

Curriculum vitae: Dr. math. Marco Rehmeier

I was born on 10.07.1993 in Herford, Germany.

Contact

E-mail: mrehmeier@math.uni-bielefeld.de

Office: V4-128, University main building, Bielefeld

Address: Fakultät für Mathematik, Universität Bielefeld, Universitätsstraße 25, 33615 Bielefeld, Germany

Research Interests

Probability theory and stochastic analysis, in particular: Nonlinear Fokker-Planck-Kolmogorov equations and nonlinear Markov processes; Convex integration for fluid dynamical (S)PDEs; Stochastic effects on fluid dynamical PDEs.

Positions

- since 03.2024:** Postdoc (Wissenschaftlicher Mitarbeiter)
CRC 1283, Project A5 *Fokker-Planck-Kolmogorov equations on general state spaces*
Stochastic Analysis group, Prof. Dr. Michael Röckner, Bielefeld University
- 06.2023-02.2024:** Walter-Benjamin-Postdoc (funded by German Research Foundation)
Prof. Franco Flandoli, Scuola Normale Superiore Pisa
- 10.2021-05.2023:** Postdoc (Wissenschaftlicher Mitarbeiter)
CRC 1283, Project A5 *Fokker-Planck-Kolmogorov equations on general state spaces*
Stochastic Analysis group, Prof. Dr. Michael Röckner, Bielefeld University
- 05.2021-06.2021:** Research stay at Seoul National University
Research group Prof. Dr. Seung-Yeal Ha
- 10.2018-09.2021:** PhD student in the IRTG 2235 Bielefeld-Seoul, Bielefeld University
Speaker of the IRTG 2235-PhD fellows
Advisor: Prof. Dr. Michael Röckner
Thesis defended on 28.09.2021 (summa cum laude)

Education

- 10.2016-09.2018:** Study of Mathematics, Bielefeld University
Master of Science (Grade: 1.0, awarded price for best degree in mathematics)
- 10.2013-09.2016:** Study of Mathematics (major) and Economics (minor), Bielefeld University
Bachelor of Science (Grade: 1.0, awarded price for best degree in mathematics)
- 08.2004-06.2013:** Rudolph-Brandes-Gymnasium, Bad Salzuflen, Germany
Degree: Abitur (Grade: 1.0, awarded price for best degree)

Teaching and Supervision

- 2024 (summer):** Lecturer for *Fokker-Planck equations* (Bielefeld)

2023 (winter): Lecturer for *Introduction to Convex integration* (Pisa)

2022 (summer): Lecturer for *Selected Topics from Probability Theory* (Bielefeld)

since 10.2015: Teaching assist and tutor for the courses:

Analysis I+II, Linear Algebra I, Measure Theory, Stochastics, Functional Analysis, Probability Theory, Stochastic Analysis

Supervision Bachelor theses:

Representation theorems for linear functionals (A. Kniazev)

Kolmogorovscher Erweiterungssatz und Stetigkeitssatz von Kolmogorov-Tschenow (B. Bitterlich)

Fraktionale Brownsche Bewegung: Konstruktion und Eigenschaften (A. Heide)

Master theses: I currently supervise two master thesis on the topics

Nonlinear Markov processes

Nonlinear Fokker–Planck equations on manifolds as gradient flows

Publications and Preprints

6. **Emergence of phase-locked states for a deterministic and stochastic Winfree model with inertia**, with Myeongju Kang
Commun. Math. Sci., 21(7), 1875-1894 (2023)
5. **Nonuniqueness in law for stochastic hypodissipative Navier–Stokes equation**, with Andre Schenke
Nonlinear Anal., 227, 113179 (2023)
4. **Flow selections for (nonlinear) Fokker-Planck-Kolmogorov equations**
J. Differential Equations, 328, 105-132 (2022).
3. **Linearization and a superposition principle for deterministic and stochastic nonlinear FPK equations**
Ann. Sc. Norm. Super. Pisa Cl. Sci., 24(3), 1705-1739 (2023)
2. **Existence of flows for linear Fokker-Planck-Kolmogorov equations and its connection to well-posedness**
J. Evol. Equ., 21(1), 17-31 (2021)
1. **On Cherny’s results in infinite dimensions: A theorem dual to Yamada-Watanabe**
Stoch. Partial Differ. Equ. Anal. Comput., 9, 33–70 (2021)

Preprints

11. **Remarks on regularization by noise, convex integration and spontaneous stochasticity**, with Franco Flandoli (2024)
available under: arXiv:2402.16525
10. **Average dissipation for stochastic transport equations with Lévy noise**, with Franco Flandoli and Andrea Papini (2024)
available under: arXiv:2402.08461
9. **Weighted L^1 -semigroup approach for nonlinear Fokker–Planck equations and generalized Ornstein–Uhlenbeck processes** (2023)
available under: arXiv:2308.09420

8. **Nonlinear Fokker–Planck–Kolmogorov equations as gradient flows on the space of probability measures**, with Michael Röckner (2023)
available under: arXiv:2306.09530
7. **On nonlinear Markov processes in the sense of McKean**, with Michael Röckner
available under: arXiv:2212.12424 (2022)

Theses

2. **Nonuniqueness of Laws on State and Path Space: Flow Selections and Superposition for Fokker–Planck–Kolmogorov Equations and Convex Integration for Stochastic Hypodissipative Navier–Stokes Equations**
PhD thesis (2021), available here
1. **On Cherny’s results in infinite dimensions: A theorem dual to Yamada–Watanabe**
Master thesis (2018), available on request

Talks

- On nonlinear Markov processes in the sense of McKean (Berlin, Feb24)
 - On nonlinear Markov processes in the sense of McKean (Leipzig, Jan24)
 - Weighted L^1 -semigroup approach for nonlinear Fokker–Planck equations and generalized Ornstein–Uhlenbeck processes (Bielefeld, Nov23)
 - Nonlinear Fokker–Planck–Kolmogorov equations as gradient flows on the space of probability measures (Hammamet, Oct23)
 - On nonlinear Markov processes in the sense of McKean (Hofgeismar, Aug23)
 - On nonlinear Markov processes in the sense of McKean (Lisbon, Jul23)
 - On nonlinear Markov processes in the sense of McKean (Wilmington, Jun23)
 - On nonlinear Markov processes in the sense of McKean (Münster, Jun23)
 - On nonlinear Markov processes in the sense of McKean (Essen, Mar23)
 - On nonlinear Markov processes in the sense of McKean (Pisa, Feb23)
 - On nonlinear Markov processes in the sense of McKean (Bielefeld, Feb23)
 - Superposition for deterministic and stochastic nonlinear Fokker–Planck–Kolmogorov equations (Hammamet, Oct22)
 - Linearization and a superposition principle for deterministic and stochastic nonlinear Fokker–Planck–Kolmogorov equations (Bielefeld, Sep22)
 - Emergence of phase-locked states for a Winfree model with inertia (Bielefeld, Jul22)
 - Nonuniqueness in law for stochastic hypodissipative Navier–Stokes equations (Barcelona, May22)
 - Flow selection for (nonlinear) Fokker–Planck–Kolmogorov equations (Bielefeld, Jan22)
 - Nonuniqueness in law for stochastic hypodissipative Navier–Stokes equations (Seoul, May21)
 - Superposition principle for stochastic nonlinear Fokker–Planck–Kolmogorov equations (Seoul, May21)
 - From Interacting Particle Systems to Nonlinear Fokker–Planck equations (Bielefeld, Oct20)
 - On Cherny’s results in infinite dimensions: A theorem dual to Yamada–Watanabe (Karlsruhe, Sep19)
 - Introduction to quasi-stationary distributions and first general properties (Bielefeld, Aug19)
 - Existence of flows for linear FPK-equations and its connection to well-posedness (Essen, Jun19)
 - On Cherny’s results in infinite dimensions: A theorem dual to Yamada–Watanabe (Bielefeld, Mar19)
- + further talks in Bielefeld, including the mini lecture series *Convex Integration for fluid dynamical PDEs and its origin in Nash’s C^1 isometric embedding theorem*

Attendance at Conferences and Seminars

- Organizer of the BGTS (Bielefeld Graduate School in Theoretical Sciences) Doctoral Day 2020

- Turbulence on the Banks of the Arno (Pisa, Jan24)
- Stochastic in Mathematical Finance and Physics (Hammamet, Oct13)
- CRC 1283 Retreat 2023 (Hofgeismar, Aug23)
- 43th Conference on Stochastic Processes and Applications (Lisbon, Jul23)
- 13th AIMS International Conference on Dynamical Systems, Differential Equations and Applications (Wilmington, May23)
- German Statistics and Probability Days 2023 (Essen, Mar23)
- 10th Bielefeld-SNU Joint Workshop in Mathematics (Bielefeld, Feb23)
- Recent Developments in Stochastics with Applications in Mathematical Physics and Finance (Hammamet, Oct22)
- Japanese-German conference on stochastic analysis and applications (Münster, Sep22)
- The SPDEvent (Bielefeld, Sept22)
- Stochastic Analysis and SPDEs (Barcelona, May22)
- Workshop Fractional Differential Equations (Isaac Newton Institute, Cambridge, Apr22)
- Eighth Bielefeld-SNU Joint Workshop in Mathematics (Bielefeld, Feb20)
- Touch down of stochastic analysis in Bielefeld (Bielefeld, Sep2019)
- Annual DMV-Conference 2019 (Karlsruhe, Sep19)
- IRTG Summer School on probability theory and stochastic dynamics (Bielefeld, Aug19)
- 29. Jyväskylä Summer School on Selected Topics in the Theory of BSDEs (Jyväskylä, Aug19)
- Recent Trends in Stochastic Analysis and SPDEs (Pisa, Jul19)
- 41. Nordwestdeutsches Funktionalanalysis-Kolloquium (Essen, Jun19)
- Seventh Bielefeld-SNU Joint Workshop in Mathematics (Bielefeld, Feb19)
- Winter School on Stochastic PDEs and Mean Field Games (Bologna, Jan19)
- 9th International Conference on Stochastic Analysis and Its Applications (Bielefeld, Sep18)

Organization of Events

10.2020 : Organizer of the *2020 BGTS Doctoral Day* (Bielefeld)

06.2024 : Organizer of the *Young Midsummer School on Stochastic Analysis* (Växjö)

Grants and Funding

06.2023-02.2024: Walter-Benjamin fellowship (German Research Foundation)
spent with Prof. Franco Flandoli, Scuola Normale Superiore, Pisa

04.2018: Price for best tutorial in mathematics ("Tutorenpreis") (Bielefeld University)

10.2015-09.2017: Scholarship for academic excellence (German Ministry for Education and Research)

Service

- Review work for: Springer Lecture Series in Mathematics, J. Evol. Equ., Potential Anal.
- Member of a tenure track-professorship evaluation committee

last update: 15.03.2024