

Curriculum Vitae

Name: Marcus Zibrowius
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Employment

- since June 2020 **Professor of Topology and Geometry (W2)**
Heinrich Heine University Düsseldorf
parental leave: 22 months full-time and 13 months part-time (50 %)
Teaching grant *ADAM: Anticipating the Digital Age of Mathematics* (ca. 270 K €)
PI within GRK 2240: *Algebro-geometric Methods in Algebra, Arithmetic and Topology* (ca. 2.3 M €)
PI within DFG grant *Computations of Chow-Witt groups for split quadrics and other smooth varieties*, funded by DFG Priority Programme 1786: *Homotopy Theory and Algebraic Geometry* (ca. 200 K €)
- Apr 2015 – June 2020 **Junior Professor of Topology and Geometry**
Heinrich Heine University Düsseldorf
positive evaluation (*Zwischenevaluation*) Dec 2017
- Oct 2014 – Mar 2015 **Stand-in professor, Ludwig Maximilian University of Munich**
- Feb 2012 – Mar 2012 **Visiting scientist, Max Planck Institute for Mathematics, Bonn**
(initially invited for a one-year stipendiary research visit)
- Oct 2011 – Sep 2014 **Research associate, University of Wuppertal**

Education

- Oct 2007 – Apr 2011 **PhD in Mathematics, DPMMS, University of Cambridge (Trinity Hall)**
thesis: *Witt groups of complex varieties* · supervisor: Prof. Burt Totaro
funded by Engineering and Physical Sciences Research Council (2007–2010) and Cambridge Philosophical Society (research studentship Jan–Mar 2011)
Smith-Knight/Rayleigh-Knight Prize (Prize group 3), awarded Mar 2009
degree conferred July 2011
- Oct 2006 – June 2007 **Part III of the Mathematical Tripos, University of Cambridge (Trinity Hall)**
funded by Evangelisches Studienwerk Villigst/German Federal Ministry of Education and Research (fees and maintenance)
Certificate of Advanced Studies in Mathematics June 2007, *with distinction*
Master of Advanced Study July 2011
Bateman Scholarship, awarded by Trinity Hall June 2007
- Oct 2004 – July 2006 **Degree course in Mathematics and Physics, Ruhr-Universität Bochum**
Vordiplom April 2006; highest possible grade

- J. Hornbostel, H. Rohrbach & M. Zibrowius,
Atiyah-Segal completion for the Hermitian K-theory of Symplectic Groups
 Accepted for publication in [Algebraic & Geometric Topology](#).
- T. Hemmert & M. Zibrowius,
The Witt rings of many flag varieties are exterior algebras
[Trans. Amer. Math. Soc.](#), vol. 377, no. 9 (2024), 6427–6463.
- M. Zibrowius, **Dual involutions in Coxeter groups**
[Communications in Algebra](#), 52:3 (2024), 1028–1037.
- M. Amann, D. González-Álvaro & M. Zibrowius, [MR4436340](#)
Vector bundles of non-negative curvature over cohomogeneity one manifolds
[Adv. Math.](#) 405 (2022), Paper No. 108477.
- D. González-Álvaro & M. Zibrowius, [MR4318296](#)
The stable converse soul question for positively curved homogeneous spaces
[J. Differential Geom.](#) 119 (2) (2021), 261–307.
- J. Hornbostel, M. Wendt, H. Xie & M. Zibrowius, [MR4301905](#)
The real cycle class map
[Annals of K-Theory](#) 6-2 (2021), 239–317.
- D. González-Álvaro & M. Zibrowius, [MR4138927](#)
Open manifolds with non-homeomorphic positively curved souls
[Math. Proc. Camb. Phil. Soc.](#) 169 (2020), 357–376.
- J. Hornbostel, H. Xie & M. Zibrowius, [MR4071214](#)
Chow–Witt rings of split quadrics
[Motivic homotopy theory and refined enumerative geometry](#), 123–161. [Contemp. Math.](#), 745, Amer. Math. Soc., Providence, RI (2020).
- M. Zibrowius, **The γ -filtration on the Witt ring of a scheme** [MR3815155](#)
[Q. J. Math.](#) 69 (2018), no. 2, 549–583.
- M. Zibrowius, **Nilpotence in Milnor-Witt K-Theory**
 appendix to: J. Hornbostel, Some comments on motivic nilpotence. [MR3748592](#)
[Trans. Amer. Math. Soc.](#) 370 (2018), 3001–3015.
- M. Zibrowius, **Symmetric representation rings are λ -rings** [MR3425635](#)
[New York J. Math.](#) 21 (2015), 1055–1092.
- M. Zibrowius, **KO-rings of full flag varieties** [MR3301890](#)
[Trans. Amer. Math. Soc.](#) 367 (2015), 2997–3016.
- M. Zibrowius, **Witt groups of curves and surfaces** [MR3267576](#)
[Math. Zeits.](#) 278 (2014), Nr. 1-2, 191–227.
- M. Zibrowius, **Twisted Witt groups of flag varieties** [MR3238260](#)
[J. K-Theory](#) 14 (2014), Nr. 1, 139–184.
- M. Zibrowius, **Witt groups of complex cellular varieties** [MR2823367](#)
[Documenta Math.](#) 16 (2011), 465–511.

Conference publications

B. M. Ruppik, M. Heck, C. van Niekerk, R. Vukovic, H. Lin, S. Feng, M. Zibrowius & M. Gasic, **Local Topology Measures of Contextual Language Model Latent Spaces With Applications to Dialogue Term Extraction**

[Proceedings of the 25th Annual Meeting of the Special Interest Group on Discourse and Dialogue \(SigDIAL 2024\)](#), 344–356, Association for Computational Linguistics (2024).

R. Vukovic, M. Heck, B. Ruppik, C. van Niekerk, M. Zibrowius & M. Gasic, **Dialogue Term Extraction using Transfer Learning and Topological Data Analysis**

[Proceedings of the 23rd Annual Meeting of the Special Interest Group on Discourse and Dialogue \(SigDIAL 2022\)](#), 564–581, Association for Computational Linguistics (2022).

A. Jakubowski, M. Gašić & M. Zibrowius, **Topology of Word Embeddings: Singularities Reflect Polysemy**

[Proceedings of the Ninth Joint Conference on Lexical and Computational Semantics \(*SEM 2020\)](#), 103–113, Association for Computational Linguistics (2020). Best Paper Award.

Preprints

arXiv:

M. Zibrowius, **An extension of Steinberg's Theorem to biquotient pairs of subgroups**

[2305.02010](#)

Teaching

Courses

since 2014 prepared and taught lectures, set example sheets and exams, in Munich and in Düsseldorf

Undergraduate level

- Lectures *Linear Algebra I & II* (up to 500 students)
- Lectures *Introduction to Topology*
- Tutorial *Linear Algebra I*
- Seminars on *Stone Spaces*, *Quadratic forms*, *Topological Data Analysis*, *Knot theory*

Graduate level

- Lectures *Algebraic Topology I, II & III*
- Lectures on *Homological Algebra* and *Category Theory*
- Lecture *Algebraic Geometry*
- Seminars on *Algebraic K-theory* and on *The Milnor Conjectures*

Supervisions

PhD supervision

- since Sep 2024 Fabian Rodatz (GRK 2240)
Quadratic Invariants of Representation Categories
- since Apr 2021 Jan Hennig (GRK 2240)
A cellular Milnor-Witt (co)homology computation for the moduli space of stable, genus 0 curves with marked points
- Sep 2018 – Jan 2022 Arthur Martirosian (GRK 2240)
Thesis: *Witt groups of maximal isotropic Grassmann bundles*

- Aug 2015 – Jun 2018 Tobias Hemmert
Thesis: *KO-theory of complex flag varieties*
- since 2021 PhD co-supervision of Herman Rohrbach, Thor Wittich, Andrea Lachmann, Alexander Ziegler, Bhavna Joshi
- Supervision of bachelor's theses**
- since 2017 topics: *Model categories · Seifert circles and the braid index · Markow's Theorem · The Jordan Curve Theorem · Sums-of-squares-formulas · The writhe of alternating links · and others . . .*
- Supervision of master's theses**
- since 2017 topics: *The topology of word embeddings · Topological data analysis of embedded trees · A generalization of a theorem of Pittie · The product theorem for united representation rings · KO-theory of complex flag varieties of Dynkin type E · and others . . .*

Outreach

- 2015 – 2020 **Outreach coordinator** at the Mathematical Institute, Heinrich Heine University
talks for high school students and teachers · supervision of interns · Girls' day · support for gifted high school students taking university courses