

UNIVERSITÀ DEGLI STUDI DI MILANO

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Niels Patriz Benedikter

CURRICULUM VITAE

INFORMAZIONI PERSONALI

Cognome: Benedikter
Nome: Niels Patriz
Data di Nascita: 7.4.1986
Cittadinanza: tedesca
Lingue: tedesco (madrelingua), inglese (ottimo), italiano (buono)

RESEARCH SUMMARY

My research is centered on the derivation of effective theories for interacting quantum many-body systems. I have worked on the quantitative derivation of effective evolution equations for bosons (Gross–Pitaevskii equation) and fermions (Hartree–Fock equation). I have also studied the derivation of the Hartree–Fock–Bogoliubov (or BCS) equations through the time-dependent variational principle, and their well-posedness. Furthermore I have worked on interaction corrections to spin-wave theory for the quantum Heisenberg model. Recently I focused on corrections to Hartree–Fock theory due to many-body correlations, giving a rigorous justification of the random phase approximation. The main focus of my research is now to extend our understanding of the random phase approximation from various points of view, including spectral theory and dynamics.

BIBLIOGRAPHIC INDICATORS

Citations 94 (Scopus)
h-index 5 (Scopus)

PROFESSIONAL EXPERIENCE

- since 11/2017 Postdoc at Institute of Science and Technology Austria (IST Austria) with Prof. Robert Seiringer
(in the research project funded by ERC Advanced Grant 694227)
- 01/2015–10/2017 Postdoc at the Department of Mathematical Sciences, University of Copenhagen, with Prof. Jan Philip Solovej
(in the research project funded by ERC Advanced Grant 321029 and in the research project funded by Villum Fonden via the QMATH Centre of Excellence, grant 10059)
- 10/2014–12/2014 Postdoc at the Department of Mathematics and Physics, Università Roma Tre, with Prof. Alessandro Giuliani
(in the research project funded by ERC Starting Grant 239694)
- 04/2014–09/2014 Postdoc at the Institute of Mathematics, University of Zurich, with Prof. Benjamin Schlein

EDUCATION AND DEGREES

- 30.04.2014 Dr. rer. nat. (Dottore di Ricerca) from University of Bonn (grade 0.7, magna cum laude)
- 04/2011–04/2014 Graduate studies at the Bonn International Graduate School in Mathematics at the Hausdorff Center for Mathematics, University of Bonn
PhD thesis: “Effective Evolution Equations from Many-Body Quantum Mechanics”
Advisor: Prof. Benjamin Schlein
- 15.12.2010 Diplom (Laurea Magistrale) in Physics, University of Stuttgart (grade 1.0, very good)
Diploma thesis: “Dynamics of the Radiative Decay of Excited Atoms in Quantum Electrodynamics ”
Advisors: Prof. Marcel Griesemer, Prof. Jürg Fröhlich (ETH Zurich)
- 10/2007 Vordiplom (“pre-laurea”) in Physics (grade 1.0, very good)
- 09/2007 Vordiplom (“pre-laurea”) in Mathematics (grade 1.0, very good)
- 10/2005–03/2011 Studies of Physics and Mathematics at the University of Stuttgart
- 2005 Abitur (Maturità Scientifica) (grade 1.0, very good)

INVITED TALKS AT INTERNATIONAL CONFERENCES

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| 09/2019 | “Dynamics, Equations and Applications” (DEA 2019), session on mathematical physics, Kraków |
| 04/2019 | (declined invitation) “Walkshop Mathematical Physics” at Karlsruhe Institute of Technology |
| 03/2019 | “Many-Body Theory, Effective Equations and PDEs”, Mittag-Leffler Institute, The Royal Swedish Academy of Sciences, Stockholm |
| 08/2016 | “Methods of Modern Mathematical Physics: A Young Researcher Symposium on the Occasion of the 70th Birthday of Barry Simon”, Fields Institute, Toronto |

CONTRIBUTED TALKS AT INTERNATIONAL CONFERENCES

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| 07/2018 | “XIX International Congress on Mathematical Physics” (ICMP 2018), Montréal |
| 04/2017 | “Spectral Days 2017”, Stuttgart |
| 02/2016 | “Mathematical Challenges in Quantum Mechanics”, Bressanone |
| 09/2013 | “QMath12 - Mathematical Results in Quantum Physics”, Berlin |

INVITED SEMINARS

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| 03/2019 | Seminar at the Gran Sasso Science Institute, L'Aquila |
| 11/2018 | COND-MATH Seminar at Università Roma Tre |
| 11/2018 | Quantum Lunch at University of Copenhagen |
| 03/2018 | Formal Sciences Seminar at IST Austria |
| 12/2017 | Mathematical Physics Seminar at LMU Munich |
| 02/2017 | Quantum Lunch at University of Copenhagen |
| 12/2016 | Seminar Analysis, Math-Phys and Quantum at SISSA Trieste |
| 10/2016 | Formal Sciences Seminar at IST Austria |
| 09/2015 | COND-MATH Seminar at Università Roma Tre |
| 04/2015 | Mathematical Physics Seminar at Università Insubria, Como |
| 02/2015 | Quantum Lunch at University of Copenhagen |
| 10/2014 | COND-MATH Seminar at Università Roma Tre |

02/2014	Seminar at University of Mannheim
01/2014	Quantum Lunch at University of Copenhagen
12/2013	Seminar at University of Bonn
12/2013	Mathematical Physics Seminar at University of Bristol
12/2013	Warwick Statistical Mechanics Seminar at University of Warwick
11/2013	Oberseminar Analysis at University of Stuttgart
10/2010	Mathematical Physics Seminar at University of Heidelberg

RESEARCH STAYS AND WORKSHOPS BY INVITATION

09/2019 (1 week)	Mathematisches Forschungsinstitut Oberwolfach <i>Many-Body Quantum Systems</i>
03/2019 (3 weeks)	The Royal Swedish Academy of Sciences, Institut Mittag-Leffler <i>Spectral Methods in Mathematical Physics</i>
12/2017 (1 week)	Research Stay at LMU Munich, invited by Prof. Phan Thành Nam
09/2016 (1 week)	Mathematisches Forschungsinstitut Oberwolfach <i>Many-Body Quantum Systems and Effective Theories</i>

TEACHING EXPERIENCE

Winter 2018	Teaching assistant for the graduate course “Stability of Matter in Quantum Mechanics”, IST Austria
Summer 2017	Lecturer of the master course “Advanced Mathematical Physics” (Lectures, seminars and exercise sessions on Spectral Theory and Mathematical Quantum Mechanics), University of Copenhagen very good course evaluations
Summer 2016	Lecturer of the master course “Advanced Mathematical Physics” (Lectures, seminars and exercise sessions on Spectral Theory and Mathematical Quantum Mechanics), University of Copenhagen very good course evaluations
Summer 2014	Tutorial sessions at the summer school “Mathematical Physics, Analysis and Stochastics”, University of Heidelberg
Summer 2013	Teaching assistant for Analysis 2, University of Bonn
Winter 2012	Teaching assistant for Analysis 1, University of Bonn

Winter 2012	Teaching assistant for Precourse Mathematics (for first-year students of Mathematics Bachelor), University of Bonn
Winter 2011	Teaching assistant for Functional Analysis and Partial Differential Equations, University of Bonn

CONFERENCES ATTENDED (SELECTED LIST)

11/2018	“Gran Sasso Quantum Meetings: from many particle systems to quantum fluids”, GSSI, L’Aquila
03/2017	“Macroscopic Limits of Quantum Systems (70th birthday of Herbert Spohn)”, Munich
08/2016	“Frontiers in Mathematical Physics”, Montréal
05/2016	“Solid Math 2016”, Aalborg
07/2015	“Trails in Quantum Mechanics and Surroundings 2015”, Como
05/2015	“Symposium: 50 years of mathematics at the FIM”, ETH Zurich
09/2014	“Scaling limits and effective theories in classical and quantum mechanics”, Erwin Schrödinger Institute, Vienna
06/2013	“Mathematical Properties of Large Quantum Systems”, part of the IHP Trimester “Variational and Spectral Methods in Quantum Mechanics”
08/2012	“XVII International Congress on Mathematical Physics” (ICMP 2012), Aalborg
08/2011	“Quantissima in the Serenissima: Mathematical challenges in quantum many-body physics”, Venice
09/2010	“Quantum Field Theory and Gravity: Conceptual and mathematical advances in the search for a unified framework”, Regensburg

SUMMER- AND WINTERSCHOOLS ATTENDED (SELECTED LIST)

07/2018	“Summer School on Current Topics in Mathematical Physics”, Fields Institute, Toronto
06/2018	EMS–IAMP Summer School in Mathematical Physics: “Universality in Probability Theory and Statistical Mechanics”, Ischia
07/2016	EMS–IAMP Summer School in Mathematical Physics: “Universality, Scaling Limits and Effective Theories”, Rome

05/2015	“Master Class on Quantum Mechanics“, University of Copenhagen
03/2014	Winterschool of the Graduiertenkolleg 1838 Stuttgart/Tübingen, Blaubeuren
09/2013	Summerschool at CIRM Luminy, part of the IHP Trimester “Variational and Spectral Methods in Quantum Mechanics“, Marseille

THIRD-PARTY FUNDING

03/2019	Postdoctoral Fellowship, Institut Mittag-Leffler, The Royal Swedish Academy of Sciences, 2 k€
10/2017	Career Grant from the program “Finding Talents“, FFG Austria, covering relocation costs to Austria, 2 k€
2011–2014	PhD Scholarship of the Studienstiftung des Deutschen Volkes, support for participation in workshops/summer schools
2011–2014	Hausdorff PhD Scholarship at the Bonn International Graduate School of Mathematics, 53 k€
2005–2011	Scholarship of the Studienstiftung des Deutschen Volkes, 6 k€

PRIZES

2007–2011	Exemption from tuition fees at the University of Stuttgart due to exceptional talents or excellent course results
2005	Abitur award of the Deutsche Physikalische Gesellschaft (German Physical Association)

INVENTIONS AND PATENTS

2006-2009	Utility model DE202005013431U1, <i>Arrangement for monitoring of area located underneath plaster of paris, comprising sensors measuring various parameters</i> , with Nikolas Dimitriadis and Marcel Düring
2006-2009	Utility model DE202005013432U1, <i>Device for supplying gas underneath a plaster cast or splint, used to reduce temperature and humidity of the skin, optionally also to supply active agents</i> , with Nikolas Dimitriadis and Marcel Düring

ORGANIZATION OF CONFERENCES

5/2017	Øresundsseminar in Lund (jointly organized by the University of Copenhagen and University of Lund)
12/2016	Øresundsseminar in Copenhagen (jointly organized by the University of Copenhagen and University of Lund)
5/2016	Øresundsseminar in Lund (jointly organized by the University of Copenhagen and University of Lund)
11/2015	Øresundsseminar in Copenhagen (jointly organized by the University of Copenhagen and University of Lund)

REFEREE FOR SCIENTIFIC JOURNALS

Communications in Mathematical Physics
Journal of Functional Analysis
Annales Henri Poincaré
Letters in Mathematical Physics
Reviews in Mathematical Physics
Mathematical Physics, Analysis and Geometry
Journal of Physics A: Mathematical and Theoretical
Journal of Physics: Condensed Matter
several conference proceedings

COOPERATION PARTNERS

Current	Chiara Boccato (IST Austria), Andreas Deuchert (IST Austria), Phan Thành Nam (LMU Munich), Marcello Porta (University of Tübingen), Benjamin Schlein (University of Zurich), Robert Seiringer (IST Austria)
Previous	Dorothea Golze (Aalto University Helsinki), Jürg Hutter (University of Zurich), Marcella Iannuzzi (University of Zurich), Vojkan Jakšić (McGill University Montreal), Chiara Saffirio (University of Zurich), Jérémy Sok (University of Basel), Jan Philip Solovej (University of Copenhagen), Gustavo de Oliveira (Universidade Federal de Minas Gerais), Jan Wilhelm (University of Zurich)

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

International Association of Mathematical Physics

German Physical Association (DPG)

REFERENCES

Prof. Robert Seiringer IST Austria, robert.seiringer@ist.ac.at

Prof. Jan Philip Solovej University of Copenhagen, solovej@math.ku.dk

Prof. Benjamin Schlein University of Zurich, benjamin.schlein@math.uzh.ch

Data: February 22, 2019

Luogo: Klosterneuburg