

Lennart Meier - Curriculum Vitae

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Research Interests

Algebraic topology, (derived) algebraic and arithmetic geometry

Education

- **University of Bonn**

Ph.D. in Mathematics, August 2012

Advisor: Stefan Schwede. Title: *United Elliptic Homology*

Diplom in Mathematics and Philosophy (minor), 2009 (with distinction)

Advisor: Matthias Kreck. Title: *A Geometric View on String Topology*

- **University of Bielefeld**

Vordiplom in Mathematics and Philosophy (minor), 2006

Employment

- **Universiteit Utrecht**, Universitair docent, **2018 - present** (tenured since 2020)
- **University of Bonn**: Wissenschaftlicher Mitarbeiter: **2015 - 2017**
- **University of Virginia**: Whyburn Instructor: **2013 - 2015**
- **University of Bonn**: Wissenschaftlicher Mitarbeiter: **2012**

Publications

1. Spectral Sequences in String Topology, *Algebraic & Geometric Topology* 11 (2011), 2829–2860
2. Hilbert Manifolds, *Bulletin of the Manifold Atlas* (2014, expository)
3. Vector Bundles over the Moduli Stack of Elliptic Curves, *Journal of Algebra* 428 (2015), 425–456
4. Affineness and Chromatic Homotopy Theory (with Akhil Mathew), *Journal of Topology* (2015) 8(2), 476–528
5. Fibrancy of Partial Model Categories (with Viktoriya Ozornova), *Homology, Homotopy and Applications* 17.2 (2015), 53–80
6. Fibration Categories Are Fibrant Relative Categories, *Algebraic & Geometric Topology* 16 (2016) 3271–3300

7. The C_2 -spectrum $Tmf_1(3)$ and its invertible modules (with Mike Hill), Algebraic & Geometric Topology 17 (2017) 1953-2011
8. Gorenstein duality for Real spectra (with John Greenlees), Algebraic & Geometric Topology 17-6 (2017), 3547-3619
9. Monadicity of the Bousfield-Kuhn functor (with Rosona Eldred, Gijs Heuts and Akhil Mathew), Proc. Amer. Math. Soc. 147 (2019), 1789-1796
10. Rings of modular forms and a splitting of $TMF_0(7)$ (joint with Viktoriya Ozornova), Selecta Mathematica (2020) 26:7
- 10 $\frac{1}{2}$. Appendix B of Descent in algebraic K-theory and a conjecture of Ausoni-Rognes (with Niko Naumann and Justin Noel), Journal of European Mathematical Society (2020)
11. The Brauer group of the moduli stack of elliptic curves (with Benjamin Antieau), Algebra and Number Theory, Vol. 14 (2020), No. 9, 2295-2333
12. A Whitehead theorem for periodic homotopy groups (with Tobias Barthel and Gijs Heuts), Israel Journal of Mathematics volume 241 (2021)
13. Topological modular forms with level structures: decompositions and duality, Transactions of the American Mathematical Society 375 (02), 1305-1355 (2022)

Preprints

14. Decomposition results for rings of modular forms (accepted at Documenta Mathematica)
15. Purity in chromatically localized algebraic K-theory (with Markus Land, Akhil Mathew and Georg Tamme)
16. On equivariant topological modular forms (joint with David Gepner)
17. Norms of Eilenberg-Mac Lane Spectra and Real Bordism (joint with XiaoLin Danny Shi and Mingcong Zeng)
18. Connective Models for Topological Modular Forms of Level n

Grants and Scholarships

- NWO Vidi (Principal Investigator): *Understanding symmetries of spaces via modular forms*
Financing PhD position, postdoc position and conferences, 2021-2026
- NWO-Klein-1 (Principal Investigator): *The interplay of orientations and symmetry*
Financing one PhD position, 2020-24
- Principal investigator of DFG grant:
Chromatic Derived Algebraic Geometry and Equivariant Homotopy Theory, 2015-2018
Financing own postdoc position, part of SPP 1786: *Homotopy theory and algebraic geometry*
- Scholarship from Deutsche Telekom-Stiftung, 2009–2012

- Scholarship from GRK 1150 (Research training group on homotopy and cohomology), 2009
- Scholarship from Deutsche Studienstiftung, 2006–2009

Teaching Experience

- **Universiteit Utrecht**

Spring 2022: Algebraic Topology II (with Sagave); Seminar on the Immersion Conjecture (with Blans)
 Fall 2021: Introduction to topology
 Spring 2021: Seminar on spectral sequences (with Heuts)
 Fall 2020: Algebraic Topology I (with Heuts); Proofs in mathematics; Introduction to topology
 Fall 2019: Algebraic Topology I; Elementary Number Theory; Orientation in Mathematical Research (with Spitoni)
 Spring 2019: Topology and Geometry; Seminar on rational homotopy theory (with Heuts); Algebraic Topology II (with Heuts)
 Spring 2018: Topology and Geometry; Seminar on topological K-theory (with Heuts)

- **University of Virginia**

Spring 2015: Survey of Algebra; Introduction to Geometry
 Fall 2014: Calculus III
 Spring 2014: Topics in Algebraic Topology: Homology Theories and Spectra; Elementary Linear Algebra
 Fall 2013: Elementary Linear Algebra
 Spring 2013: Survey of Algebra (two courses)

- **University of Bonn**

Winter 2017: Reading course on the Adams spectral sequence
 Summer 2017: Lecture course on Elliptic Cohomology and Topological Modular Forms
 2015-16: (Co-)Organizer of work group seminar 'Homotopy Theory'
 2015-16: Math club for high school students
 Winter 2012: Assistant for Linear Algebra 1 (developing exercise sheets)
 2009-11: (Co-)Organized PhD seminars on the topics 'The Nilpotence Theorem', 'The Atiyah-Singer Index Theorem and Spin Geometry' and 'Chromatic Homotopy Theory'
 2007-09: Teaching assistant (grading and recitations) at the University of Bonn for the courses Analysis 1, Analysis 2 and Classification of 1-connected 4-manifolds

PhD students

- Sven van Nigtevecht (2025)
- Itamar Mor (2024, cosupervision; student based at Queen Mary with Behrang Noohi as official supervisor)
- Jaco Ruit (2024)
- Jack Davies (2022)

Master students

- Ryan Quinn: Equivariant Localization Formulae (2022)
- Christiaan van den Brink: Symmetries in Discrete Morse Theory and Topological Data Analysis (2022)
- Divya Ghanshani: Homology theories in cofibration categories (2021)
- Pascal Sitbon: Equivariant bordism (2020)
- Abe ten Voorde: Cyclic algebras over local fields arising from elliptic curves (2020)
- Jeroen van der Meer: K -local spectra and stacks (2019)
- Jorge Becerra: K-theory with Reality (2019)
- Joost van Geffen: Bordism rings (2019)
- Simone Fabbrizzi: Brauer groups of stacks (2018)

Bachelor students

- Wietse Bosman, Category Theory and Haskell (2022)
- Vincent Kuhlmann, The Aharonov–Bohm effect (2022, with Dirk Schuricht)
- Tess van Leeuwen, Representations of the Lie algebra $\mathfrak{su}(2)$ and the AKLT model (2021, with Dirk Schuricht)
- Marien Matser, The categorical origin of monads in Haskell (2021)
- Dennis Hilhorst, Braid groups (2021, with Dirk Schuricht)
- Paul van Hoegaerden, Clifford algebras and their application in the Dirac equation (2021, with Dirk Schuricht)
- Hanna den Oudsten, The path integral (2021, with Dirk Schuricht)
- Casper van Hal: An introduction into Lie Groups, Lie Algebras, Representations and Spin (2021, with Dirk Schuricht)
- Corijn Rudrum: Elliptic curves and the Yang–Baxter equation (2020, with Dirk Schuricht)
- Gerben Lamers: Homotopy groups of spheres using the Pontryagin theorem (2020)
- Bouke Jansen: Principal Bundles (2020)
- Max Meijer: Combinatorial topology and distributed computing (2019)
- Martijn de Waal: De Rham cohomology (2018)
- Niklas Hellmer: Geschlechtsformeln für Modulkurven (2017)
- Süleyman Karaca: Homologie mit lokalen Koeffizienten (2016)

Other Activities

- Organizer for a spring school on interactions of algebraic topology and field theories, 2022, Driebergen
- Coorganizer of the European Autumn Schools in Topology 2017, 2018 and 2019, Driebergen
- Coorganizer of ‘Workshop on ∞ -operads’ (2018), Driebergen
- Coorganizer of miniworkshops on ‘ ∞ -categories’ (2017), ‘Infinite loop spaces and ∞ -categories’ (2018) and ‘The Picard group of TMF and ∞ -categories’ (2019), Utrecht.
- Reviewer for Zentralblatt and MathSciNet
- Teacher at numerous math olympiad training camps and other mathematical activities for high school students 2003-20

Research Visits

- February 2020, MSRI Berkeley
- July – October 2018, Isaac Newton Institute Cambridge
- October - December 2016, Hausdorff Institute Bonn
- June - August 2015, Hausdorff Institute Bonn
- May - August 2014, University of Bremen
- January 2014, University of Bremen
- June - July 2013, University of Bonn

Talks

I have given the following invited plenary conference talks.

- 2021, Workshop on Equivariant techniques in stable homotopy theory, AIM (USA)
- 2021, Opening workshop Higher Homotopical Structures, CRM Barcelona (Spain)
- 2020, Elliptic Cohomology and Physics, Perimeter Institute, Waterloo (Canada)
- 2020, Equivariant Stable Homotopy Theory and p-adic Hodge Theory, Banff (Canada)
- 2019, Workshop on Algebraic Geometry and Homotopy Theory, Nijmegen (Netherlands)
- 2019: British topology meeting, Warwick (UK)
- 2019: International Workshop on Algebraic Topology, Shanghai (China)
- 2019: Workshop on Homotopy Theory, Oberwolfach (Germany)
- 2019: Elliptic Cohomology Days, Urbana–Champaign (USA)
- 2018: Derived algebraic geometry and chromatic homotopy theory, Isaac Newton Institute, Cambridge (UK)
- 2018: GQT Colloquium, Groesbeek (Netherlands)
- 2017: Conference on invertible objects and duality in derived algebraic geometry and homotopy theory, Regensburg (Germany)

- 2016: Equivariant Derived Algebraic Geometry, Banff (Canada)
- 2015: NRW Topology Meeting, Bochum (Germany)
- 2015: Midwest Topology Seminar, Chicago (USA)
- 2014: Modular Invariants in Topology and Analysis, Regensburg (Germany)
- 2012: NRW Topology Meeting, Bielefeld (Germany)

I have given lecture series at summer schools in Strasbourg (France, 2019), Utrecht (Netherlands, 2019) and Groesbeek (Netherlands, 2018).

I have given invited talks in topology seminars in Aberdeen (UK, 2021), Bochum (Germany, 2020, 2018, 2016, 2011), Bonn (Germany, 2020, 2016, 2015, 2014), Chicago (USA, 2020, 2016), Copenhagen (Denmark, 2019, 2016), Johns Hopkins (USA, 2016, 2014), MIT (USA, 2013), Münster (Germany, 2020, 2018), Regensburg (Germany, 2019, 2016), Rochester (USA, 2016), Sheffield (UK, 2016), Stockholm (Sweden, 2017), Strasbourg (France, 2017, 2012), UIC (USA, 2016), Virginia (USA, 2016, 2014, 2013), Warwick (UK, 2020), Wayne State (USA, 2013), Western Ontario (USA, 2016), and Wuppertal (Germany, 2011).

Other invited talks include the algebra seminar at Queen Mary (UK, 2022) seminar at the program Higher Categories and Categorification at the MSRI (USA, 2020), OATS (UK, 2020), the electronic algebraic K-theory seminar (worldwide, 2020) the SFB lecture in Regensburg (Germany, 2019), the Mathematics Colloquium in Amsterdam (Netherlands, 2018), the Algebra Seminar in Leiden (Netherlands, 2018), the Séminaire Homotopie en Géométrie Algébrique in Toulouse (France, 2018), the Electronic computational homotopy theory seminar (worldwide, 2021, 2017) and the Arbeitsgemeinschaft arithmetische Geometrie Rapoport–Scholze in Bonn (Germany, 2016).