

# Maximilian Alexander Nitzschner

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## Curriculum Vitae

### Personal Details

Date of birth August 11, 1993  
Place of birth Dieburg, Germany  
Citizenship German

### Academic Positions

2023 – **Tenure-track Assistant Professor**, *The Hong Kong University of Science and Technology (HKUST)*, Hong Kong  
2020 – 2023 **Courant Instructor**, *NYU Courant Institute of Mathematical Sciences*, New York

### Education

2017 – 2020 **PhD in Mathematics**, *Eidgenössische Technische Hochschule (ETH)*, Zürich  
Thesis title: Solidification of porous interfaces, disconnection and entropic repulsion  
Advisor: Prof. Dr. Alain-Sol Sznitman  
2015 – 2016 **Master of Science in Mathematics**, *Ruprecht-Karls-Universität*, Heidelberg  
Thesis title: Estimation of characteristics of multidimensional diffusion processes based on low-frequency observations  
Advisors: Prof. Dr. Enno Mammen, Prof. Dr. Claudia Strauch  
Final grade: 1.0  
2014 – 2016 **Master of Science in Physics**, *Ruprecht-Karls-Universität*, Heidelberg  
Thesis title: A functional integral representation for the partition function of linearly coupled boson-fermion systems  
Advisor: Prof. Dr. Manfred Salmhofer  
Final grade: 1.0  
2013 – 2015 **Bachelor of Science in Mathematics**, *Ruprecht-Karls-Universität*, Heidelberg  
Thesis title: Theory and implementation of a local linear quantile estimator for nonstationary time series  
Advisor: Prof. Dr. Rainer Dahlhaus  
Final grade: 1.0  
2011 – 2014 **Bachelor of Science in Physics**, *Ruprecht-Karls-Universität*, Heidelberg  
Thesis title: Phase transitions and excitations in mixtures of Bose-Einstein condensates  
Advisor: Prof. Dr. Thomas Gasenzer  
Final grade: 1.0  
2003 – 2011 **Abitur**, *Humboldt-Gymnasium*, Wiesbaden  
Final grade: 1.0 (839/840)

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## External Grants, Scholarships and Fellowships

- 2025 – 2027 Hong Kong RGC Early Career Scheme (ECS) No. 26301824, Title: *Percolation and disconnection by level-set of the Gaussian free field and random interacements in random environments*, amount: 781,657 HKD.
- 2022 Oberwolfach Research Fellowship (2 weeks), Title: *Disconnection and excess deviations for the Gaussian free field and random walks*, jointly with A. Chiarini (University of Padova).
- 2013 – 2016 Scholarship of the German National Academic Foundation (*Studienstiftung des deutschen Volkes*).

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## Publications and Preprints

- 10 C. Gu, J.-C. Mourrat and M. Nitzschner: Quantitative equilibrium fluctuations for interacting particle systems, *Preprint*, also available at arXiv:2401.10080, 28 pages (2024).
- 9 A. Chiarini and M. Nitzschner: Lower bounds for bulk deviations for the simple random walk on  $\mathbb{Z}^d$ ,  $d \geq 3$ , *Preprint*, also available at arXiv:2312.17074, 49 pages (2023).
- 8 M. Nitzschner: Absence of weak disorder for directed polymers on percolation clusters, to appear in *Ann. Inst. Henri Poincaré (B) Probab. Stat.*, also available at arXiv:2205.06206, 18 pages (2022).
- 7 A. Chiarini and M. Nitzschner: Phase transition for level-set percolation of the membrane model in dimensions  $d \geq 5$ , *J. Stat. Phys.*, **190** (59), 30 pages (2023).
- 6 A. Giunti, C. Gu, J.-C. Mourrat and M. Nitzschner: Smoothness of the diffusion coefficients for particle systems in continuous space. *Commun. Contemp. Math.* **25** (3), 2250027, (2023).
- 5 A. Chiarini and M. Nitzschner: Disconnection and entropic repulsion for the harmonic crystal with random conductances, *Commun. Math. Phys.*, **386**, 1685–1745 (2021).
- 4 A. Chiarini and M. Nitzschner: Entropic repulsion for the occupation-time field of random interacements conditioned on disconnection, *Ann. Probab.* **48** (3), 1317–1351 (2020).
- 3 A. Chiarini and M. Nitzschner: Entropic repulsion for the Gaussian free field conditioned on disconnection by level-sets, *Probab. Theory Relat. Fields* **177** (1–2), 525–575 (2020).
- 2 M. Nitzschner: Disconnection by level sets of the discrete Gaussian free field and entropic repulsion, *Electron. J. Probab.* **23** (105), 1–21 (2018).
- 1 M. Nitzschner and A.-S. Sznitman: Solidification of porous interfaces and disconnection, *J. Eur. Math. Soc.* **22**, 2629–2672 (2020).

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## Talks and Poster Presentations

- June 2024 *Directed polymers on supercritical percolation clusters*. Invited session “Random surfaces”, 4<sup>th</sup> Italian Meeting on Probability and Mathematical Statistics, Rome.

- May 2024 *Directed polymers on supercritical percolation clusters*. Conference “Random Walks, Scaling Limits and Criticality”, Herrsching am Ammersee.
- May 2024 *Directed polymers on supercritical percolation clusters*. Probability & Statistics Seminar, University of Luxembourg.
- Apr 2024 *Directed polymers on supercritical percolation clusters*. HKUST-KAIST-NUS Joint Workshop, Korea Advanced Institute of Science and Technology, Daejeon.
- Mar 2024 *Bulk deviation lower bounds for the simple random walk*. Probability Seminar, NYU-ECNU Institute of Mathematical Sciences at NYU Shanghai, Online.
- Mar 2024 *Directed polymers on supercritical percolation clusters*. 1<sup>st</sup> NYUSH-Peking-Westlake Joint Conference on Probability, Westlake University.
- Jan 2024 *Bulk deviation lower bounds for the simple random walk*. Conference “Probability and Statistical Physics”, Tsinghua Sanya International Mathematics Forum.
- Dec 2023 *Bulk deviation lower bounds for the simple random walk*. Conference “Random Interacting Systems, Scaling Limits, and Universality”, Institute for Mathematical Sciences, National University of Singapore.
- Nov 2023 *Bulk deviation lower bounds for the simple random walk*. Hong Kong Probability Seminar, Hong Kong University of Science and Technology.
- July 2023 *Smoothness of the diffusion coefficients for particle systems in continuous space*. Thematic session “Strongly correlated particle systems”, Latin American Congress of Probability and Mathematical Statistics (XVI Clapem 2023), São Paulo.
- June 2023 *Bulk deviation lower bounds for the simple random walk*. Conference “Random walks in Bath”, University of Bath.
- June 2023 *Smoothness of the diffusion coefficients for particle systems in continuous space*. Stochastic Analysis and Large Scale Interacting System, Special Session of the 13th AIMS Conference on Dynamical Systems and Differential Equations, University of North Carolina, Wilmington.
- Mar 2023 *Bulk deviation lower bounds for the simple random walk*. Probability Seminar, Cornell University.
- Jan 2023 *Bulk deviation lower bounds for the simple random walk*. Oberseminar Mathematische Stochastik, Westfälische Wilhelms-Universität Münster.
- Dec 2022 *Level-set percolation and disconnection for Gaussian fields*. Global Young Scholars’ Forum, The Chinese University of Hong Kong, Shenzhen (CUHK-Shenzhen), Online.
- Dec 2022 *Level-set percolation and disconnection for Gaussian fields*. Winter Young Mathematician Forum, Shanghai Jiao Tong University, Online.
- July 2022 *Phase transition for level-set percolation of the membrane model*. Seminar in Probability and Finance, University of Padova.
- June 2022 *Smoothness of the diffusion coefficients for particle systems in continuous space*. Conference on Probability and Mathematical Physics, poster presentation, Helsinki.
- May 2022 *Entropic repulsion for the occupation-time field of random interacements conditioned on disconnection*. Workshop “Random Walk, Reinforcement and Localization”, CIRM Luminy.

- Feb 2022 *Phase transition for level-set percolation of the membrane model*. Probability and the City Seminar, New York University and Columbia University, Online.
- Jan 2022 *Phase transition for level-set percolation of the membrane model in dimensions  $d \geq 5$* . Percolation Today Seminar, ETH Zürich, Université de Lyon, Caltech, Online.
- Dec 2021 *Smoothness of the diffusion coefficients for particle systems in continuous space*. CASA Colloquium, TU Eindhoven, Online.
- Oct 2021 *Disconnection and entropic repulsion for the harmonic crystal with random conductances*. Probability and Stochastic Processes Seminar, University of Tennessee Knoxville, Online.
- Sep 2021 *Disconnection for the harmonic crystal with random conductances*. 15th German Probability and Statistics Days, Mannheim, Online, prerecorded short talk.
- Apr 2021 *Random interacements, the Gaussian free field and percolation*. PhD Students and Postdocs Probability Seminar, New York University, Online.
- Feb 2021 *Disconnection and entropic repulsion for the harmonic crystal with random conductances*. Percolation Today Seminar, ETH Zürich, Université de Genève, University of Cambridge, Online.
- Mar 2020 *Disconnection and entropic repulsion in two strongly correlated percolation models*. 14th German Probability and Statistics Days, Dresden, *Cancelled due to COVID-19 pandemic*.
- Sep 2019 *Disconnection in two percolation models with strong correlations*. Probability and Mathematical Physics Seminar, New York University.
- June 2019 *Disconnection in two percolation models with strong correlations*. Rencontre ANR/SNSF MALIN, Les Diablerets.
- May 2019 *Disconnection by Gaussian Free Field level sets and entropic repulsion*. Oberseminar Wahrscheinlichkeitstheorie, TU Munich.
- Dec 2018 *Disconnection by level sets of the discrete Gaussian free field and entropic repulsion*. Oberseminar Stochastik, University of Cologne.

## Teaching and Advising

### Teaching

- Fall term Lecture
  - 2024 on *Advanced Probability Theory I*, MATH 5411 (HKUST).
- Summer term Seminar / Independent Study
  - 2024 on *Percolation Theory*, MATH 4985O (HKUST).
- Spring term Lecture
  - 2024 on *Advanced Mathematical Statistics II*, MATH 5432 (HKUST).
- Fall term Lecture
  - 2023 on *Topics in Probability and Statistics: Random Walks on Graphs and Applications*, MATH 6450K (HKUST).
- Spring term Lecture
  - 2023 on *Mathematical Statistics*, MATH-GA.2962 (NYU Courant).

- Fall term Lecture  
2022 on *Complex Variables I*, MATH-GA.2450 (NYU Courant).
- Spring term Lecture  
2022 on *Mathematical Statistics*, MATH-UA.234 (NYU Courant).
- Fall term Lecture  
2021 on *Theory of Probability*, MATH-UA.233 (NYU Courant).
- Spring term Lecture  
2021 on *Probability and Statistics*, MATH-UA.235 (NYU Courant).
- Fall term Lecture  
2020 on *Complex Variables I*, MATH-GA.2450 (NYU Courant).
- Spring term Tutorial  
2020 for *Brownian Motion and Stochastic Calculus* with Prof. Dr. W. Werner (ETH Zurich).
- Fall term Teaching assistance  
2019 for *Mathematics III* with Prof. Dr. E. W. Farkas (ETH Zurich).
- Spring term Tutorial  
2019 for *Applied Stochastic Processes* with Prof. Dr. V. Tassion (ETH Zurich).
- Fall term Teaching assistance  
2018 for *Mathematics III* with Prof. Dr. N. Hungerbühler and Dr. A. Caspar (ETH Zurich).
- Fall term Tutorial and teaching assistance  
2017 for *Mathematics III* with Prof. Dr. E. W. Farkas (ETH Zurich).
- Spring term Tutorial  
2017 for *Applied Stochastic Processes* with Prof. Dr. A.-S. Sznitman (ETH Zurich).
- Summer term Tutorial and teaching assistance  
2016 for *Probability Theory II* with Prof. Dr. J. Johannes (Univ. Heidelberg).
- Winter term Tutorial  
2015/16 for *Theoretical Statistical Physics* with Prof. Dr. U. Schwarz (Univ. Heidelberg).
- Winter term Tutorial  
2015/16 for *Partial Differential Equations* with Prof. Dr. H. Knüpfer (Univ. Heidelberg).
- Summer term Tutorial  
2015 for *Probability Theory I* with PD. Dr. J. Tadjuidje-Kamgaing (Univ. Heidelberg).
- Winter term Tutorial  
2014/15 for *Introduction to Probability Theory and Statistics* with PD. Dr. K. Oelschläger (Univ. Heidelberg).
- Winter term Tutorial  
2013/14 for *Linear Algebra I* with Prof. Dr. H. Matzat. (Univ. Heidelberg)

### **Advising**

- 2024 – Advisor of a PhD project of *Zhizhou Liu* (Hong Kong University of Science and Technology)
- 2023 Advisor of a semester project (SCIE 3500 IRE) of *Xiaochen Wang* (Hong Kong University of Science and Technology), Title: *Local limits of random walks on a torus and random interlacements*

- 2023 Co-advisor of a master thesis of *Mathew Calkins* (New York University), jointly with Prof. Dr. A. Donev, Title: *Monte Carlo Simulations and Level Set Percolation in the Gaussian Free Field with Random Conductances*
- 2022 Co-advisor of a master thesis of *Di Wu* (New York University), jointly with Prof. Dr. S. Armstrong, Title: *On Entropic Repulsion for Random Interface Models*
- 2021 Co-advisor of a semester project of *Jiaming Chen* (ETH Zurich), jointly with Prof. Dr. V. Tassion, Title: *Decoupling Inequality and non-trivial phase transition for the level set percolation of the Gaussian Free Field*

## Languages

German native  
English fluent  
Latin 'Latinum'