

# Lukas Niebel

## Curriculum Vitae

Postdoctoral researcher  
University of Münster  
✉ [lukas.niebel@uni-muenster.de](mailto:lukas.niebel@uni-muenster.de)  
🌐 [lukasniebel.github.io](https://lukasniebel.github.io)

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### Education

- 04/2019–06/2023 **PhD Mathematics**, *Ulm University*  
Thesis: Analytic aspects of kinetic partial differential equations.  
Advisor: Prof. Dr Rico Zacher.  
Referees: Prof. Dr Cyril Imbert, Prof. Dr Hongjie Dong.  
Grade: Summa cum laude, awarded by the Ulmer Universitätsgesellschaft.
- 03/2018–03/2019 **M.Sc. Mathematics**, *Ulm University*  
Thesis: Kolmogorov equations – Well-posedness, regularity, asymptotics and Harnack inequalities.  
Grade: 1.0 with distinction, awarded for the best graduation.
- 10/2014–02/2018 **B.Sc. Mathematics**, *Ulm University*  
Thesis: Long-time behaviour of Markov chains by discrete functional inequalities and entropic Ricci curvature.  
Grade: 1.1 with distinction, awarded for the best graduation.
- 04/2013–09/2014 **Junior studies in mathematics**, *Fernuniversität Hagen and PFH Göttingen*  
06/2014 **Abitur**, *Joachim-Hahn-Gymnasium Blaubeuren*

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### Employment History

- 04/2023–present **Postdoctoral researcher in the group of Prof. Dr Christian Seis**, *University of Münster*
- 10/2022–03/2023 **Predocctoral researcher**, *Ulm University*
- 03/2020–10/2022 **Teaching assistant**, *University of Applied Sciences Neu-Ulm*
- 10/2015–10/2019 **Teaching assistant**, *Ulm University*
- 03/2015–03/2019 **Research assistant (working student)**, *Daimler AG Research & Development Ulm*

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### Research

#### Preprints

- [1] **Global rigidity of two-dimensional bubbles**. arXiv:2510.17557, 2025.
- [2] **Critical trajectories in kinetic geometry** in collaboration with Helge Dietert, Clément Mouhot, and Rico Zacher. arXiv:2508.14868, 2025.
- [3] **Weak solutions to Kolmogorov–Fokker–Planck equations: regularity, existence and uniqueness** in collaboration with Pascal Auscher and Cyril Imbert. arXiv:2403.17464, 2024.

#### Publications

- [4] **Steady bubbles and drops in inviscid fluids** in collaboration with David Meyer and Christian Seis. *Calc. Var.*, 64(299), 2025.
- [5] **A trajectorial interpretation of Moser’s proof of the Harnack inequality** in collaboration with Rico Zacher. *Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)*, 26(2):605–617, 2025.
- [6] **Fundamental solutions to Kolmogorov–Fokker–Planck equations with rough coefficients: existence, uniqueness, upper estimates** in collaboration with Pascal Auscher and Cyril Imbert. *SIAM J. Math. Anal.*, 57(2):2114–2137, 2025.
- [7] **On a kinetic Poincaré inequality and beyond** in collaboration with Rico Zacher. *J. Funct. Anal.*, 289(1):Paper No. 110899, 18, 2025.
- [8] **Kinetic maximal  $L^p$ -regularity with temporal weights and application to quasilinear kinetic diffusion equations** in collaboration with Rico Zacher. *J. Differential Equations*, 307:29–82, 2022.
- [9] **Kinetic maximal  $L^p_\mu(L^p)$ -regularity for the fractional Kolmogorov equation with variable density**. *Nonlinear Anal.*, 214:Paper No. 112517, 21, 2022.

- [10] **Kinetic maximal  $L^2$ -regularity for the (fractional) Kolmogorov equation** in collaboration with Rico Zacher. *J. Evol. Equ.*, 21(3):3585–3612, 2021.

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## Teaching Experience

### University of Münster

- 2023–2025 Teaching assistant for *Partial Differential Equations* (1 sem.) and *Analysis and Numerics of Differential Equations* (1 sem.) (exercise-sheet design; large-class solution sessions; tutor and marking coordination; exam support).
- Winter 2024 Supervised a student seminar on *De Giorgi–Nash–Moser Theory*.
- 2024–2025 Refereed a BSc thesis; co-supervised and refereed the MSc thesis of Yuanjiang Han (now a PhD student with Christian Seis).

### University of Applied Sciences Neu-Ulm

- 2020–2022 Teaching assistant for *Business Mathematics and Statistics I* (3 sem.) and *Business Mathematics and Statistics II – Regression Models / Statistical Testing* (2 sem.) (authored exercise sheets; ran the programming lab; marked submissions).

### Ulm University

- 2017–2022 Teaching assistant for *Analysis I* (2 sem.), *Analysis II* (1 sem.), *Dynamical Systems* (2 sem.), and *Elements of Functional Analysis* (1 sem.) (exercise-sheet design; large-class solution sessions; tutor and marking coordination; exam-setting support).
- Winter 2022 Local coordinator of the 26th Internetseminar.
- Winter 2019 Organised the “Trainingscamp”, an annual four-week maths skills refresher for first-year students.
- 2015–2017 Matlab tutor for *Analysis I* and *Analysis II*.

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## Awards and Scholarships

- 02/2025 PhD thesis award “Promotionspreis der Ulmer Universitätsgesellschaft” (1500 EUR).
- 06/2022 Travel grant by the ProTrainU Mobility-Programme, Ulm University (1000 EUR).
- 04/2022 Master graduation award “Absolventenpreis M.Sc. Mathematik Uni Ulm 2020” for the best graduation (500 EUR).
- 11/2019 Graduate scholarship granted by the State of Baden-Wuerttemberg, Germany (52,200 EUR).
- 05/2018 Bachelor graduation award “Absolventenpreis B.Sc. Mathematik Uni Ulm 2018” for the best graduation (500 EUR).
- 06/2014 Ferry Porsche award and graduation award of the Deutsche Physikalische Gesellschaft.

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## Talks and Posters

- 10/2025 Talk – Oberseminar Angewandte Analysis, Dortmund University.
- 10/2025 Talk – Noko25 43rd Northern German Colloquium on Applied Analysis and Numerical Mathematics, Humboldt-Universität zu Berlin.
- 09/2025 Poster – Hyperbolic Problems in Nürnberg 2025, FAU Erlangen.
- 05/2025 Talk – Seminar Nichtlineare Partielle Differentialgleichungen, KIT Karlsruhe.
- 03/2025 Poster – Kinetic equations and turbulence, CentraleSupélec and Collège de France.
- 10/2024 Talk – Münster–Imperial Day in PDE, University of Münster.
- 09/2024 Talk – Oberseminar Analysis, University of Bonn.
- 03/2024 Poster – Mathematics Münster Mid-term Conference, University of Münster.
- 11/2023 Talk – Séminaire Analyse Numérique et EDP, Université Paris-Saclay.
- 09/2023 Talk – Seminar of the AG Analysis-Probability, MPI Leipzig.
- 06/2023 Talk – Real Analysis and Geometry, CIRM Marseille.
- 04/2023 Talk – Wilhelm Killing Colloquium, University of Münster.
- 03/2023 Talk – Chair Dynamics Control and Numerics, FAU Erlangen.
- 02/2023 Talk – TULKKA, KIT Karlsruhe.
- 11/2022 Poster – Kinetic Theory, CIRM Marseille.

- 09/2022 Talk & Poster – Horizons in non-linear PDEs, Ulm University.
- 07/2022 Poster – When Kinetic Theory meets Fluid Mechanics, ETH Zürich.
- 06/2022 Poster – 11th Summer school on “Methods and Models of Kinetic Theory”, Pesaro.
- 01/2022 Poster – Frontiers in analysis of kinetic equations, INI Cambridge.
- 07/2021 Talk – Nonlinear Evolution Equations and Approximations, University of Duisburg-Essen.
- 03/2021 Talk – Oberseminar Analysis, Ulm University.
- 02/2021 Poster – Winterschool on Analysis and Applied Mathematics, University of Münster.

## Research Stays

- 2026 Invited by David Herzog (Iowa State University), two weeks.
- 2023–2025 Multiple visits to Pascal Auscher (Université Paris-Saclay), totaling 7 weeks.
- 2023–2025 Multiple visits to Rico Zacher (Ulm University), totaling 5 weeks.
- 2021–2025 Three visits to Cyril Imbert (École normale supérieure, Paris), totaling two weeks.
- 05/2025 Visit to Björn de Rijk (KIT Karlsruhe), one week.
- 09/2023 Visit to Tobias Ried (MPI Leipzig), one week.
- 03/2023 Visit to Nicola De Nitti (FAU Erlangen), one week.
- 02/2023 Visit to Christian Seis (University of Münster), half a week.

## Other Scientific Activities

- 10/2024 Supporting the organisation of the Münster–Imperial Day in PDE, University of Münster.
  - 09/2022 Supporting the organisation of the summer school “Horizons in non-linear PDEs” at Ulm University.
  - 03/2020 Co-organisation of the seminar “Mathematisches Kolloquium” at Ulm University for six semesters.
  - 06/2022 Organisation of a workshop for PhD students in mathematics at Ulm University. One weekend, 15 participants, funding (2500 EUR) acquired by the StuVe Ulm University.
  - 03/2022 Supervision of a three-month project for the workshop of the 25th Internetseminar. Title: Kolmogorov equation in  $L^p(\mathbb{R}^{2n})$  – Semigroup, spectrum, maximal regularity?
  - 10/2021 Facilitator at the autumn school “COLLAB – Collaboratory for Global Sustainability 2021”, Toronto/Ulm.
  - 11/2019 Supporting the organisation of the winter school “Grad. Flows and Var. Methods in PDEs” at Ulm University.
- Active contribution to the PDE seminars at the University of Münster and Ulm University by inviting several external speakers.
- Attended over 30 international workshops and conferences, including events at CIRM Marseille, INI Cambridge, ETH Zürich, and the University of Oxford.
- Refereeing activity for *Communications in Partial Differential Equations*, *Annales scientifiques de l'École normale supérieure*, *Discrete and Continuous Dynamical Systems*, *European Journal of Mathematics*, and *Journal of Evolution Equations*.

## Academic Volunteer Work

- 02/2021–09/2022 **Elected member of the council of PhD students, Ulm University, Ulm**  
Representing the interests of doctoral students in university committees, e.g. for the change of the PhD regulations. Chair of the council of PhD students (12/2021–09/2022).
- 02/2021–09/2022 **Elected member of the faculty council for Mathematics and Economic Sciences, Ulm University, Ulm**
- 07/2017–03/2019 **Member of the Student Council Mathematics, Ulm University, Ulm**  
Member of the appointment committee for a professorship in “Stochastics”.