

# Curriculum Vitæ

## Claudius Zibrowius

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**Website** <https://cbz20.raspberrypi.com/>  
**Personal** Born in 1990; German Citizen

### Academic career

since 2024 **W2 Professor** at Ruhr-University Bochum, DE  
2023 – 2024 **Assistant Professor**, later **Associate Professor**, at Durham University, UK  
2022 – 2023 **DFG Postdoctoral Research Fellow** at the University of Regensburg, DE  
funded through a DFG individual research grant (project number 505125645)  
2020 – 2022 **Postdoctoral Research Fellow** at the University of Regensburg, DE  
member of the research group of Dr L. Lewark  
2018 – 2020 **Postdoctoral Research and Teaching Fellow** at UBC, CA  
member of the research group of Dr L. T. Watson  
2017 – 2018 **CIRGET Postdoctoral Student** at the Université de Sherbrooke, CA  
member of the research group of Dr L. T. Watson  
2017 **Postdoctoral Visitor** at the Isaac Newton Institute, University of Cambridge, UK  
2013 – 2017 **PhD studies** at DPMMS, University of Cambridge, UK  
PhD thesis: On a Heegaard Floer theory for tangles  
supervisor: Dr J. A. Rasmussen  
2012 – 2013 **Part III of the Mathematical Tripos**  
Trinity Hall, University of Cambridge, UK  
Essay: Khovanov stable homotopy, supervisor: Dr J. A. Rasmussen  
Master of Advanced Studies (MASt) with distinction (six  $\alpha$  grades)  
2010 – 2012 **Undergraduate studies** in mathematics (major) and physics (minor)  
University of Duisburg-Essen, Campus Essen, DE  
Bachelor's thesis: On the Milnor fibration, supervisor: Prof. G. Hein  
Bachelor's degree (BSc) with distinction (1.0)

### Publications

#### in major scientific journals

**Kotelskiy, Watson, Z. — Thin links and Conway spheres** 📄  
to appear in Compositio Mathematica, 50 pages, arXiv: 2105.06308  
**Z. — On symmetries of peculiar modules; or,  $\delta$ -graded link Floer homology is mutation invariant** 📄  
Journal of the European Mathematical Society 25.8 (2023), 2949–3006  
**Lidman, Moore, Z. — L-space knots have no essential Conway spheres** 📄  
Geometry & Topology 26.5 (2022), 2065–2102  
**Kotelskiy, Lidman, Moore, Watson, Z. — Cosmetic operations and Khovanov multicurves** 📄  
Mathematische Annalen (2023), 1–28  
**Z. — Peculiar modules for 4-ended tangles** 📄  
Journal of Topology 13.1 (2020), 77–158  
**Kotelskiy, Watson, Z. — A mnemonic for the Lipshitz-Ozsváth-Thurston correspondence** 📄  
Algebraic & Geometric Topology 23.6 (2023), 2519–2543

## **Z. — Kauffman states and Heegaard diagrams for tangles**

Algebraic & Geometric Topology 19.5 (2019), 2233–2282

**in conference proceedings and other peer-reviewed scientific journals**

## **Z. — Heegaard Floer multicurves of double tangles**

to appear in the proceedings of *Frontiers in Geometry and Topology*, a conference in honour of Tom Mrowka's 60th birthday, 31 pages (arXiv: 2212.08501)

## **Kotelskiy, Watson, Z. — Khovanov homology and strong inversions**

*Gauge theory and low-dimensional topology: progress and interaction*, Open Book Series 5.1 (2022), 223–244

## **Lewark, Z. — Rasmussen invariants**

Mathematical Research Postcards 1.2 (2021)

## **Preprints**

## **Lewark, Z. — Rasmussen invariants of Whitehead doubles and other satellites**

48 pages, arXiv: 2208.13612, submitted

## **Kotelskiy, Watson, Z. — Khovanov multicurves are linear**

41 pages, arXiv: 2202.01460



## **Kotelskiy, Watson, Z. — Khovanov invariants via Fukaya categories: the tangle invariants agree**


14 pages, arXiv: 2004.01619, submitted


## **Kotelskiy, Watson, Z. — Immersed curves in Khovanov homology**


95 pages, arXiv: 1910.14584, submitted


## **Programming**

**kht++** ( website |  github), a C++ program for computing Khovanov invariants of links and tangles, in particular the Khovanov multicurve invariants for Conway tangles


**KhT** ( website |  github), joint with G. Chhina, a prototype for kht++, written in python

**PQM.m** , a Mathematica package for computing peculiar modules and the corresponding multicurves for Conway tangles

**BSFH.m** , a Mathematica package for computing R. Zarev's bordered sutured Floer homology from nice diagrams

**APT.m** , a Mathematica package for computing Alexander polynomials for tangles


## **Teaching**

*see my website  for all past and present teaching resources*

2023 **Lecturer** for MATH 4161/MATH 41120 Algebraic Topology

2023 **Tutor** for MATH 1091 Linear Algebra I (Maths Hons)

2023 **Tutor** for MATH 2011 Complex Analysis II (Maths Hons)

2021  **Lecturer** for Elementargeometrie für Lehramt (ca. 50 students)

2020 **Lecturer** for MATH 101:201 Integral Calculus with Applications to Physical Sciences and Engineering (ca. 150 students)

2019 **Lecturer** for MATH 100:108 Differential Calculus with Applications to Physical Sciences and Engineering (ca. 120 students)

2019 **Lecturer** for MATH 101:207 Integral Calculus with Applications to Physical Sciences and Engineering (ca. 90 students)


2018 **Lecturer** for MATH 100:102 Differential Calculus with Applications to Physical Sciences and Engineering (ca. 100 students)

2018 **Lecturer** for MAT 623/MAT 813 Topologie Algébrique (5 students)



- 2017 **Supervisor** for the Part Ib course *Geometry*
- 2015 **Supervisor** for the Part III course *Homotopy Theory*
- 2013 – 2016 **Supervisor** for the Part II course *Algebraic Topology*
- 2011 – 2012 **Student assistant** for the courses *Linear Algebra I and II*
- 2012 **Leader** of a mathematical study group *Schülerzirkel* for pupils at the University of Duisburg-Essen

## Mentoring


### postdoc

- since 2023 Subhankar Dey  (funded through my DFG individual research grant)







### master theses

- 2022 Ludovico Morellato: *Implementing the Sarkar-Wang nicefication algorithm*  (joint supervision with Lukas Lewark)
- 2021 Benedikt Aubeck: *Determining the Seifert genus via the Heegaard Floer tangle invariant HFT*  (joint supervision with Lukas Lewark)

### undergraduate summer research projects

- 2019 Gurkeerat Chhina: *Computing immersed curves in Khovanov homology* 
- 2016 Johnny Nicholson: *Comparing generalisations of the Alexander polynomial to tangles*

## Invited conference talks and lectures







- 2023  *Singularities and low-dimensional topology*, Erdős Centre, Budapest, HU
- 2022  *Frontiers in Geometry and Topology*, ICTP, Trieste, IT
- 2021 *Winter Meeting of the Canadian Mathematical Society*, CA/online
- 2021 *Richmond Geometry Festival*, VCU, US/online
- 2021  *Nearly Carbon Neutral Geometry and Topology Conference*, US/online
- 2021 *Summer Meeting of the Canadian Mathematical Society*, CA/online
- 2021  *Floer homology in low-dimensional topology*, Simons Center for Geometry and Physics, Stony Brook, US/online
- 2019 *Lecture series: Immersed curves in Khovanov homology* ( lecture notes) at the summer school *Current Progress in Low Dimensions*, Université du Québec à Montréal, CA
- 2019 *Sectional Meeting of the American Mathematical Society*, University of Hawai'i at Mānoa, US
- 2017 *Low-dimensional topology on Skye*, Sabhal Mòr Ostaig, UK
- 2017  *Homology theories in low dimensional topology*, Isaac Newton Institute, University of Cambridge, UK

## Invited seminar talks

- 2024 *Münster Topology Seminar*, University of Münster, DE
- 2024 *Low-Dimensional Topology Seminar*, MPIM Bonn, DE
- 2024 *Glasgow Topology Seminar*, University of Glasgow, UK
- 2023 *Oxford Topology Seminar*, University of Oxford, UK
- 2022 *Zürich Topology Seminar*, University of Zürich, CH
- 2022 *Seminar on low-dim. topology, gauge theory, and symplectic geometry*, Stony Brook, US
- 2022 *Oberseminar Geometrie und Topologie*, Göttingen, DE

- 2021 *Higher Invariants Oberseminar*, Regensburg, DE
- 2020  *Low-Dimensional Geometry and Topology Seminar*, Regensburg, DE
- 2020  *Trends in Low-Dimensional Topology*, Boston, US
- 2020 *Topology Seminar*, Durham, UK
- 2020 *Topology Seminar*, Glasgow, UK
- 2020 *Triangle Topology Seminar*, Duke, US
- 2020 *Geometry Seminar*, UGA, US
- 2019 *Geometry and Topology Seminar*, VCU, US
- 2019 *Joint Los Angeles Topology Seminar*, Caltech, US
- 2019 *Topology Seminar*, Indiana University Bloomington, US
- 2018 *Geometry and Topology Seminar*, University of Oregon, US
- 2018 *Geometry and Topology Seminar*, UC Davis, US
- 2017 *Topology Seminar*, Princeton University, US
- 2017 *Topology Seminar*, UCLA, US
- 2017 *Geometry and Topology Seminar*, Université du Québec à Montréal, CA
- 2015 *Geometry and Topology Seminar*, University of Glasgow, UK

### Administration and services to the mathematical community

- 2022 **Outreach Talk** , *Mathematik zum Anfassen*, Nacht.Schafft.Wissen , Regensburg, DE
- 2022 **Co-organizer** of the minisymposium *Algebra and Low-Dimensional Topology*  at the annual meeting of the German Mathematical Society (DMV), Berlin, DE
- 2022 **Acting proxy** for the Mittelbau (mid-level faculty) in a W3 Professorship Hiring Committee at the University of Regensburg
- 2021 **Co-organizer** of the SFB workshop and conference *Perspectives on quantum link homology theories* , Regensburg, DE
- 2018 **Co-organizer** of the topology session of the *Winter Meeting of the Canadian Mathematical Society* , Vancouver, CA
- 2018 **Principal organizer** of the ISM discovery school and CIRGET conference *Perspectives on bordered Heegaard Floer theory* , Montréal, CA
- since 2018 **Referee** for *Selecta Mathematica*, *Canadian Journal of Mathematics*, *Journal of Topology*, *Journal of Symplectic Geometry*, *Algebraic & Geometric Topology*, *Quantum Topology*, and *Indiana University Mathematics Journal*
- 2016 **Interviewer** for undergraduate admissions in economics at Trinity Hall
- 2014 **Interviewer** for undergraduate admissions in mathematics at Trinity Hall
- 2014 – 2015 **Organizer** of the student-run DPMMS seminar *Geometry Tea*

### Awards, scholarships and distinctions

- 2024 – 2029 **Starting Grant** (#101115822) from the European Research Council (ERC)
- 2022 – 2025 **Individual Research Grant** (#505125645) from the German Research Foundation (DFG)
- 2016 **Research studentship** from the Cambridge Philosophical Society
- 2015 **Smith-Rayleigh and Knight-Rayleigh Prize Essay**, Group 2
- 2013 – 2016 **EPSRC studentship** and **Department grant** for PhD studies
- 2013 **Bateman Scholarship** from Trinity Hall
- 2012 – 2013 **Graduate Scholarship** from the German Academic Exchange Service
- 2010 – 2011 **NRW Scholarship** of the University of Duisburg-Essen