With A. Pianzola) On the Classification of Lie Bialgebras by Cohomological Means. *Doc. Math.* 24, 2583–2612 (2019). [Link](#) [Preprint](#)
- (8) (With P. Gille) Isotopes of Octonion Algebras,  $\mathbf{G}_2$ -Torsors and Triality. *Adv. Math.* 343, 864–909 (2019). [Link](#) [Preprint](#)
- (7) (With A. Stolin) Lie Bialgebras, Fields of Cohomological Dimension at Most 2 and Hilbert’s Seventeenth Problem. *J. Algebra* 476 (2017), 368–394. [Link](#) [Preprint](#)
- (6) Composition Algebras and Outer Automorphisms of Algebraic Groups via Triality. *Comm. Algebra* 45 (2017), 2401–2416. [Link](#) [Preprint](#)
- (5) Classification of the Finite-Dimensional Real Division Composition Algebras having a Non-Abelian Derivation Algebra. *J. Algebra* 445 (2016), 35–77. [Link](#) [Preprint](#)
- (4) An Approach to Finite-Dimensional Real Division Composition Algebras through Reflections. *Bull. Sci. Math.* 139 (2015), 357–399. [Link](#)
- (3) Corestricted Group Actions and Eight-Dimensional Absolute Valued Algebras. *J. Pure Appl. Algebra* 219 (2015), 1519–1547. [Link](#)
- (2) Morphisms in the Category of Finite-Dimensional Absolute Valued Algebras. *Colloq. Math.* 125 (2011), 147–174. [Link](#)
- (1) (With J. Serra) Connective Segmentation Generalized to Arbitrary Complete Lattices. In: P. Soille, M. Pesaresi, and G. K. Ouzounis (Eds.): *ISMM 2011, LNCS 6671* (2011), 61–72. [Link](#)

*Selected Invited Conference Talks.*

- (6) *Algebras with Additional Structures via Torsors and Descent*. Special Session on Descent Methods in Algebra, Geometry and Topology at the Canadian Mathematical Society’s Summer Meeting, St John’s, NL, Canada, 2022.
- (5) *Exceptional Symmetry*. The pursuit of symmetry: a conference in honour of the 80th birthday of Robert V. Moody (hybrid conference). Fields Institute, Toronto, ON, Canada, 2022.
- (4) *On the Classification of Quantum Groups by Descent and Cohomology*. Special Session on Lie Representation Theory at the AMS Fall Central Sectional Meeting, Madison, WI, USA, 2019.
- (3) *Exceptional Groups and Related Algebras*. Algebraic groups: Geometry, Actions and Structure, Lyon, France, 2018.
- (2) *Octonion Algebras with Isometric Quadratic Forms over Rings, via Triality*. Quadratic Forms and Related Structures over Fields, MFO, Oberwolfach, Germany, 2018.
- (1) *Lie Bialgebras from a Cohomological Viewpoint*. Lie Theory, Cohomology and Geometry in Wildrose Country; a workshop in honour of Vladimir Chernousov and Arturo Pianzola, Edmonton, AB, Canada, 2017.

*Selected Invited Seminar Talks.*

- (5) *Torsors under exceptional groups*. Quadratic forms, linear algebraic groups and beyond (online seminar series), 2021.
- (4) *Exceptional Groups and Exceptional Algebras*. University of British Columbia, Vancouver, BC, Canada, 2019.
- (3) *Octonion Algebras via  $\mathbf{G}_2$ -torsors and triality*. Bar-Ilan University, Ramat-Gan, Israel, 2018.
- (2) *Algèbres d’octonions,  $\mathbf{G}_2$ -torseurs et trialité*. Institut Mathématique de Jussieu, Paris, France, 2018, and Institut Fourier, Grenoble, France, 2017.
- (1) *Groupes quantiques, bigèbres de Lie, cohomologies, et le 17e problème d’Hilbert*. Institut de mathématiques de Bourgogne, Dijon, France, 2017.

*Organization of Conferences.*

- Co-organizer of the workshop Algebraic Groups in a Broad Sense, Stockholm, Sweden, 2024.
- Co-organizer of the special session Non-Commutative Algebra, Meeting of the Catalan, Spanish, Swedish Math Societies, Umeå, Sweden, 2017.
- Member of the organizing committee, Quantum Algebras, Quantum Integrable Models and Quantum Information, satellite conference to the 7<sup>th</sup> European Congress of Mathematics, Kristineberg, Sweden, 2016.

*Selected Grants and Scholarships.*

- Grant for a post-doctoral position (2 years) abroad from the Knut and Alice Wallenberg Foundation, 100 000 EUR, 2016.
- Grant from the G S Magnuson Foundation via the Royal Swedish Academy of Sciences, 1100 EUR, 2015.

**Teaching.***Courses taught at Uppsala University.*

PhD level course, taught in English as lecturer:

- Algebraic groups, 7.5 credits, 2023 (jointly with M. Jeannin).

Master level courses, taught in English, as course responsible teacher:

- Commutative algebra and algebraic geometry, 10 credits, 2023 and 2021.
- Modules and homological algebra, 10 credits, 2021.

Undergraduate courses, taught in Swedish, as course responsible teacher or as main lecturer:

- Single variable calculus, 10 credits, 2025, 2024, 2023, 2022 and 2021.
- Linear algebra and geometri I, 5 credits, 2024.
- Algebra and geometry, 5 credits, 2024, 2021 and 2020.
- Linear algebra II, 5 credits, 2023, 2022, 2021 and 2020.
- Linear algebra III, 5 credits, 2015.
- Algebra II, 5 credits, 2014 and 2013.
- Algebra I, 5 credits, 2011 and 2009.
- Calculus for engineers, 10 credits, 2010.

*Courses taught at the University of Alberta.*

Undergraduate courses, taught in English, as course responsible teacher or as lecturer:

- Graph Theory, 6 credits, 2020 and 2019.
- Calculus for the Physical Sciences, 6 credits, 2019.
- Elementary Calculus, 6 credits, 2018.

*Courses taught at Chalmers University of Technology.*

Undergraduate courses, taught in Swedish, as course responsible teacher:

- Mathematics D for the Preparatory Year, 10.5 credits, 2016.
- Linear Algebra, 7.5 credits, 2016.
- Discrete Mathematics, 7.5 credits, 2015.
- Mathematics for Marine Engineers 1, 2015.

*Course taught at the University of Gothenburg.*

PhD level course, taught in English, as lecturer:

- Lie Algebras and Bialgebras, 4 credits, 2016 (jointly with A. Stolin).

**Advisorship.***PhD student at Uppsala University, as main advisor.*

- I. Sundelius, PhD thesis in Mathematics within the Centre for Interdisciplinary Mathematics, ongoing since 2024.

*PhD student at Uppsala University, as co-advisor.*

- J. Lindell, PhD thesis in Mathematics, ongoing since 2022.

*MSc students at Uppsala University, as main advisor.*

- V. Hildebrandsson, *Octonion algebras over schemes and the equivalence of isotopes and isometric quadratic forms*. MSc Thesis in Mathematics, 30 credits, 2022-2023.
- H. Ali, *Exceptional groups and their generators*. MSc Thesis in Mathematics, 30 credits, 2022.

*Undergraduate students at Uppsala University, as main advisor.*

- H. Sundgren, *Elementary proof of the Riemann–Roch Theorem*. BSc thesis in Mathematics, 15 credits, 2023.
- F. Wredh, *Impossible constructions within Euclidean geometry*. Degree project in mathematics, 15 credits, 2022.
- E. Johansson Melin, *Hurwitz 1-,2-,4-,8-sats*. Degree project in mathematics, 15 credits, 2021.
- V. Löfgren, *Al-Khwarizmi och den arabiska matematiken*. Degree project in mathematics, 15 credits, 2021.
- A. Kronsjö, *Hurwitz 1,2,4,8-sats*. Degree project in mathematics, 15 credits, 2013.
- K. Lilja, *Kvaternioner — algebraiska och geometriska aspekter*. Degree project in mathematics, 15 credits, 2013.

### **Pedagogical Training.**

- Pedagogical mentorship Course, 1 week, Uppsala University, 2023.
- Supervising PhD students, 3 weeks, Uppsala University, 2023.
- Teaching and assessing academic writing, 2 days, Uppsala university, 2022.
- Scholarly teaching in science and technology, 2 weeks, Uppsala university, 2020.
- Instructor training workshop, 2 days, University of Alberta, 2018.
- Supervising written assignments and degree projects, 3 weeks, University of Gothenburg, 2016.
- Academic teacher training course, 5 weeks, Uppsala University, 2013.

### **Outreach.**

- Since January 2024: member of Svenska kommittén för matematikutbildning (the Swedish Committee for Mathematical Instruction, a sub-organization of the National Committee for Mathematics at the Royal Swedish Academy of Sciences).
- Kvaternioner [Quaternions], lecture for high school students, Fönster mot naturvetenskap, the University of Gothenburg, Sweden, October 2015.
- Tal i högre dimensioner [Numbers in Higher Dimensions], public lecture, SciCafé Uppsala, Sweden, April 2015.

### **Appointments and Board Participation.**

- Since September 2022: member of the Council for Educational Development at the Faculty of Science and Technology (TUR), Uppsala University.
- October 2010 – June 2011: Member of the Faculty Board, Faculty of Science and Technology, Uppsala University.
- September 2010 – December 2011: Member of the Equal Opportunities Workgroup, Department of Mathematics, Uppsala University.
- September 2010 – June 2011: Chair of the PhD Students' Council of the Faculty of Science and Technology, Uppsala University.