

WOJCIECH DYBALSKI

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EDUCATION

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|-----------------|--|
| 11/2004–03/2009 | PhD in Theoretical Physics, University of Göttingen. Advisor: D. Buchholz. |
| 09/2003–10/2004 | Graduate studies, University of Ottawa / NRC Ottawa. Advisor: P. Hawrylak. |
| 10/1998–06/2003 | MSc in Mathematical Physics, University of Warsaw. Advisor: J. Dereziński. |

PROFESSIONAL EXPERIENCE

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|-----------------|---|
| 10/2017–present | Technical University of Munich , Mathematics Department.
Group Leader within the Emmy Noether Programme
of the German Research Foundation (DFG). |
| 04/2017–09/2017 | Ludwig-Maximilian University of Munich , Mathematics Department.
Substitute Associate Professor. |
| 03/2014–03/2017 | Technical University of Munich , Mathematics Department.
Group Leader within the Emmy Noether Programme
of the German Research Foundation. |
| 04/2013–02/2014 | ETH Zürich , Theoretical Physics Department.
Postdoctoral Fellow; Advisor: G.M. Graf. |
| 12/2012–03/2013 | University of Paris-Sud , Mathematics Department.
Fellow of the DFG; Advisor: C. Gérard. |
| 09/2012–12/2012 | Hausdorff Research Institute for Mathematics, Bonn .
Group Leader, Junior Trimester Program ‘Mathematical Physics’. |
| 03/2012–08/2012 | University of Paris-Sud , Mathematics Department.
Fellow of the DFG; Advisor: C. Gérard. |
| 09/2011–02/2012 | University of Aarhus , Mathematics Department.
Postdoctoral Fellow; Advisor: J.S. Møller. |
| 04/2009–08/2011 | Technical University of Munich , Mathematics Department.
Postdoctoral Fellow; Advisor: H. Spohn. |

GRANTS AND AWARDS

- 12/2017 | **AHP Prize** for the most remarkable article in Annales Henri Poincaré in 2016: *Lieb-Robinson bounds, Arveson spectrum and Haag-Ruelle scattering theory in gapped quantum spin systems* jointly with S. Bachmann and P. Naaijken.
- Citation:** The article constructs rigorously the scattering theory for gapped quantum spin models, showing that in such systems one may speak about "quasiparticles" which behave very similarly to usual particles satisfying the bosonic statistics. By extending the Haag-Ruelle theory for relativistic QFT to interacting homogeneous non-relativistic systems, the authors solve an important open problem in mathematical physics. The main difficulty, consisting of the absence of Einstein's causality, is overcome by using the Lieb-Robinson bound on the propagation speed and conditions on the shape of the one-particle spectrum. The general construction, done using elegant and natural arguments, is illustrated on the example of the Ising model in transverse magnetic field. The techniques developed in the paper open new exciting perspectives in the study of nonequilibrium states of strongly coupled spin systems.
- 03/2014–08/2019 | **Emmy Noether Grant of the DFG (1.000.000 EUR)**
Host institution: Technical University of Munich.
- 03/2012–03/2014 | Research Fellowship of the DFG
University of Paris-Sud / ETH Zürich.
- 09/2012–12/2012 | Fellowship of the Hausdorff Research Institute for Mathematics
Received jointly with K. Rejzner, J. Schlemmer and Y. Tanimoto.
- 05/2018–06/2018 | Travel grant of the Center for French-Bavarian University Collaboration (BFHZ)
Received jointly with M. Wrochna

CONFERENCE ORGANIZATION

- 03/2017 | Workshop: 'Macroscopic Limits of Quantum Systems',
Technical University of Munich / LMU. **Main organizer.**
- 05/2016 | 38th LQP Workshop: 'Foundations and Constructive Aspects of QFT',
Institute for Advanced Study, Technical University of Munich. **Main organizer.**
- 10/2015 | 'Quantum Field Theory: Infrared and Constructive Aspects',
Mathematics Department, Technical University of Munich. **Main organizer.**
- 09/2012 | 'Algebraic Quantum Field Theory and Local Symmetries',
Hausdorff Research Institute for Mathematics, Bonn. **Main organizer.**

INVITED CONFERENCE TALKS (selection)

- 08/2018 **W. Dybalski.** *Infrared problems in QED: Some topics of current research.* ‘Physics and Mathematics of QFT’, BIRS Banff, Canada.
- 07/2018 S. Bachmann, **W. Dybalski**, P. Naaijkens. *Lieb-Robinson bounds, Arveson spectrum and Haag-Ruelle scattering theory in gapped quantum spin systems.* ‘International Congress of Mathematical Physics’, Montreal. AHP Prize session.
- 07/2017 **W. Dybalski.** *From infrared problems to non-commutative recurrence.* ‘Mini-workshop Mathematical Physics’, LMU Munich.
- 05/2017 **W. Dybalski.** *Non-relativistic QED in different gauges.* ‘Foundational and Structural Aspects of Gauge Theories’, MITP Mainz.
- 05/2017 **W. Dybalski.** *From LSZ ideas to non-commutative recurrence.* ‘Wolfhart Zimmermann Memorial Symposium’, MPI Munich.
- 12/2016 **W. Dybalski.** *Non-relativistic QED in different gauges.* ‘Infrared Problems in QED and Quantum Gravity’, Perimeter Institute, Waterloo, Canada.
- 11/2016 **W. Dybalski.** *Mathematical foundations of Quantum Field Theory.* ‘Autumn School on Mathematical Foundations of Physics’, LMU Munich.
- 07/2016 **W. Dybalski** and C. Gérard. *Asymptotic observables and the problem of asymptotic completeness in QFT.* Workshop ‘Recent Mathematical Developments in Quantum Field Theory’, Mathematical Research Institute of Oberwolfach.
- 02/2016 **W. Dybalski** and C. Gérard. *A criterion for asymptotic completeness in local relativistic QFT.* Spring Meeting of the German Physical Society, University of Hamburg.
- 07/2015 S. Alazzawi and **W. Dybalski.** *Compton scattering in the Buchholz-Roberts framework of relativistic QED.* Conference ‘Operator Algebras and Quantum Physics’, University of Sao Paulo, Brazil.
- 09/2014 **W. Dybalski** and A. Pizzo. *Towards a consistent description of Coulomb scattering in QFT.* Conference ‘Mathematical Physics in Jena’, University of Jena.
- 03/2014 **W. Dybalski** and A. Pizzo. *Coulomb scattering in QFT. A status report.* Workshop ‘Many body quantum systems’, University of Warwick.
- 11/2013 **W. Dybalski** and A. Pizzo. *Towards a consistent description of Coulomb scattering in QFT.* Workshop ‘Mathematical Physics’, ETH Zürich.
- 04/2013 **W. Dybalski** and C. Gérard. *Towards asymptotic completeness in local relativistic QFT.* Conference ‘Variational and spectral methods in QFT’, Henri Poincaré Institute, Paris.
- 09/2012 **W. Dybalski** and C. Gérard. *Towards asymptotic completeness in massive relativistic QFT.* Conference ‘Modern trends in algebraic QFT’, National Institute for Nuclear Physics, Frascati.
- 09/2011 **W. Dybalski.** *Inclusive cross-sections in relativistic and non-relativistic QED.* Workshop ‘Rigorous quantum field theory in the LHC era’, Erwin Schrödinger Institute, Vienna.

TEACHING

	Technical University of Munich.
10/2018–02/2019	Lecturer: ‘Quantum Field Theory’, Physics Master Course, 4 hours/week. <ul style="list-style-type: none"> • Taught jointly with Prof. A. Weiler. • My part is 14 hours/semester on mathematical foundations. • Core module of Elite Master Course ‘Theoretical and Mathematical Physics’.
10/2017–02/2018	Lecturer: ‘Quantum Field Theory’, Physics Master Course, 4 hours/week. <ul style="list-style-type: none"> • Taught jointly with Prof. M. Beneke. • My part is 14 hours/semester on mathematical foundations. • Core module of Elite Master Course ‘Theoretical and Mathematical Physics’.
04/2016–07/2016	Lecturer: ‘Non-relativistic QED’, specialised course, 2 hours/week.
10/2014–02/2015	Lecturer: ‘Algebraic Quantum Field Theory’, specialized course, 4 hours/week.
	Ludwig-Maximilian University of Munich¹.
04/2017–07/2017	Lecturer: ‘Mathematics II for Physicists’, basic course, 4 hours/week.
04/2017–07/2017	Lecturer: ‘Algebraic Quantum Field Theory’, specialized course, 4 hours/week.
	University of Göttingen.
10/2007–02/2008	Head Teaching Assistant: ‘Statistical Mechanics and Thermodynamics’.
04/2007–07/2007	Teaching Assistant: ‘Quantum Mechanics I’.
10/2006–02/2007	Teaching Assistant: ‘Classical Mechanics’.
04/2006–07/2006	Teaching Assistant: ‘Quantum Mechanics I’.
	University of Ottawa.
09/2003–04/2004	Teaching Assistant: ‘First Physics Lab’.
	University of Warsaw.
02/2002–06/2002	Teaching Assistant: ‘Theory of Linear Operators’.

SUPERVISION

2 Postdocs, 1 PhD Student, 6 MSc Students, 2 BSc Students.

PROFESSIONAL TEACHING QUALIFICATION

09/2015 | Participation in workshop ‘**Hochschuldidaktik: kompetenzorientierte Lehre entwickeln und gestalten**’ of DFG and Zentrum für Wissenschaftsmanagement.

REFeree AND EDITORIAL SERVICES

German Research Foundation (Proposal review).

Commun. Math. Phys., J. Math. Phys., Lett. Math. Phys., Ann. Henri Poincaré Phys. Rev. Lett., Phys. Rev. A. (Article review).

Proceedings volume ‘Macroscopic Limits of Quantum Systems’ within the PROMS series of Springer (Editor).

LANGUAGES

English, German, Polish.

REFERENCES

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Prof. Christian Gérard
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