

Alexander Zass

PLACE AND DATE OF BIRTH Venice, Italy | 24 August 1993
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Current position

Since July 2021 | **Post-doctoral researcher** at the Weierstrass Institute
for Applied Analysis and Probability, Berlin
Funded by the SPP 2265: Random Geometric Systems
Project 04: *The statistical mechanics of the interlacement point process*

Scientific education

2017 – 2021 | **PhD student** at the University of Potsdam (Summa cum Laude)
Thesis: *A multifaceted study of marked Gibbs point processes*
Supervisors: Prof. Sylvie Røelly and Prof. Gilles Blanchard
Funded by SFB 1294: Data Assimilation

2015 – 2017 | **Master's in Mathematics** at the University of Padova (110/110 cum Laude)
Thesis: *Collective motion of living organisms: the Vicsek model*
Supervisor: Prof. Paolo Dai Pra
Courses followed included: Stochastic Calculus and its applications to Finance,
Markov Chains, Branching Processes, Queueing Theory; Numerical Analysis;
Dynamical systems; Differential Geometry

2017 | Erasmus fellowship at the University of Lille

2012 – 2015 | **Bachelor's in Mathematics** at the University of Padova (109/110)
Thesis: *Nonsmooth Analysis and the Maximal Principle in Control Theory*
Supervisor: Prof. Carlo Mariconda

2013 | Tuition remission for merit

2012 | Excellency scholarship from INDAM (National Institute for High Mathematics)

Scientific interests

Probability theory, Gibbs point processes, statistical mechanics, stochastic geometry, large deviations, phase transitions, interacting particle systems

Scientific work

PREPRINTS

- [7] W. König, Q. Vogel, **A. Z.**, *Proof of off-diagonal long-range order for the free Bose gas with Feynman–Kac formula*, arXiv: arXiv:2312.07481, submitted (2023)
- [6] B. Jahnel, C. Külske, **A. Z.**, *Locality properties for discrete and continuum Widom–Rowlinson models in random environments*, arXiv:2311.07146, submitted (2023)

ARTICLES IN JOURNALS AND PROCEEDINGS

- [5] M. Fradon, J. Kern, S. Røelly, **A. Z.**, *Diffusion dynamics for an infinite system of two-type spheres and the associated depletion effect*, Stoch. Proc. Appl. 171, 104319 (2024)
- [4] **A. Z.**, *Gibbs point processes on path space: Existence, cluster expansion and uniqueness*, Markov Process. Rel. Fields 28, 329–364 (2022)
- [3] P. Houdebert, **A. Z.**, *An explicit continuum Dobrushin uniqueness criterion for Gibbs point processes with non-negative pair potentials*, J. Appl. Probab. 59.2, 541–555 (2022)
- [2] **A. Z.**, *A Gibbs point process of diffusions: Existence and uniqueness*, In Proceedings of the XI international conference Stochastic and Analytic Methods in Mathematical Physics, Lectures in Pure and Applied Mathematics

6, 13–22, Potsdam University Press (2020)

- [1] S. Røelly, A. Z., *Marked Gibbs point processes with unbounded interaction: An existence result*, J. Stat. Phys. 179, 972–996 (2020)

Seminars and talks

Rome, June 2024	<i>A model for colloids: Diffusion dynamics for two-type hard spheres and the associated depletion effect</i> Conference “Fourth Italian Meeting on Probability and Mathematical Statistics” (invited in contributed session)
Paris, May 2024	<i>Discrete and continuous Widom–Rowlinson models in random environment</i> Workshop “A lifelong journey in stochastic analysis: from branching processes to statistical mechanics” (invited)
Braunschweig, January 2024	<i>A model for colloids: Diffusion dynamics for two-type hard spheres and the associated depletion effect</i> Colloquium of the Institute for Mathematical Stochastics (invited)
Düsseldorf, February 2023	<i>Diffusion dynamics for an infinite system of two-type spheres and the associated depletion effect</i> Workshop “Mathematics and microscopic theory for random soft matter systems” (mini talk)
Prague, October 2022	<i>Interacting diffusions as marked Gibbs point processes</i> Stochastic Geometry seminar (invited)
Berlin, June 2022	<i>Interacting diffusions as marked Gibbs point processes</i> Workshop “Random Point Processes in Statistical Physics” (invited)
Bologna, June 2022	<i>Existence of infinite-volume marked Gibbs point processes: a path space example</i> Conference “Third Italian Meeting on Probability and Mathematical Statistics” (invited in contributed session)
Potsdam, May 2022	<i>Bose-Einstein condensation: introduction and open problems</i> Research Seminar in Probability (invited)
Berlin, April 2022	<i>Crash course on marked Gibbs point processes</i> First annual conference of the SPP2265
Karlsruhe, February 2022	<i>Marked Gibbs point processes: a path space example</i> Workshop “New trends in point process theory” (invited)
Magdeburg, January 2022	<i>Gibbs point processes on path space: existence, cluster expansion and uniqueness</i> Oberseminar zur Stochastik (invited)
Karlsruhe, December 2021	<i>Gibbs point processes on path space: existence, cluster expansion and uniqueness</i> Stochastic Geometry seminar (invited)
Cologne, November 2021	<i>A marked Gibbs point process on path space: existence and uniqueness</i> Oberseminar Stochastik (invited)
Yerevan, September 2019	<i>Existence of Gibbsian point measures via entropy methods</i> Conference “Stochastic and analytic methods in mathematical physics” (invited)
Potsdam, April 2019	<i>The use of the entropy method for Gibbs point processes</i> Workshop “Singular diffusions: Analytic and stochastic approaches I”
Toulouse, March 2019	<i>Entropy method for Gibbs point processes</i> Workshop “Stochastic processes and statistical machine learning II”
Bogotá, December 2018	<i>Two characterisations of infinite-volume Gibbs measures</i> Workshop “Random and spectral analysis with application in statistical physics” (invited)
Potsdam, February 2018	<i>Collective motion of living organisms: the Vicsek model</i> Workshop “Stochastic processes and statistical machine learning I”
Bogotá, December 2017	<i>Random patterns in the natural sciences: the Boolean model</i> Workshop “Random models with applications in the natural sciences” (invited)

Research visits

Munich, November 8–11, 2022	at TU Munich, invited by Dr Quirin Vogel
Prague, October 11-12, 2022	at the Charles University, invited by Prof. Victor Benes
Bonn, August 1–3, 2022	at HIM Junior Trimester Program “Stochastic modelling in the life sciences”
Magdeburg, January 20-21, 2022	at the Otto von Guericke University of Magdeburg, invited by Dr Moritz Otto
Karlsruhe, December 9-10, 2021	at the KIT, invited by Prof. Günter Last
Cologne, November 1–5, 2021	at the University of Cologne, invited by Prof. Alexander Drewitz
Lille, March 8–11, 2020	at the University of Lille, invited by Prof. David Dereudre
Paris, May 20-21, 2018	at the Institut des Hautes Études Scientifiques (IHES), invited by Prof. Gilles Blanchard
Kyiv, September 21–26, 2018	at the Institute of Mathematics at the National Academy of Sciences of Ukraine, invited by Prof. Alexandra Antoniouk
Lille, June 19-20, 2018	at the University of Lille, invited by Prof. David Dereudre

Supervision activity

- 2020, **Master’s** thesis of P. Tschisgale, *Introduction to the Glauber Dynamics for the Curie-Weiss Potts Model*
- 2018, **Bachelor’s** thesis of P. Tschisgale, *An introduction to the Potts model*, winner of the 2019 Berliner Mathematische Gesellschaft (BMG) best Bachelor Thesis award
- 2018, **Bachelor’s** thesis of C. Hansch, *Some findings on the Ising model*
- 2018, **High school** pupil projects at the Berlin Französische Gymnasium as part of the popularisation project *Math en Jeans*

Teaching experience

Summer 2024	Mathematics student seminar on <i>Gibbs measures in statistical physics</i>
Autumn 2020	Exercise classes to the <i>Advanced Probability theory</i> Master’s course
Autumn 2018	Lecture and exercise class on the <i>Poisson point process</i> , Ringvorlesung of the Data Science Master’s
Summer 2018	Exercise classes to the <i>Stochastic Analysis</i> Master’s course

Organisational activity

- Rome, 10–14.06.2024: Contributed session “Interacting systems in statistical mechanics” at 4th Italian Meeting on Probability and Mathematical Statistics
- Since September 2021: Organiser of the Interacting Random Systems group seminar
- Co-organisation of the following conferences, summerschools, and workshops:

Berlin, 28–30.10.2024	Conference “Third annual conference of the SPP 2265” Funded by SPP 2265
Berlin, 3–5.07.2024	Workshop “Junior Female Researchers in Probability”
Berlin, 17–21.07.2023	Summer school “Probability and geometry on configuration spaces” Funded by SPP 2265

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| Berlin, 11–14.04.2022 | Conference
“First annual conference of the SPP 2265”
Funded by SPP 2265 |
| Potsdam, 1–3.04.2019 | Workshop
“Singular diffusions: Analytic and stochastic approaches I”
Funded by the Alexander von Humboldt Foundation |
| Toulouse, 13–15.03.2019 | Workshop
“Stochastic processes and statistical machine learning II”
Funded by the Deutsch-Französische Hochschule |
| Potsdam, 14–16.02.2018 | Workshop
“Stochastic processes and statistical machine learning I”
Funded by the Deutsch-Französische Hochschule |
- 2019 – 2021: PhD representative of the DFG Collaborative Research Centre 1294
 - Co-organiser of the 2018 Math en Jeans congress (Potsdam, 13–16.03.2018)

Computer skills

Languages & Software: C, C++, HTML, Mathematica, MatLab, Python

Good command of: Office Suite, Photoshop, Windows OS, Unix (Ubuntu, MacOS)

Language skills

Italian native speaker

English excellent (Cambridge Certificate of Proficiency in English - CPE)

French B2

German B1

Community service

2013 – 2017: Volunteer work at G6PD Deficiency Association (www.g6pd.org).

The appointment required moderating the mailing lists and forums (English and Italian). I also helped migrate to a new CMS in 2014.

Other experience

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| 2015 – 2023 | Admin of the Padova University Mathematics Student Facebook page
“Matematica UniPD” (1300+ members) |
| 2009 – 2014 | Intern at web application provider Oracle of Endor
www.endormedia.com
- application testing and translation (English to and from Italian) |