

Curriculum Vitae

Dr. Dennis Ulbrich

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Mathematician with research focus in nonlinear analysis, dynamical systems and kinetic theory; several years of teaching experience in undergraduate mathematics (including large-scale service courses such as “Mathematik 1”). Experienced in teaching, student supervision, and academic course organization.

Research interests

ODE and PDE and their dynamics, nonlinear waves, dynamical systems, ergodic theory, kinetic theory and entropy methods, Boltzmann equation and its BGK type approximations, long time behavior of solutions (hypocoercivity), physical applications, models of chemical reactions

Teaching experience

- **Mathematik 1** Bremen
Hochschule Bremen, School of Nature and Engineering 10.2024 – 3.2025
 - Lecture and tutorial, approx. 50 participants
 - Creation and correction of written exams
 - Creation of weekly exercise sheets
 - Organisation via online platform “AULIS”
- **Finite Mathematics** Bremen
Jacobs University Bremen, Mathematical Sciences 1.2022 – 6.2022
 - Lecture and tutorial, approx. 50 participants
 - Creation and correction of written exams
 - Creation of weekly exercise sheets
 - Organisation via Moodle
- **Introduction to Dynamical Systems** Bremen
Jacobs University Bremen, Mathematical Sciences 1.2022 – 6.2022
 - Proseminar, approx. 15 participants
 - Providing literature and further material
 - Grading final presentations of the participants

Employment

- **Research assistant** Bremen
Hochschule Bremen, School of Electrical Engineering and Computer Science 2.2025 – 5.2025
 - Project work: AI-based transmission, analysis, verification of handwritten documents
- **Lecturer in Mathematics** Bremen
Hochschule Bremen, School of Nature and Engineering 10.2024 – 3.2025
 - Mathematik 1 (cf. Teaching experience)
- **Postdoctoral researcher** Münster
Universität Münster, Fachbereich Mathematik, Institut f. Analysis u. Numerik 6.2023 – 6.2024
 - Research on discrete hypocoercivity within DFG project 456849348
 - Supervision: Prof. Dr. Marlies Pirner
 - Keywords:
 - * Hypocoercivity
 - * Kinetic equations
 - * BGK-type approximations
 - * Chemical reactions
 - * Entropy methods
- **IT-Consultant** Affinis AG Bremen
Professional internship 9.2022 – 2.2023
- **Lecturer in Mathematics** Bremen
Jacobs University Bremen 1.2022 – 6.2022
 - Finite Mathematics, Introduction to Dynamical Systems (cf. Teaching experience)
- **Research assistant (PhD student)** Bremen
University of Bremen, Department of Mathematics 4.2017 – 9.2021
 - Research within DFG project RA 27288/1-1
 - Research groups: Nonlinear Analysis and Applied Analysis, Stochastics and Dynamical Systems
 - PhD thesis: *Ergodic theory of nonlinear waves in discrete and continuous excitable media*
 - * *Advisors:* Prof. Dr. Jens Rademacher (University of Hamburg), Prof. Dr. Marc Keßeböhmer (University of Bremen)
 - * *Referees:* Prof. Dr. Jens Rademacher, Prof. Dr. Ian Melbourne (Warwick University)
 - Keywords:
 - * Nonlinear analysis
 - * Ergodic Theory
 - * PDE
 - * Excitable media
 - * Cellular automata
 - * Dynamical Systems

Education

- **Dr. rer. nat., Mathematics** Bremen
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. Jens Rademacher (University of Hamburg), Prof. Dr. Marc Keßeböhmer (University of Bremen)
 - Referees: Prof. Dr. Jens Rademacher, Prof. Dr. Ian Melbourne (Warwick University)
 - cf. MGP
- **Brückenstipendium** 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., Mathematics** Bremen
University of Bremen 10.2011 – 4.2016
 - M.Sc. thesis:
Dynamics of the three-state 1D Greenberg-Hastings cellular automaton
 - * Referees: Prof. Dr. Jens Rademacher, Dr. Tony Samuel (University of Exeter)
 - B.Sc. thesis:
Unerwartete Fehler bei bedingten Erwartungswerten und Wahrscheinlichkeiten
 - * Referees: Prof. Dr. Werner Brannath (University of Bremen), Dr. Kurt Falk (University of Kiel)

Publications

Peer-reviewed 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]

Ongoing work:

- L. Liu, M. Pirner, **D. Ulbrich**.
Discrete hypocoercivity for a nonlinear kinetic reaction model without initial close-to-equilibrium assumption.

Thesis:

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

Academic services/ academic responsibilities**Supervision:**

- Student research project, University of Bremen, Department of Mathematics, 2021 – 2022

Organisation:

- Supporting several summer and winter schools, University of Bremen, 2016 – 2021
- Maintaining the Mathematical Collection of the University of Bremen and creating its website

Grants

- Brückenstipendium, University of Bremen, Department of Mathematics, 4.2016 – 4.2017

IT skills

- LaTeX: advanced
- Matlab, Mathematica, Java, C++, Oracle PL/SQL: basic

Languages

- German: native speaker
- English: fluent

References/ certificates

on request