

# 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. Keßeböhrer](#)
  - Referees: Prof. J. Rademacher (University of Bremen), [Prof. 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. 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. 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