

UNIVERSITÀ DEGLI STUDI DI MILANO

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Chiara Boccato

CURRICULUM VITAE

Informazioni Personali

Cognome: Boccato
Nome: Chiara
Data di Nascita: 20/04/1986
Cittadinanza: italiana
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Research Summary

My research is centered on the mathematical investigation of interacting quantum many-body systems.

In particular, I have been studying the derivation of effective equations for the dynamics of Bose-Einstein condensates and the spectral properties of the Bose gas in the Gross-Pitaevskii regime.

Recently I have been working on the thermodynamic limit of the Bose gas, on bosonic systems at positive temperature and on two-dimensional systems.

Bibliographic Indicators

Citations 71 (Scopus)
h-index 5 (Scopus)

Professional Experience

since 11/2017 Postdoc at Institute of Science and Technology Austria (IST Austria), Klosterneuburg (Vienna), with Prof. Robert Seiringer (in the research project funded by ERC Advanced Grant 694227)

Education and Degrees

30/08/2017 *Dr. sc. nat. (Dottore di Ricerca)*, University of Zurich
Thesis title: “Dynamical and spectral properties of Bose gases with singular interactions”
Advisor: Prof. Benjamin Schlein

04/2013-09/2017 Graduate studies
Topic: Mathematical aspects of many-body quantum mechanics
University of Zurich (02/2014-09/2017), Advisor: Prof. Benjamin Schlein
Hausdorff Center for Mathematics, University of Bonn (04/2013-01/2014), Advisor: Prof. Benjamin Schlein

27/11/2012 *M.Sc. Degree in Physics (Laurea Magistrale in Fisica)*, University of Milano-Bicocca
Specialization: Theoretical Physics
Grade: 110/110 cum laude
Thesis title: “Hartree dynamics as the limit of the evolution of a quantum many-body system”
Advisors: Prof. Riccardo Adami, Prof. Alessandro Tomasiello

10/2009-11/2012 Master studies in Theoretical Physics at the University of Milano-Bicocca

24/04/2009 *B.Sc. Degree in Physics (Laurea in Fisica)*, University of Milano-Bicocca
Specialization: Theoretical Physics
Grade: 109/110
Thesis title: “Solitons and instantons in scalar field theories”
Advisor: Prof. Silvia Penati

10/2005-04/2009 Bachelor studies in Physics at the University of Milano-Bicocca

2005 *Secondary Education Certificate with scientific orientation (“Maturità scientifica”)*, Liceo scientifico statale “A. Volta”, Milan
Grade: 91/100

Publications

1. *The excitation spectrum of the Bose gas in the Gross–Pitaevskii regime.*
Reviews in Mathematical Physics **32**, 2060006 (2020).
doi:10.1142/S0129055X20600065
2. *The excitation spectrum of the Bose gas in the Gross–Pitaevskii regime.*
Contribution to the Oberwolfach report “Many–Body Quantum Systems”,
Report No. 41/2019.
https://www.mfo.de/occasion/1937/www_view
doi:10.4171/OWR/2019/41 (to be activated)
3. (with C. Brennecke, S. Cenatiempo, B. Schlein) *Optimal rate for Bose–Einstein condensation in the Gross–Pitaevskii regime.*
Communications in Mathematical Physics **376**, 1311–1395 (2020).
doi:10.1007/s00220-019-03555-9
4. (with C. Brennecke, S. Cenatiempo, B. Schlein) *Bogoliubov Theory in the Gross–Pitaevskii Limit.*
Acta Mathematica **222**, no. 2, 219–335 (2019).
doi:10.4310/ACTA.2019.v222.n2.a1
5. *Dynamical and spectral properties of Bose gases with singular interactions.*
Dissertation, Universität Zürich (2017)
https://www.recherche-portal.ch/primo-explore/fulldisplay?docid=ebi01_prod011160724&context=L&vid=ZAD&search_scope=default_scope&tab=default_tab&lang=de_DE
6. (with C. Brennecke, S. Cenatiempo, B. Schlein) *The excitation spectrum of Bose gases interacting through singular potentials.*
Journal of the European Mathematical Society **22**, no. 7, 2331–2403 (2020).
doi:10.4171/JEMS/966
7. (with C. Brennecke, S. Cenatiempo, B. Schlein) *Complete Bose–Einstein condensation in the Gross–Pitaevskii regime.*
Communications in Mathematical Physics **359**, 975–1026 (2018).
doi:10.1007/s00220-017-3016-5
8. (with S. Cenatiempo, B. Schlein) *Quantum Many–Body Fluctuations Around Nonlinear Schrödinger Dynamics.*
Annales Henri Poincaré **18**, 113–191 (2017).
doi:10.1007/s00023-016-0513-6

Invited Talks at International Conferences

25-29/01/2021	Minisymposium “Trends in nonlinear PDEs and applications” at “Biannual Congress of the Italian Society of Applied and Industrial Mathematics” (SIMAI), Università degli Studi di Parma
09/09/2019	“Many-Body Quantum Systems”, Mathematisches Forschungsinstitut Oberwolfach
15/08/2019	“QMath 14: Mathematical Results in Quantum Physics”, Aarhus University
19/03/2019	“Many-Body Theory, Effective Equations and PDEs”, Mittag-Leffler Institute, The Royal Swedish Academy of Sci- ences, Stockholm
27/09/2018	“Trails in Quantum Mechanics and Surroundings 2018”, Politecnico di Torino
29/11/2016	“Workshop in Mathematical Physics”, ETH Zurich

Invited Talks in Seminars

12/11/2019	Mathematical Physics seminar, Università di Roma Tre
06/03/2019	GSSI PDEs group seminar, Gran Sasso Science Institute, L’Aquila
23/11/2017	Physical Sciences Seminar, IST Austria, Klosterneuburg (Vi- enna)
16/08/2017	Quantum Lunch, University of Copenhagen
23/01/2017	Analysis Seminar, Politecnico di Torino
16/03/2016	Quantum Lunch, University of Copenhagen

Contributed Talks at International Conferences

27/07/2018	“XIX International Congress on Mathematical Physics” (ICMP 2018), Montréal
11/02/2016	“Mathematical Challenges in Quantum Mechanics”, Bressanone

Poster Sessions, Outreach Activities

30/11/2018	Introductory talk for undergraduate students at the “Student Open Day”, IST Austria
02/06/2016	Poster presentation at SwissMAP meeting, ETH Zurich
04-05/07/2013	Bonn International Graduate Schools (BIGS) Poster Exhi- bition, University of Bonn

Teaching Experience

Teaching assistant at the Department of Mathematics, University of Zurich

- Lecturing weekly exercise classes
- Preparation of weekly homeworks
- Correction of the students' homeworks

for the following courses:

Spring 2017	Stochastik für die Naturwissenschaften (Stochastics for the Natural Sciences), Dr. Christoph Luchsinger
Fall 2016	Lineare Algebra für die Naturwissenschaften (Linear Algebra for the Natural Sciences), Prof. Viktor Schroeder
Spring 2016	Analysis II, Prof. Benjamin Schlein
Fall 2015	Analysis I, Prof. Benjamin Schlein
Spring 2015	Mathematik für die Chemie II (Mathematics for Chemistry II), Prof. Thomas Kappeler
Fall 2014	Analysis III, Prof. Benjamin Schlein
Spring 2014	Analysis II, Prof. Camillo De Lellis

Workshops Participation 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>
09/2016 (1 week)	Mathematisches Forschungsinstitut Oberwolfach <i>"Many-Body Quantum Systems and Effective Theories"</i>

Formative activity: Conferences attended

17-20/12/2019	"From semi-classical to quantum many-body through normal forms", Università degli Studi di Milano
12-16/08/2019	"QMath 14: Mathematical Results in Quantum Physics" Aarhus University
27-29/09/2018	"Trails in Quantum Mechanics and Surroundings 2018" Politecnico di Torino
23-28/07/2018	"XIX International Congress on Mathematical Physics" (ICMP 2018) Montréal
20-21/07/2018	"Young Researchers Symposium of the ICMP 2018" McGill University, Montréal.

19-24/02/2018	“Mathematical Challenges in Quantum Mechanics” “Sapienza” Università di Roma.
28-30/11/2016	“Workshop in Mathematical Physics” ETH Zurich
8-13/02/2016	“Mathematical Challenges in Quantum Mechanics” Bressanone
22-26/09/2014	“Scaling limits and effective theories in classical and quantum mechanics” Erwin Schrödinger Institute, Vienna.
01-05/09/2014	“Selected Problems in Mathematical Physics” Polo Universitario La Spezia
18-20/09/2013	“Dipersive PDEs: Models and Dynamics.” Dipartimento di Matematica, Pisa.
17-21/06/2013	“Mathematical Properties of Large Quantum Systems”, part of the Trimester “Variational and Spectral Methods in Quantum Mechanics” Institut Henri Poincare, Paris
27-31/05/2013	“Workshop on Analytical Aspects of Mathematical Physics” ETH Zurich
29-02/02/2013	“Trails in Quantum Mechanics and Surroundings” INFN Frascati National Laboratories

Formative activity: Summer- and Winterschools attended

16-19/07/2018	“Current Topics in Mathematical Physics”, Fields Institute, Toronto http://www.fields.utoronto.ca/activities/18-19/physics-summer-school
17-21/07/2017	“Current Topics in Mathematical Physics”, University of Zurich https://www.math.uzh.ch/index.php?konferenzdetails0&key1=491
08-13/02/2016	“Mathematical Challenges in Quantum Mechanics”, Bressanone https://www.mcqm.cond-math.it/
10-14/02/2014	“BCS Theory and NLS Equations”, Graduiertenkolleg 1838 “Spectral Theory and Dynamics of Quantum Systems”, Blaubeuren http://pnp.mathematik.uni-stuttgart.de/iadm/grk1838/Workshops/workshop2014/Workshop_2014..html
01-07/09/2013	“Current Topics in Mathematical Physics ”, Centre international de rencontres mathématiques (CIRM), Marseille https://www.cirm-math.fr/Archives/?EX=info_rencontre&annee=2013&id_renc=904

Third-Party Funding/Prizes

- 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€

Participation in International Research Groups

- since 11/2017 participation in the research project of Prof. Robert Seiringer
funded by ERC Advanced Grant 694227.
<https://www2.ist.ac.at/research-groups-pages/seiringer-group/erc-grant/>
- 04/2017-09/2017 Participation in the research project of Prof. Benjamin Schlein
“Dynamical and energetic properties of Bose-Einstein condensates” funded by the Swiss National Science Foundation.
<http://p3.snf.ch/Project-172623>
- 04/2014-03/2017 Participation in the research project of Prof. Benjamin Schlein
“Effective equations from quantum dynamics” funded by the Swiss National Science Foundation.
<http://p3.snf.ch/Project-153621>

Referee for Scientific Journals

Journal of Mathematical Physics
Journal of Statistical Physics

Cooperation Partners

Niels Benedikter (Università degli studi di Milano), Christian Brennecke (Harvard University), Serena Cenatiempo (GSSI), Andreas Deuchert (University of Zurich), Alessandro Olgiati (CNRS Grenoble), Benjamin Schlein (University of Zurich), Robert Seiringer (IST Austria)

Membership in Professional Organizations

GNFM (Gruppo Nazionale di Fisica Matematica)

Languages

Italian (native speaker), English (fluent), German (good)

References

Prof. Riccardo Adami Politecnico di Torino, riccardo.adami@polito.it

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

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

Data: 12/07/2020

Luogo: Klosterneuburg