Dr. Dennis Ulbrich

Website | **Email** | **LinkedIn**

Further contact data: on request

EDUCATION

Dr. rer. nat. – Mathematics
University of Bremen, Department of Mathematics   4.2017 — 9.2021

- PhD thesis: Ergodic theory of nonlinear waves in discrete and continuous excitable media
  - Advisors: **Prof. Dr. J. Rademacher**, **Prof. Dr. M. Keßeböhmer**
  - Referees: Prof. Dr. J. Rademacher (University of Bremen), **Prof. Dr. I. Melbourne** (Warwick University)
- cf. **MGP**

Brückenstipendium of the University of Bremen
University of Bremen, Department of Mathematics   4.2016 — 4.2017

- Further studies
- Extensions of the results of my Master's thesis
- Successful acquisition of third-party funding (DFG) for my PhD project

M.Sc. and B.Sc. in Mathematics
University of Bremen   until 4.2016

- M.Sc. thesis: Dynamics of the three-state 1D Greenberg-Hastings cellular automaton
  - Referees: Prof. Dr. J. Rademacher, **Dr. T. Samuel** (University of Exeter)
- B.Sc. thesis: Unerwartete Fehler bei bedingten Erwartungswerten und Wahrscheinlichkeiten
  - Referees: **Prof. Dr. W. Brannath** (University of Bremen), **Dr. K. Falk** (University of Kiel)

EMPLOYMENT

Research assistant
Hochschule Bremen, School of Electrical Engineering and Computer Science   2.2025 — 5.2025

- Project work: AI-based transmission, analysis and verification of handwritten documents

Lecturer in Mathematics
Hochschule Bremen, School of Nature and Engineering   10.2024 — 3.2025

- Mathematik 1

Postdoctoral researcher
University of Münster, Department of Mathematics, Institute for Analysis and Numerics
                                                                      6.2023 — 6.2024
- Research on discrete hypocoercivity within **DFG project 456849348**
- Keywords:
    - Hypocoercivity
    - Kinetic equations
    - BGK-type approximations
    - Chemical reactions
    - Entropy methods
- Supervision: **Prof. Dr. M. Pirner**

Non-academic professional activities
Bremen, Köln   9.2022 — 2.2023

Lecturer in Mathematics
Jacobs University Bremen, Mathematical Sciences   1.2022 — 6.2022

- Finite Mathematics
- Introduction to Dynamical Systems

Research assistant (PhD student)
University of Bremen, Department of Mathematics   4.2017 — 9.2021

Research groups: Nonlinear Analysis and Applied Analysis, Stochastics and Dynamical Systems

- Research within **DFG project number 384027439**
- PhD thesis: Ergodic theory of nonlinear waves in discrete and continuous excitable media:
    - Advisors: Prof. Dr. J. Rademacher, Prof. Dr. M. Keßeböhmer
    - Referees: Prof. Dr. J. Rademacher (University of Bremen), Prof. Dr. I. Melbourne (Warwick University)
- Keywords:
    - Nonlinear analysis
    - Ergodic Theory
    - PDE
    - Excitable media
    - Cellular automata
    - Dynamical Systems

PUBLICATIONS

IN PROGRESS

- Discrete hypocoercivity for a nonlinear kinetic reaction model without initial close-to-equilibrium assumption. (working title)
  joint work with **L. Liu** and **M. Pirner**

REFEREED JOURNAL ARTICLES

- A. Pauthier, J.D.M. Rademacher, D. Ulbrich.
  Weak and strong interaction of excitation kinks in scalar parabolic equations.
  J Dyn Diff Equat. Published 30 July 2021; Volume 35, pages 2199-2235, (2023) **[DOI]**
  [arXiv]

- M. Keßeböhmer, J.D.M. Rademacher, D. Ulbrich.
  Dynamics and topological entropy of 1D Greenberg-Hastings cellular automata.
  Ergodic Theory and Dynamical Systems. 2021;41(5):1397-1430 [DOI] [arXiv]

THESES

- D. Ulbrich.
  Ergodic theory of nonlinear waves in discrete and continuous excitable media.
  Dissertation, 2021 [DOI]

OTHER

GRANTS

Brückenstipendium
University of Bremen, Department of Mathematics   4.2016 — 4.2017

- **More details**

SUPERVISION

Student research project
University of Bremen, Department of Mathematics   2021 — 2022

- Wave patterns in cellular automata for excitable media, see **here**

ORGANISATION

Administrational tasks
University of Bremen, Department of Mathematics   2016 – 2021

- Supporting several **summer and winter schools**
- Maintaining the Mathematical Collection of the University of Bremen and creating its website

IT SKILLS

- **LaTeX:** advanced
- **Matlab, Mathematica, Java, C++, Python, HTML, CSS, GitHub, Oracle PL/SQL:** basic
  - Oracle PL/SQL Fundamentals vol. I & II (Udemy, 2022)

LANGUAGES

- **German:** mother tongue
- **English:** C1

REFERENCES

On request