Lars H. Halle
Curriculum Vitae

Department of Mathematics
University of Bologna
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Biographical Born March 7th 1977 in Tonsberg, Norway. Norwegian citizen.

Research Algebraic and arithmetic geometry, with particular interest in topics such as degenerations of curves, abelian varieties and Calabi-Yau varieties; motivic integration and zeta functions; rational points; Néron models; Hilbert schemes.

Education November 22nd 2007. *PhD, Mathematics*, KTH Stockholm. Advisor: C. Faber. Thesis: *Stable reduction of curves and tame ramification*.

Dec 2001. M.Sc. in Mathematics, University of Oslo.

Employment

Feb 1, 2021–present Associate Professor at the Dept. of Mathematics, U. of Bologna.

Aug 1, 2014–Jan 31, 2021 Associate Professor at the Dept. of Mathematical Sciences, U. of Copenhagen.
Aug 1, 2013–July 31, 2014 Associate Professor at U. of Stavanger.
Oct 1, 2010–July 31, 2013 Postdoc at U. of Oslo.
Jan 1, 2009–Sep 30, 2010 Postdoc at Leibniz Universitat Hannover.
Jan 1, 2008–Dec 31, 2008 Postdoc at KU Leuven.

Students and postdocs

- Supervised 10 M.Sc. theses.
- PhDs: Annelies Jaspers (2013–2017, joint supervision with J. Nicaise), Andrea Ricolfi (2013–2017, joint supervision with M. Gulbrandsen), Luigi Pagano (2018–2021).
- Mentoring of postdocs: Sho Tanimoto (2015–2017), Simon Rose (2015–2016), Daniel Bergh (2017–2019), Cody Gunton (2018–2020), Farbod Shokrieh (2018–2019).

Selected offices, Academic Service, Professional activities:

- Reviewer for grant proposals: NSA Mathematical Sciences Grant Program (2011) and Research Foundation - Flanders, Belgium (2015).
- Member of committee, and external expert, for hiring of Postdoc at Dept. of Mathematics, U. of Bergen (2017).
- Head of committee for 2 Postdoc hirings at Dept. of Mathematics, U. of Bologna (2022).
- Opponent/member of PhD jury: KTH Stockholm (2014), U. of Copenhagen (2014 & 2017), KU Leuven (2016 & 2022), Imperial College London (2020), U. of Bologna (2022), U. of Poitiers (2023).
- On the organizing or programme committee of 13 international workshops.
- Teaching coordinator within Section for Topology, Algebra and Functional Analysis, Dept. of Math. Sciences, Univ. of Copenhagen (2018–2021).

Funding

- Funding (approx. €30K) obtained for summer school *Toric Degenerations and Mirror Symmetry* (Nordfjordeid 2014), from Foundation Compositio Mathematica, ERC (starting grant MOTZETA of J. Nicaise), U. of Oslo, U. of Bergen, U. of Stavanger, U. of Tromso and NTNU. Co-applicant: J. Nicaise.
- Funding (approx. €10K) obtained for summer school *Varieties of Calabi-Yau type* (the Banach Center Warsaw 2016), from Foundation Compositio Mathematica, the Banach Center Warsaw. Co-applicants: O. Kedzierski, M. Kapustka and V. Lazic.
- Funding (approx. €10K) obtained from the following source: Styrelsen for Forskning og Innovation (Denmark). Co-applicants: D. Bergh (Univ. of Copenhagen) and

F. Shokrieh (Cornell Univ.).
• Luigi Pagano obtained a prestigious TALENT Doctoral Fellowship from the Faculty of Science, University of Copenhagen (2018).
• Co-applicant and member of PRIN2022 *Symplectic varieties: their interplay with Fano manifolds and derived categories* (PI: Prof. Giovanni Mongardi).

Collaborators

Johannes Nicaise, Imperial College London, UK & KU Leuven, Belgium (7 papers)
Klaus Hulek, Leibniz Universität Hannover, Germany (4 papers)
Martin Gulbrandsen, University of Stavanger, Norway, (3 papers)
Dennis Eriksson, Chalmers, Gothenburg , Sweden (1 paper)
Fedor Bogomolov, Courant Institute, New York University, USA (1 paper)
Fabien Pazuki, University of Copenhagen, Denmark (1 paper)
Sho Tanimoto, Kumamoto University, Japan (1 paper)
Simon Rose, University of Copenhagen, Denmark (1 paper)
Ziyu Zhang, ShanghaiTech University, China (2 papers)

Teaching Experience

Algebraic Geometry (NMAK14005U), *Commutative Algebra (NMAK14009U)*, *Geometry 1 (NMAA04013U)*, *Algebraic Geometry 2 (NMAK16000U)*, Univ. of Copenhagen.
Real and Complex Calculus (MAT 210), *Discrete Mathematics (MAT 120)*, Univ. of Stavanger.
97926- Geometric Number Theory, *75660 - Calculus and Linear Algebra*, Univ. of Bologna.

Publication information

Author of 1 research monograph and 14 published papers.

Published in the following top journals: *Adv. Math.* (2), *Doc. Math.* (2), *Math. Ann.* (2), *J. Algebraic Geom.* and Springer's *Lecture Notes in Mathematics*.

Selected talks at conferences and lecture series

2022 *Degenerations of Abelian Varieties*, Univ. of Padova. PhD course (16 hours).

2021 *Geometry and arithmetic of varieties with trivial canonical bundle*, Univ. of Oslo.

2019 *N-cube days XI*, Chalmers, Gothenburg.

2018 *Workshop on Birational Geometry*, HSE Moscow.

2017 *Models of Curves and Jacobians*, Stellenbosch Univ. PhD course (10 hours).

2017 *Zariski Density and Rational Points*, Univ. of Copenhagen.

2017 *Modern Geometry and Physics*, Loughborough Univ.

2017 *Toric Degenerations*, Univ. of Bristol.

2017 *Leuven Algebraic Geometry Day*, KU Leuven.

2017 *Dutch Intercity Number Theory Seminar*, Radboud Univ. Nijmegen.

2016 *Nordic Congress of Mathematicians* (Alg. Geo. session), Stockholm Univ.

2015 *Homological Mirror Symmetry, Deformation Quantization and Noncommutative Geometry* (masterclass), Univ. of Copenhagen. Lecture series (3×1 hours).

2013 *Motivic Invariants and Singularities*, Univ. of Notre Dame.

2012 *Algebraic and Complex Geometry*, Leibniz Univ. Hannover.

2012 *Galois Covers and Deformation*, Univ. of Bordeaux.

2011 *Nordic Conference in Algebraic Geometry*, KTH Stockholm.

2010 *Komplexe Analysis*, Oberwolfach.

International relations

• Longer research visits ($\geq$ 2 weeks): *ENS, Paris*, 1 month (2010); *Leibniz Univ. Hannover*, 2 weeks (2011); *KU Leuven*, 3 weeks (2013); *Univ. of Trento*, 1 month (2015/2016);

Stellenbosch Univ., 2 weeks (2017); *Institut Mittag-Leffler*, 3 weeks (2021).
• Co-founder of the *Nordic Number Theory Network* (`http://www.n-cube.net/`).

Lars H. Halle
Publication list

1. **L. H. Halle**: *Stable reduction of curves and tame ramification*, PhD thesis, KTH (2007). Available at: `http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-4494`

2. **L. H. Halle**: *Stable reduction of curves and tame ramification*, Math. Z. **265** Issue 3 (2010), 529–550.

3. **L. H. Halle**: *Galois actions on Néron models of Jacobians*, Ann. Inst. Fourier **60** No. 3 (2010), 853–903.

4. **L. H. Halle**, J. Nicaise: *The Néron component series of an abelian variety*, Math. Ann. **348**(3) (2010), 749–778.

5. **L. H. Halle**: *Degenerations of Calabi-Yau varieties, and the motivic monodromy conjecture*, Oberwolfach reports **7** Issue 3 (2010), 2293–2296.

6. **L. H. Halle**, J. Nicaise: *Motivic zeta functions of abelian varieties, and the monodromy conjecture*, Adv. Math. **227** (2011), 610–653.

7. **L. H. Halle**, J. Nicaise: *Jumps and monodromy of abelian varieties*, Doc. Math. **16** (2011), 937–968.

8. **L. H. Halle**, J. Nicaise: *Motivic zeta functions for degenerations of abelian varieties and Calabi-Yau varieties*, in: A. Campillo et al. (eds.), Recent Trends on Zeta Functions in Algebra and Geometry, Contemporary Mathematics, AMS and RSME (2012), 233–259.

9. M. Gulbrandsen, **L. H. Halle**, K. Hulek: *A Relative Hilbert-Mumford Criterion*, Manuscripta Math. **148** (2015), 283–301.

10. D. Eriksson, **L. H. Halle**, J. Nicaise: *A Logarithmic Interpretation of Edixhoven's Jumps for Jacobians*, Adv. Math. **279** (2015), 532–574.

11. **L. H. Halle**, J. Nicaise: *Néron Models and Base Change*, Lecture Notes in Mathematics (Springer) **2156** (2016), x + 151 pages.

12. **L. H. Halle**, S. Rose: *Tropical Count of Curves on Abelian Varieties*, Commun. Number Theory Phys. **11**, No. 1 (2017), 219–248.

13. F. Bogomolov, **L. H. Halle**, F. Pazuki and S. Tanimoto: *Abelian Calabi-Yau threefolds: Néron models and rational points*, Math. Res. Lett. **25** No. 2 (2018), 367–392.

14. **L. H. Halle**, J. Nicaise: *Motivic Zeta Functions of Degenerating Calabi-Yau Varieties*, Math. Ann. **370**, No. 3–4 (2018), 1277–1320.

15. M. Gulbrandsen, **L. H. Halle**, K. Hulek: *A GIT construction of degenerations of Hilbert schemes of points*, Doc. Math. **24** (2019), 421–472.

16. M. Gulbrandsen, **L. H. Halle**, K. Hulek, Z. Zhang: *The geometry of degenerations of Hilbert schemes of points*, J. Algebraic Geom. **30** (2021), 1–56.

17. **L. H. Halle**, K. Hulek, Z. Zhang: *Relative VGIT, and an application to degenerations of Hilbert schemes*, Michigan Math. J. **73** (2023), 67–96.

February 22, 2024