

# Dr. Dennis Ulbrich



[Email](#)

## 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. J. Rademacher](#), [Prof. M. Keßeböhmer](#)
  - Referees: Prof. J. Rademacher (University of Bremen), [Prof. I. Melbourne](#) (Warwick University)
- cf. [MGP](#)

### Brückensтипендиум der Universität 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. J. Rademacher, [Dr. T. Samuel](#) (University of Exeter)
- B.Sc. thesis: Unerwartete Fehler bei bedingten Erwartungswerten und Wahrscheinlichkeiten
  - Referees: [Prof. W. Brannath](#) (University of Bremen), [Dr. K. Falk](#) (University of Kiel)

## EMPLOYMENT

### Postdoctoral researcher

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. 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. J. Rademacher](#), [Prof. M. Keßeböhmer](#)
- Referees: Prof. J. Rademacher (University of Bremen), [Prof. 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. Ulrich.  
Ergodic theory of nonlinear waves in discrete and continuous excitable media.  
Dissertation, 2021 [[DOI](#)]

## OTHER

### GRANTS

#### Brückensтипендиум

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