

# LUKAS TROTTNER

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## EMPLOYMENT

|   |                       |
|---|-----------------------|
| Assistant Professor (TT), Chair of Mathematical Statistics, University of Stuttgart | since Oct. 2025       |
| Assistant Professor, School of Mathematics, University of Birmingham                | Sep. 2024 – Oct. 2025 |
| Postdoc, Department of Mathematics, Aarhus University                               | Sep. 2021 – Sep. 2024 |

## EDUCATION

|   |             |
|---|-------------|
| University of Mannheim  |             |
| PhD in Mathematics (Dr. rer. nat.)  | 2018 – 2021 |
| Thesis: <i>Implications of Markov stability theory for nonparametric statistics, Markov additive fluctuations and data-driven stochastic control</i> , Advisor: Prof. Dr. Leif Döring, grade: summa cum laude |             |
| MSc in Mathematics in Business and Economics  | 2016 – 2018 |
| Thesis: <i>Lamperti transformation for self-similar Markov processes</i> , first class honors (1.0)   |             |
| BSc in Mathematics in Business and Economics  | 2012 – 2016 |
| Thesis: <i>Verzweigungsprozesse: Aussterben einer Population</i> , first class honors (1.1)   |             |

## RESEARCH INTERESTS

Generative models, statistics for stochastic processes, concentration of measure, transfer learning, MCMC, data-driven stochastic optimal control, high-dimensional statistical inference, Lévy processes and Markov additive processes

## PUBLICATIONS

### Journal articles

Change point estimation for a stochastic heat equation (with Markus Reiß and Claudia Strauch)  
*Annals of Statistics*. to appear, arXiv:[2307.10960](https://arxiv.org/abs/2307.10960)

Multivariate change estimation for a stochastic heat equation from local measurements (with Anton Tiepner)  
*Stochastic Processes and their Applications* 192 (2026), paper no. 104832, doi: [10.1016/j.spa.2025.104832](https://doi.org/10.1016/j.spa.2025.104832)

Mini-Workshop: Statistical Challenges for Deep Generative Models  
(with Søren Christensen, Alain Oliveiro-Durmus and Claudia Strauch)  
*Oberwolfach Reports* 22 (2025), no. 1, pp. 375–403, doi: [10.4171/owr/2025/8](https://doi.org/10.4171/owr/2025/8)

Data-driven rules for multidimensional reflection problems (with Søren Christensen and Asbjørn Holk Thomsen)  
*SIAM/ASA Journal on Uncertainty Quantification* 12 (2024), no. 4, pp. 1240–1272, doi: [10.1137/23M1618570](https://doi.org/10.1137/23M1618570)

Markov additive friendships (with Leif Döring and Alex Watson)  
*Transactions of the American Mathematical Society* 377 (2024), no. 11, pp. 7699–7752, doi: [10.1090/tran/9266](https://doi.org/10.1090/tran/9266)

The uniqueness of the Wiener–Hopf factorisation of Lévy processes and random walks  
(with Leif Döring, Mladen Savov and Alex Watson)  
*Bulletin of the London Mathematical Society* 56 (2024), no. 9, pp. 2951–2968, doi: [10.1112/blms.13112](https://doi.org/10.1112/blms.13112)

Covariate shift in nonparametric regression with Markovian design  
*Information and Inference* 13 (2024), no. 2, paper no. iaiae011. doi: [10.1093/imaiia/iaae011](https://doi.org/10.1093/imaiia/iaae011)

Learning to reflect: A unifying approach for data-driven stochastic control strategies (with S. Christensen and C. Strauch)  
*Bernoulli* 30 (2024), no. 3, pp. 2074–2101. doi: [10.3150/23-BEJ1665](https://doi.org/10.3150/23-BEJ1665)

Stability of overshoots of Markov additive processes (with Leif Döring)  
*Annals of Applied Probability* 33 (2023), no. 6B, pp. 5413–5458. doi: [10.1214/23-AAP1951](https://doi.org/10.1214/23-AAP1951)

Concentration analysis of multivariate elliptic diffusions (with Cathrine Aeckerle-Willems and Claudia Strauch)  
*Journal of Machine Learning Research* 24 (2023), paper no. 106, pp. 1–38. ISSN: 1532-4435.

Adaptive invariant density estimation for continuous-time mixing Markov processes under sup-norm risk  
(with Niklas Dexheimer and Claudia Strauch)  
*Annales de l’Institut Henri Poincaré B (Probab. et Stat.)* 58 (2022), no. 4, pp. 2029–2064. doi: [10.1214/21-aihp1235](https://doi.org/10.1214/21-aihp1235)

## Preprints

Model-free filtering in high dimensions via projection and score-based diffusions (2025)

with Sören Christensen, Jan Kallsen and Claudia Strauch, arXiv:[2510.23197](https://arxiv.org/abs/2510.23197)

Beyond Fixed Horizons: A Theoretical Framework for Adaptive Denoising Diffusions (2025)

with Sören Christensen and Claudia Strauch, arXiv:[2501.01563](https://arxiv.org/abs/2501.01563)

Statistical guarantees for denoising reflected diffusion models (2025)

with Asbjørn Holk and Claudia Strauch, arXiv:[2411.01563](https://arxiv.org/abs/2411.01563)

## AWARDS AND SCHOLARSHIPS

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|   |             |
|---|-------------|
| Award for best master's degree in Mathematics, University of Mannheim   | 2018        |
| Award for best master's thesis in Mathematics, University of Mannheim   | 2018        |
| Award for best bachelor's degree in Mathematics, University of Mannheim | 2016        |
| Deutschlandstipendium, scholarship, University of Mannheim              | 2012 – 2018 |

## TEACHING

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### University of Stuttgart

#### Lecturing

|  |             |
|--|-------------|
| Mathematical Statistics  | Summer 2026 |
| Stochastik und angewandte Mathematik für das Lehramt (joint with Benjamin Stamm) | Winter 2025 |

### University of Birmingham

#### Lecturing

|  |             |
|--|-------------|
| Bayesian Inference and Computation (joint with Mengchu Li)   | Spring 2025 |
| Foundations of Statistical Inference (joint with Mengchu Li) | Fall 2024   |

#### Supervision

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|--|-------------|
| supervision of 8 MSc projects in Financial Risk Management | Summer 2025 |
|--|-------------|

### Aarhus University

#### Lecturing

|                                     |             |
|-------------------------------------|-------------|
| Statistics for Stochastic Processes | Spring 2024 |
| Statistics for Stochastic Processes | Spring 2022 |

#### Tutoring

|   |           |
|---|-----------|
| Introduction to Probability Theory and Statistics | Fall 2023 |
| Introduction to Probability Theory and Statistics | Fall 2022 |
| Calculus  | Fall 2021 |

### University of Mannheim

#### Supervision

|   |             |
|---|-------------|
| supervision of a Master thesis on Q-Learning and stochastic approximation | Spring 2021 |
|---|-------------|

#### Tutoring

|   |             |
|---|-------------|
| Introduction to Statistical Learning Theory | Fall 2019   |
| Analysis II                                 | Spring 2019 |
| Introduction to Mathematical Statistics     | Fall 2018   |
| Advanced Mathematical Finance               | Spring 2018 |
| Mathematical Finance                        | Fall 2017   |

## SUPERVISION OF PHD STUDENTS

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|   |                  |
|---|------------------|
| Simon Bienewald                                   | since Nov. 2025  |
| Asbjørn Holk Thomsen (joint with Claudia Strauch) | since April 2023 |

## RESEARCH GROUPS

|  |             |
|--|-------------|
| Member of Research Training Group 1953 “Statistical Modeling of Complex Systems”   | 2018 – 2021 |
| Research Assistant, Digital Economy, Leibniz Centre for European Economic Research | 2012 – 2017 |

## PROFESSIONAL ACTIVITIES

### Presentations and Seminars

|   |                       |
|---|-----------------------|
| IMS International Conference on Statist. and Data Science, Sevilla, <i>invited</i>                            | Dec. 2025             |
| Probab. Persp. in Neural Network Based Machine Learn., Math. Forschungsinst. Oberwolfach, <i>invited</i>      | Oct. 2025             |
| 11 <sup>th</sup> International Conference on Lévy Processes, Sofia, <i>invited</i>                            | July 2025             |
| Stochastic Partial Differential Equations: Statistics Meets Numerics, Institut Mittag-Leffler, <i>invited</i> | June 2025             |
| Frontiers of Statistics and Machine Learning, Mathematisches Forschungsinstitut Oberwolfach, <i>invited</i>   | March 2025            |
| SNU Workshop: Nonparametric Inference in the Age of AI, Seoul National University, <i>invited</i>             | Feb 2025              |
| Statistical Challenges for Deep Generative Models, Math. Forschungsinst. Oberwolfach, <i>invited</i>          | Feb. 2025             |
| Algorithms & Computationally Intensive Inference seminars, University of Warwick, <i>invited</i>              | Nov. 2024             |
| Statistics Seminar, University of Cambridge, <i>invited</i>   | Nov. 2024             |
| Mathematics Department Seminar, University of Siegen, <i>invited</i>  | Nov. 2024             |
| Data Science and Computational Statistics Seminar, University of Birmingham, <i>invited</i>                   | Nov. 2024             |
| 12 <sup>th</sup> World Congress of the Bachelier Finance Society, Rio de Janeiro                              | July 2024             |
| Institute of Statistics and Operations Research Colloquium, University of Vienna, <i>invited</i>              | April 2024            |
| Workshop on Stochastic Analysis and Statistics, Tokyo, <i>invited</i>   | Feb. 2024             |
| NeurIPS 2023, New Orleans, <i>poster</i>  | Dec. 2023             |
| 43 <sup>rd</sup> Conference on Stochastic Processes and their Applications, Lisbon, <i>two presentations</i>  | July 2023             |
| European Meeting of Statisticians 2023, Warsaw  | July 2023             |
| Informs APS 2023, Nancy, <i>invited</i>   | June 2023             |
| Stochastics Seminar, Aarhus University, <i>invited</i>  | April 2023            |
| German Probability and Statistics Days 2023, Essen  | March 2023            |
| SIAM Conference on Computational Science and Engineering 2023, Amsterdam, <i>invited</i>                      | March 2023            |
| Seminar Department of Mathematics, Kiel University, <i>invited</i>  | Nov. 2022             |
| Workshop on Statistics for Stochastic Processes, Luxembourg, <i>invited</i>                                   | Sep. 2022             |
| 10 <sup>th</sup> International Conference on Lévy processes, Mannheim, <i>invited</i>                         | July 2022             |
| International Symposium on Nonparametric Statistics, Paphos, <i>invited</i>                                   | June 2022             |
| Stochastics Seminar, Aarhus University, <i>invited</i>  | Nov. 2021             |
| German Probability and Statistics Days 2021, Mannheim   | Sep. 2021             |
| IRTG “Stochastic Analysis in Interaction”, Berlin Mathematical School, <i>invited</i>                         | June 2021             |
| Seminar Department of Mathematics, Kiel University, <i>invited</i>  | Dec. 2020             |
| Fifth Conference on Ambit Fields and Related Topics, Aarhus University, <i>invited</i>                        | Aug. 2020 (canceled)  |
| Bernoulli-IMS One World Symposium 2020  | Aug. 2020             |
| German Probability and Statistics Days 2020, Dresden  | March 2020 (canceled) |
| Mannheim meets Konstanz: Workshop in Statistics, University of Konstanz                                       | Dec. 2019             |
| GWOT ’19: Stochastic Modeling of Complex Systems, University of Heidelberg/Mannheim                           | April 2019            |
| Stochastics Seminar, University of Heidelberg/Mannheim  | March 2019            |

### Organization of scientific events

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|--|-----------|
| MFO Mini-Workshop on “Statistical Challenges for Deep Generative Models”, Oberwolfach          | Feb. 2025 |
| DYNSTOCH Satellite Summer School, Kiel   | May 2024  |
| Contributed session “High-dimensional statistics for stochastic processes” at SPA 2023, Lisbon | July 2023 |
| The Midsummer Lectures 2023  | June 2023 |
| Aarhus–Copenhagen Data Science Meeting 2022  | Dec. 2022 |

## **Research visits**

|   |            |
|---|------------|
| Heidelberg University, host: Claudia Strauch      | Nov. 2024  |
| University College London, host: Alex Watson      | March 2023 |
| Kiel University, host: Sören Christensen          | Nov. 2022  |
| Humboldt-Universität zu Berlin, host: Markus Reiß | Oct. 2022  |
| Humboldt-Universität zu Berlin, host: Markus Reiß | Aug. 2022  |

## **Summer/Spring/Fall Schools**

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|---|------------|
| SFB1294 Spring School on Data Assimilation, Döllnsee                                  | March 2022 |
| RTG1953 Fall School on Causal Inference and Stein's method, Mannheim                  | Nov. 2019  |
| Satellite Summer School to the 9th International Conference on Lévy Processes, Athens | July 2019  |

## **Refereeing**

*Annals of Statistics, Annales de l'Institut Henri Poincaré (Probab. et Stat.), Bernoulli, Electronic Journal of Probability, Information and Inference, Electronic Journal of Statistics, Electronic Communications in Probability, Inverse Problems, NeurIPS, Stochastic Processes and their Applications, Advances/Journal of Applied Probability, Annales Henri Lebesgue, ALEA, Annals of the Institute of Statistical Mathematics, Statistics*

## **Membership in Learned Societies**

*Deutsche Mathematikervereinigung*

Vita Date: 14 November 2025.