

# Martin Lüdtke

## Curriculum Vitae

 [m.w.ludtke@rug.nl](mailto:m.w.ludtke@rug.nl)

<https://martinluedtke.github.io>



### Mathematical Interests

**arithmetic geometry, rational points, non-abelian Chabauty, fundamental groups, section conjecture**

### Academic career

- Aug 2025– present **Minerva Fellow**, University of Oldenburg, in cooperation with Ben-Gurion University
- Feb–Jul 2025 **Postdoctoral Fellow**, Max Planck Institute for Mathematics, Bonn (Germany)
- 2021–2025 **Postdoctoral Researcher**, Rijksuniversiteit Groningen, Groningen (Netherlands)  
Research on non-abelian Chabauty in the group of Steffen Müller
- 2020–2021 **Postdoctoral Researcher**, Goethe-Universität, Frankfurt am Main (Germany)  
Research on anabelian geometry in the GAUS cluster Darmstadt/Frankfurt/Heidelberg  
(Geometry and Arithmetic of Uniformized Structures)
- 2015–2020 **PhD**, Goethe-Universität, Frankfurt am Main (Germany), magna cum laude  
Dissertation: *The  $p$ -adic section conjecture for localisations of curves*  
Advisor: Jakob Stix  
Date of defense: 14.12.2020
- 2013–2015 **M.Sc. in Mathematics**, Ruprecht-Karls-Universität, Heidelberg (Germany), 1.0  
Thesis: *Birational Anabelian Geometry of Curves over Algebraically Closed Fields*  
Advisor: Alexander Schmidt
- 2012–2013 **MASt in Mathematics**, University of Cambridge, Cambridge (UK), honours  
Part iii of the mathematical tripos  
Part iii essay: *The Grunwald–Wang Theorem*  
Advisor: Tom Fisher
- 2009–2012 **B.Sc. in Mathematics**, Ruprecht-Karls-Universität, Heidelberg (Germany), 1.0  
Thesis:  *$p$ -adic  $L$ -functions and Leopoldt's Conjecture*  
Advisor: Kay Wingberg
- 2000–2009 **High school**, Uhland-Gymnasium, Tübingen (Germany), 1.3

### Publications

- 2025 **Refined Chabauty–Kim computations for the thrice-punctured line over  $\mathbb{Z}[1/6]$**   
Res. Number Theory **11**, 24 (2025), ANTS XVI proceedings  
<https://doi.org/10.1007/s40993-024-00597-4>
- 2024 **Refined Selmer equations for the thrice-punctured line in depth two**  
(with A. Best, L. A. Betts, T. Kumpitsch, A. McAndrew, L. Qian, E. Studnia and Y. Xu)  
Math. Comp. **93** (2024), 1497–1527  
DOI: <https://doi.org/10.1090/mcom/3898>

- 2023 **Linear and quadratic Chabauty for affine hyperbolic curves**  
(with J. S. Müller and M. Leonhardt)  
Int. Math. Res. Not. IMRN **21** (2023), 18752–18780  
DOI: <https://doi.org/10.1093/imrn/rnab185>
- 2020 **The p-adic section conjecture for localisations of curves**  
Doctoral thesis at Goethe-Universität Frankfurt supervised by Jakob Stix  
URN: urn:nbn:de:hebis:30:3-574318
- 2018 **Birational Anabelian Geometry of Curves over Algebraically Closed Fields in Arbitrary Characteristic**  
Isr. J. Math. **227** (2018), 987–1011  
DOI: <https://doi.org/10.1007/s11856-018-1757-2>

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## Preprints

- 2025 **Affine Chabauty I**  
(with M. Leonhardt)  
<https://arxiv.org/abs/2511.15949>
- 2023 **Chabauty–Kim and the Section Conjecture for locally geometric sections**  
(with L. A. Betts and T. Kumpitsch), submitted  
<https://arxiv.org/abs/2305.09462>
- 2022 **Foundations of the nonabelian method of Chabauty**  
(with M. Kim)  
Lecture notes for Minhyong Kim's course at the Arizona Winter School 2020  
to be published in the AWS proceedings volume

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## Teaching

- 2024/25 **Lecturer Topics in Algebra and Geometry**, Groningen
- 2023 **Lecturer Group Theory**, Groningen
- 2022/23 **Lecturer Advanced Algebraic Structures**, Groningen, with S. Müller
- 2022 **Lecturer Group Theory**, Groningen, with P. Kılıçer
- 2021/22 **Security and Coding Theory**, Groningen, with P. Kılıçer and S. Müller
- 2021 **Seminar Central Simple Algebras**, Frankfurt, with J. Stix and T. Kumpitsch
- 2019/20 **TA Linear Algebra**, Frankfurt
- 2019 **TA Geometry and Algebra**, Frankfurt
- 2018/19 **TA Linear Algebra**, Frankfurt
- 2018 **TA Elementary Mathematics II**, Frankfurt
- 2018 **TA Foundations of Algebra**, Frankfurt
- 2017 **TA Seminar Proofs from the Book**, Frankfurt, with J. Stix
- 2015–2017 **Lead Coordinator of “Study centre”**, Frankfurt
- 2015 **Tutor Functional Analysis**, Heidelberg
- 2014/15 **Tutor Algebraic Geometry 1**, Heidelberg
- 2014 **Tutor Algebra 2**, Heidelberg
- 2013/14 **Tutor Algebra 1**, Heidelberg
- 2013 **STIMULUS Volunteer**, Long Road Sixth Form College, Cambridge

2012 Tutor Theoretical Computer Science, Heidelberg

2010/11 Tutor Practical Computer Science, Heidelberg

## Supervised students

2025 **Arif Batiray**

Bachelor project: *The number of roots of a random  $p$ -adic polynomial*

2022 **Niek Veltman**

Bachelor project: *Linear Relations for Multiple Zeta Values*

2021 **Leonie Scherer**

Bachelor thesis: *Galoistheorie nach Grothendieck* (2nd examiner)

## Refereeing

**Essential Number Theory**

**Indagationes Mathematicae**

**Expositiones Mathematicae**

**International Mathematics Research Notices**

## Talks

Oct 2025 **Arithmetic and Algebraic Geometry seminar at UvA**, Amsterdam  
Affine Chabauty

Sep 2025 **Arithmetic and Algebraic Geometry Week**, Iași  
Abel–Jacobi images in the generalised Jacobian

June 2025 **33ème Journées Arithmétiques**, Luxembourg  
Affine Chabauty I

May 2025 **AGNT seminar at Ben Gurion University**, Be'er Scheva (online)  
Refined Chabauty–Kim computations for the thrice-punctured line over  $\mathbb{Z}[1/6]$

May 2025 **GAUS Seminar**, Heidelberg  
Refined Chabauty–Kim computations for the thrice-punctured line over  $\mathbb{Z}[1/6]$

Apr 2025 **MPIM, Number Theory Lunch Seminar**, Bonn  
Refined Chabauty–Kim for the thrice-punctured line

Feb 2025 **Groningen/Oldenburg workshop on Geometry, Number Theory, Algorithms and Applications in Cryptography**, Groningen  
Refined Chabauty–Kim for the thrice-punctured line over  $\mathbb{Z}[1/6]$

Jan 2025 **Algebraic Geometry Seminar**, Utrecht  
Refined Chabauty–Kim for the thrice-punctured line over  $\mathbb{Z}[1/6]$

Oct 2024 **Algebraic and arithmetic geometry seminar**, Scuola Normale Superiore, Pisa  
Non-abelian Chabauty and the Selmer Section Conjecture

Oct 2024 **MFO workshop Anabelian Geometry and Representations of Fundamental Groups**, Oberwolfach  
Non-abelian Chabauty and the Selmer Section Conjecture

Jul 2024 **Algorithmic Number Theory Symposium (ANTS XVI)**, MIT  
Refined Chabauty–Kim computations for the thrice-punctured line over  $\mathbb{Z}[1/6]$

Mar 2024 **Algebraic Days of Gabon**, Libreville  
Fundamental groups in arithmetic and geometry (5 lectures with exercise sessions)

- Feb 2024 **Winter workshop Chabauty–Kim**, Heidelberg  
Linear and quadratic Chabauty for affine hyperbolic curves
- Feb 2024 **Winter workshop Chabauty–Kim**, Heidelberg  
Foundations of Chabauty–Kim (2 lectures and exercise session)
- Nov 2023 **Rational points consortium meeting**, Utrecht  
Rational points and the étale fundamental group
- Jun 2023 **Intercity Number Theory Seminar**, Amsterdam  
Chabauty–Kim and the locally geometric section conjecture
- May 2023 **Online seminar on Selmer schemes organised by M. Kim**  
Mixed Tate Selmer schemes beyond the polylog quotient
- Jan 2023 **AGNT seminar at Ben Gurion University**, Be'er Scheva (online)  
Non-abelian Chabauty for the thrice-punctured line and the Selmer section conjecture
- Nov 2022 **GAUS seminar**, Heidelberg  
Non-abelian Chabauty for the thrice-punctured line and the Selmer section conjecture
- Oct 2022 **Junior Algebraic Geometry Seminar**, Leiden  
Non-abelian Chabauty for the thrice-punctured line
- Oct 2022 **Groningen/Oldenburg seminar**, Groningen  
The motivic Selmer scheme of the thrice-punctured line
- Nov 2021 **DIAMANT Symposium**, Utrecht  
Refined Selmer equations for the thrice-punctured line
- Nov 2021 **Ruth Moufang Lecture, introductory talk**, Frankfurt (online)  
Algebraic curves
- Jul 2021 **Groningen algebra seminar**, Groningen (online)  
Refined Selmer equations for the thrice-punctured line
- Mar 2021 **Oberwolfach workshop Homotopic and Geometric Galois Theory**, Oberwolfach  
The  $p$ -adic section conjecture for localisations of curves
- Dec 2020 **Online seminar on Selmer schemes organised by M. Kim**  
Refined Selmer equations for the thrice-punctured line in depth 2
- Nov 2019 **Pro-Doc seminar**, Frankfurt  
Étale fundamental groups and the section conjecture
- Jun 2019 **DaFra seminar**, Darmstadt/Frankfurt  
The Coleman–Chabauty method
- May 2019 **Kleine AG Learning Seminar**, Bonn  
Serre's Modularity Conjectures
- Nov 2018 **Young Researchers in Algebraic Number Theory**, Sheffield  
Anabelian Geometry
- May 2018 **Frankfurt learning seminar**, Frankfurt  
Log Geometry and the Kummer-étale site
- 2018 **DaFra seminar**, Darmstadt/Frankfurt  
Tamely Ramified Geometric Class Field Theory

- Nov 2017 **HU Berlin Algebra Seminar**, Berlin  
Birational Anabelian Reconstruction of Curves
- Nov 2017 **Frankfurt learning seminar**, Frankfurt  
Cartan involutions on algebraic groups and Lie algebras
- Nov 2017 **Kleine AG learning seminar**, Heidelberg  
Heights on abelian varieties
- Jun 2017 **Banff workshop Nilpotent Fundamental Groups**, Banff  
Birational Anabelian Geometry of Curves
- May 2017 **Student symposium on analogies**, Paris  
Milnor invariants and higher residue symbols
- Dec 2016 **DaFra seminar**, Darmstadt/Frankfurt  
Hodge theory
- Sep 2016 **Heidelberg Laureate Forum**, Heidelberg  
Ranks of Elliptic Curves (workshop with A. Wiles)
- May 2016 **DaFra seminar**, Darmstadt/Frankfurt  
Unramified cohomology
- Sep 2016 **Student conference of the Deutsche Mathematikervereinigung**, Hamburg  
Galois Groups and Fundamental Groups
- Sep 2015 **Kleine AG learning seminar**, Heidelberg  
Monads and Generalised Rings
- Jun 2015 **Frankfurt algebra seminar**, Frankfurt  
Birational Anabelian Geometry of Curves

## Awards and scholarships

- 2025 **2-year Minerva Fellowship**
- 2025 **MPIM postdoc scholarship**
- 2024 **Shortlisted for the RUG Faculty of Science and Engineering postdoc prize**
- 2024 **Offered a 2-year Kreitman postdoctoral fellowship at BGU, Be'er Sheva**
- Apr–May 2016 **Stay at Max Planck Institute for Mathematics**, Bonn
- 2016 Main prize of the student conference of the Deutsche Mathematikervereinigung DMV
- 2010–2015 **Studienstiftung des Deutschen Volkes**, scholarship
- 2006–2009 **Various prizes at competitions for high school students**  
e.g. Bundeswettbewerb Mathematik, Bundeswettbewerb Informatik, Abiturpreise Mathematik & Physik, Intel Leibniz Challenge, MPI student contest on self-organization in information processing

## Languages

- German**, native
- English**, fluent
- Dutch**, good
- Spanish**, good

**Latin**, good  
**French**, basic