Room E.01
Helmholtzstr. 18
89081 Ulm, Germany

Lukas Niebel

PhD Student at Ulm University

+49 157 83632890
lukasniebel.github.io
niebel.math@gmail.com

I am a PhD student at Ulm University under the supervision of Prof. Rico Zacher. My research concerns the regularity theory of linear and nonlinear kinetic partial differential equations. I am interested in a precise L^p-solution theory for linear kinetic PDE and in understanding a priori estimates for weak solutions of kinetic PDE. The goal is to apply these results to nonlinear kinetic partial differential equations such as the Boltzmann and Landau equations. Preprints of all publications are available on arXiv.

Publications

Kinetic maximal L^p-regularity with temporal weights and application to quasilinear kinetic diffusion equations 2022
*with Rico Zacher, Journal of Differential Equations, **307**, p. 29–82*, link to the article.

Kinetic maximal $L^p_\mu(L^p)$-regularity for the fractional Kolmogorov equation with variable density 2022
*Nonlinear Analysis, **214***, link to the article.

Kinetic maximal L^2-regularity for the (fractional) Kolmogorov equation 2021
*with Rico Zacher, Journal of Evolution Equations, **21**, p. 3585–3612*, link to the article.

Education

PhD student **2019 — 2022**
Ulm University

- Working title: Analytic aspects of kinetic partial differential equations
- Advisor: Prof. Dr. Rico Zacher
- My studies are funded by a graduate scholarship (grant number 1902 LGFG-E).

M.Sc. Mathematics **2018 — 2019**
Ulm University

- Thesis: Kolmogorov equations - Well-posedness, regularity, asymptotics and Harnack inequalities
- Grade: 1.0 with distinction, awarded for best graduation
- During my master's studies, I focused on Analysis, by taking courses on the calculus of variations, evolution equations, functional calculus, partial differential equations and optimal transport. This was supported by courses in applied mathematics, such as numerical finance, as well as a series of lectures on econophysics.

B.Sc. Mathematics **2014 — 2018**
Ulm University

- Thesis: Long-time behavior of Markov chains by discrete functional inequalities and entropic Ricci curvature
- Grade: 1.1 with distinction, awarded for best graduation

Abitur, *Joachim-Hahn-Gymnasium Blaubeuren* 2014
Junior studies in mathematics, *Fernuniversität Hagen and PfH Göttingen* 2013 — 2014

Working and Teaching Experience

Scientific assistant **2020 — 2022**
University of Applied Sciences Neu-Ulm (HNU) *Neu-Ulm, Germany*

- Design and supervision of a supplementary course on statistics and applications for first-year students with an emphasis on programming in R.

Working student **2015 — 2019**
Daimler AG Research & Development *Ulm, Germany*

- Statistical Analysis with Matlab and Excel.
- Supervising the operation of a quasi-static tension-compression testing machine.

Scientific assistant **2017 — 2019**
Ulm University *Ulm, Germany*

- Head of teaching assistants for Analysis 1, Analysis 2, Dynamical Systems, Elements of Functional analysis; Creation and presentation of exercises supplementary to the lectures, responsible for the student assistants.
- Organisation of the Trainingscamp, a yearly event for first-year students to refresh their mathematical skills.

Student assistant **2015 — 2017**
Ulm University *Ulm, Germany*

- Tutor for the Mathlab Analysis 1 and Analysis 2.

Awards and Scholarships

Travel grant by the ProTrainU Mobility-Programm, Ulm University (1000 €) 2022
Master graduation award "Absolventenpreis M.Sc. Mathematik Uni Ulm 2020" for the best graduation 2022
Graduate scholarship granted by the State of Baden-Wuerttemberg, Germany (grant number 1902 LGFG-E) 2019 — 2022
Bachelor graduation award "Absolventenpreis B.Sc. Mathematik Uni Ulm 2018" for the best graduation 2018
Ferry Porsche Award and graduation award of the "Deutsche Physikalische Gesellschaft" 2014

Volunteer Work

Elected member of the council of PhD students at Ulm University 2020 — 2022
Representing the interests of doctoral students in university committees, e.g. for the change of the PhD regulations. Since 12/2021, chair of the PhD council.
Elected member of the faculty council for Mathematics and Economic Sciences of Ulm University 2020 — 2022
Member of the Academic Student Council Mathematics 2017 — 2019
e.g. member of the appointment committee for a professorship in "Stochastics"

Other Scientific Activities

Co-organisation of the seminar "Mathematisches Kolloquium" at Ulm University 2020 — 2022
Series of talks (five per term) at which researchers are invited to give a talk accessible to a broad audience
Organisation of a mini-workshop for PhD students in mathematics at Ulm University 2022
One Weekend, 15 Participants, Funding (approx. 2000 €) acquired by the Proko Ulm University
Supervision of a project for the workshop of the 25th Internetseminar 2022
Title: Kolmogorov equation in $L^p(\mathbb{R}^{2n})$ – Semigroup, spectrum, maximal regularity?
Research stay at Prof. Dr. Cyril Imbert, École normale supérieure Paris, one week 2021
Facilitator at the autumn school "COLLAB – Collaboratory for Global Sustainability 2021" 2021

Talks and Posters

Poster — 11th Summer school on "Methods and Models of Kinetic Theory", Pesaro 2022
Poster — Frontiers in analysis of kinetic equations, INI Cambridge 2022
Talk — Nonlinear Evolution Equations and Approximations, Essen 2021
Talk — Oberseminar Analysis, Ulm 2021
Poster — Winterschool on Analysis and Applied Mathematics, Münster 2021

Attended Conferences

25th Internetseminar "Spectral Theory for Operators and Semigroups", Agropoli 2022
11th Summer school on "Methods and Models of Kinetic Theory", Pesaro 2022
Oxbridge PDE Conference, Oxford (virtual) 2022
Frontiers in the Interplay Between Probability and Kinetic Theory, Edinburgh 2022
Kinetic Theory: old and new tutorial, INI Cambridge (virtual) 2022
Frontiers in analysis of kinetic equations, INI Cambridge (virtual) 2022
Deep Learning and partial differential equations, INI Cambridge (virtual) 2021
Recent advances in Gradient Flows, Kinetic Theory, and Reaction-Diffusion Equations, Vienna (virtual) 2021
Kinetic Equations: from Modeling Computation to Analysis, CIRM Marseille (virtual) 2021
Winterschool on Analysis and Applied Mathematics, Münster (virtual) 2021
PDE/Probability Interactions: Particle Systems, Hyperbolic Conservation Laws, CIRM Marseille 2019
Parabolic Evolution Equations, Harmonic Analysis And Spectral Theory, Bad Herrenalb 2019
Non Standard Diffusions in Fluids, Kinetic Equations and Probability, CIRM Marseille 2018
Evolution Equations in Ulm, Ulm 2018

Skills

Communication German (native speaker), English (C1), French (B1)
IT Skills C++, Excel (VBA), Java, LaTeX, Mathematica, Matlab, R, Swift
Advanced understanding of software and hardware