

Théotime Girardot

PostDoc in Mathematical Physics

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Research: I focus on condensed matter related problem from a mathematical physics perspective. More precisely, I try to understand the ground state properties (condensation, superfluidity, decoherence) of anyons gases, deeply related to the FQHE, in many different regimes.

Professional Background

- 2024–2026 **PostDoc position**, *Gran Sasso Science Institute*, L'Aquila, Italy, Group of S. Cenatiempo
Conferences, talks and publications, see lists below.
- 2021–2023 **Teaching at Aarhus University**, *responsible of maths exercise sessions for first and second year students in maths for the course of analysis, 3h a week for two semesters*, Denmark
- 2021–2023 **PostDoc position**, *Aarhus University*, Denmark, Supervised by Søren Fournais
Conferences, talks and publications, see lists below.
- 2018–2021 **Teaching at UGA**, *responsible for two semesters, 6h a week, of maths exercise sessions and exams writing/corrections for first and second year students in physics for the courses of analysis, linear and bilinear algebra*, Grenoble, France
- 2019–2021 **PhD in mathematical Physics**, *supervised by Nicolas Rougerie*, LPMMC, Grenoble, France
Conferences, talks and publications, see lists below.
- 2017 **Exp. internship in fluid mechanics**, *directed by P. Marmottant*, LyPhy, Grenoble, France
Implementation of an experimental setting, measures and data processing (Python).

Education

- 2019–2021 **PhD in mathematical physics**, *supervised by Nicolas Rougerie*, LPMMC, Grenoble, France
- 2015–2018 **University Grenoble Alpes**, (*UGA*), Grenoble, France, Master : Matière Quantique
obtained with honors
- 2013–2014 **First year of Engineer school**, *INP Pagora*, Grenoble, France
- 2010–2013 **Scientific preparatory class PTSI**, *Lycée Duhoda*, Nîmes, France
- 2009–2010 **Bachelor's degree**, *Lycée Jean-Baptiste Dumas*, Alès, France, Options SI and Maths

Langages

English Fluent, can teach in English
Italian B1

Coding: Phyton, L^AT_EX, C++ and Visual Basic

Reviewing activities

- Reviewer for :
- ARMA Archive for Rational Mechanics and Analysis
 - SIAM Journal on Mathematical Analysis (SIMA)

Conferences

- Scaling limit in Kinetic theory, ENS, Lyon (2019)
- From Quantum to Classical, CIRM, Marseille (2019)
- ICMP, Geneva (2021)
- INdAM Quantum Meetings in Milan (2022)
- The analysis of relativistic quantum systems, CIRM, Marseille (2023)

- Quantum hub, Copenhagen (2023)
- Correlations in Mathematical Quantum Mechanics, Copenhagen (2023)
- Hausdorff School, Recent Advances in Quantum and Statistical Mechanics, Bonn, Germany (2023)
- Winter School on Mathematical Physics, Kochel am See, Germany (2024)
- Mathematical challenges in quantum mechanics, GSSI L'Aquila, (2025)
- Walkshop 2025 in Bremen, constructor university (2025)
- Conference Mittag-Leffler, Anyons from Small to Large Scales (2025)

Talks, seminars and visits

- Physics seminar of LPMMC (R. Anna Minguzzi): Average field approximation for almost bosonic anyons in a magnetic field (2020)
- Physics seminar of LPMMC (R. Anna Minguzzi): Experimental evidences of fractional statistics (2021)
- Mathematical physics seminar of the universities of Warsaw (Pr. Marcin Napiórkowski): Topological origin of anyons and almost-bosonic limit (2021)
- Bazel (Pr. Chiara Saffirio) : Semiclassical limit for almost fermionic anyons (2021)
- Vienna (Pr. Robert Seiringer) : Semiclassical limit for almost fermionic anyons (2021)
- LMU, Munich at the Calculus of Variations and Applications seminar (Pr. Phan Thành Nam and D. Arnaud Triay) : A lieb–thirring inequality for extended anyons (2022)
- Institut Mathématique de Bordeaux, PDE seminar (APr. Jean Baptiste Burie) : Introduction to the concept of anyonic particles (2023)
- Quantum lunch Copenhagen (Pr. Soeren Fournais) : A lieb–thirring inequality for extended anyons (2023)
- SMAQ seminar GSSI (Pr. Serena Cenatiempo) : Introduction to the concept of anyonic particles (2024)
- PDE seminar Uppsala university (Pr. Douglas Lundholm): The thermodynamic limit of the free energy of dilute Bose gases at low temperatures interacting via strong potentials (2024)
- Quantum lunch (Pr. Soeren Fournais): Superfluidity of the dilute Bose gas at low temperature (2024)
- PDE seminar of the university of Dijon (Pr. Taro Kimura): Mathematical developments around the almost-bosonic-extended-anyons gas (2025)
- Walkshop 2025 in Bremen (Pr Sören Petrat): Derivation of the Chern-Simons-Schrödinger equation from the dynamics of an almost-bosonic-anyon gas (2025)
- Conference Mittag-Leffler, Anyons from Small to Large Scales : Derivation of the stationary Chern-Simons-Schrödinger equation for almost-bosonic anyons (2025)

Thesis

1. T. Girardot, Mean-field approximation for the anyon gas, PhD thesis, Université Grenoble Alpes et CNRS, l'École Doctorale Mathématiques, Sciences et technologies de l'information, Informatique, 2021.

Publications

1. T. Girardot,
Average field approximation for almost bosonic anyons in a magnetic field,
J.Math. Phys., 61 (2020), pp. 071901, 23.
(21) citations, Google Scholar.
2. T. Girardot and N. Rougerie,
Semiclassical limit for almost fermionic anyons,
Communications in Mathematical Physics, 387 (2021), pp. 427–480.
(7) citations, Google Scholar.
3. T. Girardot and N. Rougerie,
A Lieb–Thirring inequality for extended anyons,
Letters in Mathematical Physics, 113 (2023), p. 6
(2) citations, Google Scholar.
4. S. Fournais, T. Girardot, L. Junge, L. Morin, and M. Olivieri,
The ground state energy of a two-dimensional bose gas,
Communications in Mathematical Physics, 405 (2024), p. 59.
(21) citations, Google Scholar.

5. S. Fournais, T. Girardot, L. Junge, L. Morin, and M. Olivieri,
Lower bounds on the energy of the bose gas,
Reviews in Mathematical Physics, 36 (2024), p. 2360004.
(3) citations, Google Scholar.

Preprints

1. S. Fournais, L. Junge, T. Girardot, L. Morin, M. Olivieri, and A. Triay,
The free energy of dilute bose gases at low temperatures interacting via strong potentials,
arXiv:2408.14222, (2024).
(2) citations, Google Scholar.
2. T. Girardot and J. Lee,
Derivation of the Chern-Simons-Schrödinger equation from the dynamics of an almost-bosonic-anyon gas.
arXiv:2412.13080, (2024).
(1) citations, Google Scholar.
3. A. Ataei, T. Girardot and D. Lundholm
Microscopic derivation of the stationary Chern-Simons-Schrödinger equation for almost-bosonic anyons.
arXiv:2504.17488, (2025).
(0) citations, Google Scholar.
4. T. Girardot
Derivation of the Hartree dynamics for a N-particles fermionic 2D system interacting via long-range electric and magnetic two-body singular potentials in a dilute regime.
arXiv:2507.16300, (2025).
(0) citations, Google Scholar.