Ben Heuer

Curriculum Vitae

Fakultät für Mathematik und Physik
Welfengarten 1
30167 Hannover, Germany
ben.heuer@math.uni-hannover.de
bheuer.github.io

Professor of Algebra at Leibniz University Hannover, Germany. Particularly interested in non-archimedean geometry and its applications, p-adic Hodge theory, the Langlands programs and anabelian geometry.

Employment

10/2025 -present **Leibniz University Hannover**
Professor (W3), Institute for Algebra, Number Theory and Discrete Mathematics

10/2022 09/2025 **Goethe University Frankfurt**
Postdoc, Algebra und Geometry group, assistant of Annette Werner

10/2019 09/2022 **University of Bonn**
Postdoc, Arithmetic Algebraic Geometry group of Peter Scholze

Education

09/2015 -09/2019 **London School of Geometry and Number Theory, King's College London**
PhD, supervised by Kevin Buzzard
Thesis: Perfectoid geometry of p-adic modular forms

10/2014 -06/2015 **University of Cambridge, Hughes Hall College**
Master of Advanced Studies in Mathematics (Part III), graduated with Distinction

10/2011 -09/2014 **Heidelberg University**
Bachelor of Science in Mathematics, very good 1.1

Publications

p-adic non-abelian Hodge theory for curves via moduli stacks.
With Daxin Xu.
J. Amer. Math. Soc., to appear, accepted in 2025.

Moduli spaces in p-adic non-abelian Hodge theory.
J. Algebr. Geom., to appear, accepted in 2025.

The relative Hodge–Tate spectral sequence for rigid analytic spaces.
J. Lond. Math. Soc. (2) 112 (2025), no. 4, Paper No. e70318.

A p-adic Simpson correspondence for smooth proper rigid spaces.
Invent. Math. 240 (2025), no. 1, 261–312.

G-torsors on perfectoid spaces.
Epijournal Geom. Algebr., to appear, accepted in 2025.

Hodge–Tate stacks and non-abelian p-adic Hodge theory of v-perfect complexes...
With Johannes Anschütz and Arthur-César Le Bras.
J. Reine Angew. Math. (Crelle), 820 (2025), 235–305.

v-vector bundles on p-adic fields and Sen theory via the Hodge–Tate stack.
With Johannes Anschütz and Arthur-César Le Bras.
Simons Symp., to appear, accepted 2024.

The small p-adic Simpson correspondence in terms of moduli spaces.
With Johannes Anschütz and Arthur-César Le Bras.
Math. Res. Lett., to appear, accepted in 2024.

Diamantine Picard functors of rigid spaces.
Trans. Amer. Math. Soc., 378 (2025), no. 8, 5475–5511

p-adic Simpson correspondences for principal bundles in abelian settings.
With Annette Werner and Mingjia Zhang.
Canad. J. Math., to appear, accepted 2024.

The Primitive Comparison Theorem in characteristic p.
Math. Z., 308 (2024), no. 3, Paper No. 55, 22 pp.

Perfectoid spaces. In: Non-Archimedean Geometry and Eigenvarieties.
Editors: Eugen Hellmann, Judith Ludwig, Otmar Venjakob
Münster Lect. in Math., 297 EMS Press, pp. 159–222, 2024. bheuer.github.io/PerfectoidNotes.pdf

A geometric p-adic Simpson correspondence in rank one.
Compos. Math., 160(7):1433–1466, 2024.

The p-adic Corlette–Simpson correspondence for abeloids.
With Lucas Mann and Annette Werner.
Math. Ann., 385(3-4):1639–1676, 2023.

Overconvergent Hilbert modular forms via perfectoid modular varieties.
With Christopher Birkbeck and Chris Williams.
Ann. Inst. Fourier, 73(4):1709–1794, 2023.

Line bundles on rigid spaces in the v-topology.
Forum Math. Sigma, 10:Paper No. e82, 36, 2022.

Cusps and q-expansion principles for modular curves at infinite level.
Doc. Math., 27:2385–2440, 2022.

Perfectoid covers of abelian varieties.
With Clifford Blakestad, Damián Gvirtz, Daria Shchedrina, Koji Shimizu, Peter Wear, Zijian Yao.
Math. Res. Lett., 29(3):631–662, 2022.

Rigid τ-crystals.
J. Théor. Nombres Bordeaux, 29(3):1059–1082, 2017.

Proof-reading guidance in cell tracking by sampling tracking-by-assignment models.
With Martin Schiegg, Carsten Haubold, Steffen Wolf, Ulrich Koethe, Fred A Hamprecht.
Biomedical Imaging (ISBI), 2015 IEEE 12th International Symposium.

All solutions to the immobilizer problem.
With John Conway.
Math. Intelligencer, 36(4):78-86, 2014.

Teaching

2025-26 **Lecture course "Linear Algebra I", Leibniz University Hannover**
2025-26 **Lecture course "Zahlentheorie und Kryptographie", Leibniz University Hannover**
2025 **Lecture course "Perfectoid spaces", University of Frankfurt**
2025 **Assistant for "Lineare Algebra II" (Werner), University of Frankfurt**
2024-25 **Seminar "Algebraische Kurven", University of Frankfurt**
2023-24 **Proseminar "Quadratische Formen", University of Frankfurt**
2023-24 **L3-Seminar "Geschichte der Mathematik", University of Frankfurt**
2023 **Seminar "Non-archimedean geometry", University of Frankfurt**
2023 **Assistant for "Linear Algebra II" of Annette Werner, University of Frankfurt**
2022-23 **L3-Seminar "Geschichte der Mathematik", University of Frankfurt**
2022-23 **Proseminar "Beweismethoden", University of Frankfurt**
2022 **Lecture course "Rigid Analytic Geometry", University of Bonn**

Invited Research Talks

01/2026 **Northern German Algebraic Geometry Seminar, Humboldt Univ. Berlin**
12/2025 **Göttingen-Hannover Number Theory Workshop**
12/2025 **Max Planck Institute Bonn**
11/2025 **Univ. of Princeton, Algebraic Geometry Seminar**
11/2025 **Univ. of Maryland, workshop: "Complex and p-adic Simpson Correspondence "**
07/2025 **Journées Arithmétiques 25, University of Luxemburg**
Recording `https://www.youtube.com/watch?v=K4MtZ5PS53M`
06/2025 **Oberwolfach, workshop "Non-archimedean Geometry"**
05/2025 **Univ. of Regensburg, seminar "SFB lecture"**
01/2025 **Univ. of Münster, seminar "Arithmetic Mittagsseminar"**
11/2024 **Imperial College London, Langlands Seminar**
11/2024 **Imperial College London, Number Theory Seminar**
11/2024 **Univ. of Milan, seminar "Arithmetica Transalpina"**
10/2024 **Univ. of Heidelberg, seminar "Geometry and Arithmetic of Uniformized Structures"**
10/2024 **Sorbonne Univ., Paris Jussieu, seminar "reductive groups and automorphic forms"**
09/2024 **Univ. of Paderborn, Conference: Geometry and arithmetic of moduli spaces**
07/2024 **Oberwolfach, workshop "Arithmetic Geometry"**
06/2024 **Univ. of Padua, workshop: "Riemann–Hilbert correspondences – classical & p-adic"**
03/2024 **IAS Princeton, Conference: "Workshop on p-adic Arithmetic Geometry"**
Recording: `https://www.youtube.com/watch?v=3UoHFRgE5B4`
02/2024 **Univ. of Chicago, "Geometric Langlands Seminar"**
Recording of part 1: `https://www.youtube.com/watch?v=U6uVj_ipYnM`
01/2024 **Univ. of Mainz, "GAUS colloquium"**
05/2023 **Peking Univ., "One-Day workshop on p-adic non-abelian Hodge theory"**
05/2023 **Morningside Center, Beijing, seminar talk**
05/2023 **Peking Univ.**
05/2023 **ISTA Vienna, Algebraic Geometry and Number Theory Seminar**
03/2023 **Univ. of Heidelberg, Spring School "Eigenvarieties"**
12/2022 **Paris-Saclay Univ., Orsay, seminar "Arithmétique et Géométrie Algébrique"**
12/2022 **Univ. of Strasbourg, seminar "Arithmétique et Géométrie Algébrique"**
12/2022 **Wuppertal Univ., Oberseminar Algebra und Topologie**
10/2022 **University of Darmstadt, conference: "Arithmetic Algebraic Geometry"**
05/2022 **Univ. of Heidelberg, "Seminar of SFB/TRR 326 GAUS"**
04/2022 **Peking Online International Number Theory seminar**
03/2022 **IMPAN Warsaw seminar**
03/2022 **Univ. of Warsaw, Algebraic Geometry Seminar**
02/2022 **Oberwolfach Workshop**
11/2021 **Univ. of Duisburg-Essen, Oberseminar**
07/2021 **Univ. of Bielefeld, Algebraic and Arithmetic Geometry Seminar**
07/2021 **Univ. of Bonn, Oberseminar der AG Arithmetische Geometrie**
01/2021 **Zoom seminar "Recent Advances in Modern p-Adic Geometry (RAMpAGe)"**
11/2020 **Univ. of Bonn, Oberseminar der AG Arithmetische Geometrie**
09/2020 **Univ. of Berkeley, Arithmetic Geometry and Number Theory Seminar**
05/2020 **Zoom seminar "Algebraic Geometry and Arithmetic (ZAGA) "**
10/2019 **Univ. of Bonn, Oberseminar der AG Arithmetische Geometrie**

10/2019 **Univ. of Münster, Lunch Seminar Arithmetics**

05/2019 **King's College London, London Number Theory Seminar**

11/2018 **Univ. of Sheffield, Conference: "Young Researchers in Algebraic Number Theory"**

10/2018 **Univ. of Bonn, Oberseminar der Arbeitsgemeinschaft Arithmetische Geometrie**

06/2018 **Univ. of Warwick, Number Theory Seminar**

Supervision

2022-23 Abhijit Aryampilly Jayanthan, Master's Thesis: "vector bundles on pro-finite-étale covers of elliptic curves" (University of Bonn)

2020-21 Fernando Pena, Master's Thesis: "non-archimedean uniformisation of abeloid varieties" (University of Bonn)

Event organisation

03/2025 **GROW@Frankfurt**
Co-organised two-day conference for female maths students

03/2024 **Ruth Moufang Lectures**
Co-organised two-day lecture series by Ana Caraiani in Frankfurt, joint with Gebhard Böckle and Nils Scheithauer

12/2023 **Ruth Moufang Lectures**
Co-organised two-day lecture series by Ariane Mézard in Heidelberg, joint with Gebhard Böckle and Nils Scheithauer

07/2023 **Young Researchers Network**
Co-organised week-long workshop for 25 junior researchers for Hausdorff Trimester program "Arithmetic of the Langlands Program", joint with Andreas Mihatsch and Mingia Zhang

03/2023 **GROW@Bonn**
Co-organised two-day conference for female maths students

11/2022 **Kleebach workshop on the work of Lue Pan**
Co-organised week-long workshop for 12 mostly junior researchers, joint with Arthur–César Le Bras and Johannes Anschütz

03/2022 **GROW@Bonn**
Co-organised three day conference for female maths students

03/2022 **Kleine AG**
Co-organised one-day workshop on Deligne's article Weil II, with Mingjia Zhang

term 3/2019 **London Number Theory Seminar "On the generic part of the cohomology of compact unitary Shimura varieties"**
Co-organised with Ana Caraiani and Toby Gee

term 1/2016 **LSGNT Lunch Time Seminar**
Co-organised weekly seminar introducing graduate students to mathematicians in London

08/2016 **4th Heidelberg Laureate Forum**
Organised workshop with Andrew Wiles: "Heuristics for ranks of elliptic curves"

07/2015 **Modern Mathematics International Summer School for Students**
Teaching Assistant, Talks on Fermat's Last Theorem