

Lea Boßmann

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Academic positions

- from 2/2024 **Johannes Gutenberg-Universität Mainz**
Junior professor for Analysis (W1 with tenure track to W2)
- 10/2022–1/2024 **Ludwig-Maximilians-Universität München**
Postdoctoral fellow with Prof. Dr. Phan Thành Nam
- 11/2019–9/2022 **Institute of Science and Technology Austria**
Postdoctoral fellow with Prof. Dr. Robert Seiringer
Parental leave: 3/2021–10/2021

Education

- 10/2016–10/2019 **PhD (Mathematics)**, Eberhard Karls Universität Tübingen
Advisor: Prof. Dr. Stefan Teufel
Dissertation: *Effective dynamics of interacting bosons: Quasi-low-dimensional gases and higher order corrections to the mean-field description*
Grade: summa cum laude
- 04/2014–08/2016 **Master of Science (Theoretical and Mathematical Physics)**,
Ludwig-Maximilians-Universität München and Technische Universität München
Thesis: *On the Dipole Approximation* (Advisor: Prof. Dr. Detlef Dürr)
Grade: 1.0
- 09/2013–03/2014 **Study abroad**, The Queen's University of Belfast
- 10/2010–07/2013 **Bachelor of Science (Physics)**, Ludwig-Maximilians-Universität München
Thesis: *Study on the distinction of down and strange quark jets originating from the top quark decay* (Advisor: Prof. Dr. Otmar Biebel)
Grade: 1.0
- 06/2010 **Abitur**, Gymnasium Starnberg
Grade: 1.0

Honors

- **Invited speaker at the International Congress on Mathematical Physics 2021**
Thematic session *Many-body Quantum Systems and Condensed Matter Physics*
- **Dissertation Prize 2020**
Awarded by the Faculty of Science of the University of Tübingen

Publications and preprints

- [13] *Ground state of Bose gases interacting through singular potentials*
L. Boßmann, N. Leopold, S. Petrat, S. Rademacher
Preprint, arXiv:2309.12233, 2023.
- [12] *A note on the binding energy for bosons in the mean-field limit*
L. Boßmann, N. Leopold, D. Mitrouskas, S. Petrat
Preprint, arXiv:2307.13115, 2023.
- [11] *Focusing dynamics of 2D Bose gases in the instability regime*
L. Boßmann, C. Dietze, P.T. Nam
Preprint, arXiv:2307.00956, 2023.
- [10] *Asymptotic analysis of the weakly interacting Bose gas: A collection of recent results and applications*
L. Boßmann, N. Leopold, D. Mitrouskas, and S. Petrat
To appear in *Physics and the Nature of Reality: Essays in Memory of Detlef Dürr*, Springer, 2023.
- [9] *Edgeworth expansion for the weakly interacting Bose gas*
L. Boßmann, S. Petrat
Lett. Math. Phys. 113(4), 2023.
- [8] *Low-energy spectrum and dynamics of the weakly interacting Bose gas*
L. Boßmann
J. Math. Phys. 63, 061102, 2022.
Special issue: XX International Congress on Mathematical Physics
- [7] *Beyond Bogoliubov dynamics*
L. Boßmann, S. Petrat, P. Pickl and A. Soffer
Pure Appl. Anal. 3(4):677–726, 2021.
- [6] *Asymptotic expansion of low-energy excitations for weakly interacting bosons*
L. Boßmann, S. Petrat and R. Seiringer
Forum Math. Sigma 9:e28, 2021.
- [5] *Derivation of the 2d Gross–Pitaevskii equation for strongly confined 3d bosons*
L. Boßmann
Arch. Ration. Mech. Anal. 238(2):541–606, 2020.
- [4] *Higher order corrections to the mean-field description of the dynamics of interacting bosons*
L. Boßmann, N. Pavlović, P. Pickl and A. Soffer
J. Stat. Phys. 178(6):1362–1396, 2020.
- [3] *Derivation of the 1d Gross–Pitaevskii equation from the 3d quantum many-body dynamics of strongly confined bosons*
L. Boßmann and S. Teufel
Ann. Henri Poincaré 20(3):1003–1049, 2019.
- [2] *Derivation of the 1d nonlinear Schrödinger equation from the 3d quantum many-body dynamics of strongly confined bosons*
L. Boßmann
J. Math. Phys. 60, 031902, 2019.
Editor's Pick 2019 in Condensed Matter Physics.
- [1] *On the dipole approximation with error estimates*
L. Boßmann, R. Grummt and M. Kolb
Lett. Math. Phys. 108(1):185–193, 2018.

Grants and Fellowships

10/2022–9/2023	MCQST Distinguished Postdoc Funded by the German Research Foundation (DFG) within the cluster of excellence <i>Munich Center of Quantum Science and Technology</i> under Germany's Excellence Strategy (EXC2111).
11/2019–6/2022	ISTplus postdoctoral fellowship Funded by IST Austria and the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 754411
6/2022	Research in Pairs, Mathematisches Forschungsinstitut Oberwolfach Research fellowship with Dr. Nikolai Leopold (Universität Basel), Prof. Dr. Sören Petrat (Jacobs University Bremen), and Dr. Simone Rademacher (IST Austria)
10/2010–4/2016	Max Weber Program of the State of Bavaria Scholarship within the Elite Network of Bavaria

Selected talks

Invited conference talks (Selection)

- *Spectral Analysis of Schrödinger Operators*, ICERM, Brown University, Providence, 8/2024
- *DMV Annual Meeting*, Ilmenau, 9/2023
- *Beyond IID in Information Theory*, Tübingen, 8/2023
- *Correlations in Mathematical Quantum Mechanics*, University of Copenhagen, 6/2023
- *Many-body quantum problems and dispersive PDEs*, University of Warwick, 6/2023
- *Solid Math – Mathematical and numerical results for Solid State Physics*, SISSA, Trieste, 9/2022
- *Laws of Nature conference remembering Detlef Dürr*, LMU, Munich, 8/2022
- *AMS-SMF-EMS joint international meeting*, Université de Grenoble-Alpes, Grenoble, 7/2022
- *International Congress on Mathematical Physics (ICMP)*, Geneva, 8/2021
- *Minisymposium Nonlinear Dynamics in Quantum Mechanics*, online, 10/2020
- *AMS Fall Southeastern Sectional Meeting*, University of Florida, Gainesville, 11/2019
- Oberwolfach meeting *Many-Body Quantum Systems*, MFO, Oberwolfach, 9/2019
- *Workshop on Analysis, PDE and Mathematical Physics*, CCNU, Wuhan, 7/2019
- *On mathematical aspects of interacting systems in low dimension*, FernUniversität in Hagen, 6/2019

Invited seminar talks (Selection)

- Oberseminar *Mathematical Physics*, Universität Tübingen, 12/2022
- *One World IAMP Mathematical Physics Seminar*, online, 11/2021
- *Séminaire Maths-Physique*, Institut de Mathématiques de Toulouse, 2/2021
- *Seminar Analysis and Mathematical Physics*, Universität Basel, 12/2020
- *Analysis seminar*, University of Texas at Austin, 11/2019
- *Mathematical Physics seminar*, Rutgers University, New Jersey, 10/2019
- *Mathematical and Theoretical Physics seminar*, Jacobs University, Bremen, 9/2019
- *Zürich–Tübingen meeting in mathematical physics*, Universität Zürich, 11/2018
- *Mathematical Research Seminar*, Duke Kunshan University, 10/2018

Selected research visits

- **Central China Normal University**, Wuhan, China (24.7.–2.8.2019)
Invited by Prof. Dr. Avy Soffer and Prof. Dr. Xiaohua Yao
- **Duke Kunshan University**, Kunshan, China (26.8.–20.10.2018)
Invited by Prof. Dr. Peter Pickl
- **Gran Sasso Science Institute**, L’Aquila, Italy (16.–21.4.2018)
Invited by Dr. Serena Cenatiempo

Teaching experience

Lecturer

WiSe 23/24 *Mathematics I for Natural Scientists*, LMU Munich

Teaching assistant

WiSe 20/21 *Mathematics of quantum many-body systems II*, IST Austria
SoSe 20 *Mathematics of quantum many-body systems I*, IST Austria
WiSe 18/19 *Mathematical foundations I*, Duke Kunshan University
SoSe 18 Seminar *Funktionentheorie*, Universität Tübingen
WiSe 15/16 *Quantenmechanik*, LMU
WiSe 14/15 *Quantenmechanik*, LMU
SoSe 14 *Theoretische Mechanik*, LMU
SoSe 13 *Mathematik für Physiker II*, LMU
WiSe 12/13 *Mathematik für Physiker I*, LMU

Student supervision

2023 Nathan Wayne Ariston (MCQST Summer Bachelor student, Yale University)

Further education

2023 *Diversity in Leadership*
One-semester program on diversity and inclusion in the academic context, MCQST
2017 *Teaching Mathematics*
Two-day seminar on university didactics in Mathematics, Universität Tübingen
2013 *Mit Stimme und Körpersprache zum Erfolg*
Multi-day seminar on voice and body language for teaching, Elite Network of Bavaria

Academic services

- Committee member *Association of Women in Mathematical physics* (3/2023–present) and *Austrian Association of Women in Mathematics* (11/2021–10/2022)
- Co-organizer of the LMU–TUM Junior Researcher Seminar, 2022–23
- Co-organizer of the conference *Second Austrian Day of Women in Mathematics*, 2/2022
- Referee for *Communications in Partial Differential Equations; Mathematical Physics, Analysis and Geometry; Discrete and Continuous Dynamical Systems; Annales Henri Poincaré*.