

CURRICULUM VITAE - GIACOMO GUARNIERI



1. Personal information

Surname	Guarnieri
Name	Giacomo
Nationality	Italian
Date of birth	08/02/1988
Professional title	Ph.D. In Physics, Astrophysics and Applied Physics
Email	giacomo.guarnieri@unipv.it , gguarnieri88@gmail.com
Professional address	Department of Physics University of Pavia, Via Bassi 6, Pavia, ITALY

2. Research professional experiences

Year	Role/Position	Organization or institution
01/11/2023 - Present	Tenure Track Assistant Professor (RTdB)	Università di Pavia
01/03/2022 - 31/10/2023	Marie Skłodowska-Curie Individual Fellowship	Freie Universität Berlin
01/11/2020 - 28/02/2022	Postdoc Researcher	Freie Universität Berlin
01/07/2018 - 31/10/2020	Postdoc Fellow	Trinity College Dublin
01/04/2017 - 30/06/2018	Postdoc Researcher	Palacky University Olomouc
01/01/2014 - 19/01/2017	PhD in Physics	Università degli Studi di Milano

3. Teaching and supervision professional experiences

I have always considered teaching to be an extremely rewarding and valuable experience that, moving from lesson preparation to student questions and comments, has the merit of leading to enrichment and deeper understanding of the subject matter. Based on my experiences both as a student and as a teacher/supervisor, I believe that the most effective method of teaching is the so-called "spiral approach," which involves returning to key concepts of the course with increasing detail as the course progresses. This, combined with a policy of encouraging students to ask questions during and outside of class, will be the cornerstone of my teaching philosophy.

All of the ex Art 45 Teaching Assistant contracts listed below consisted of 20 hours per semester

and included a predominant portion of exercise sessions, mixed with lectures (about 250 students in the classroom). In addition to these teaching hours, I set aside another ~40 hours per module for face-to-face meetings with students, both Bachelor's and Master's students, for tutoring and clarification of exercises and exam questions.

Year	Activity	Organization or Institution
2024	PhD course “Stochastic Thermodynamics in Open Quantum Systems” (30 hours)	Università di Pavia
2023	Series of lectures on invitation at Università degli Studi di Milano. Subject: Quantum Thermodynamics.	Università degli Studi di Milano
2022	Series of lectures on invitation at Università degli Studi di Milano. Subject: Quantum Thermodynamics.	Università degli Studi di Milano
2022	Ph.D. co-supervision. Name of the candidate: Dr. <i>Stefan Aimet</i> .	Freie Universität Berlin
2021	M. Sci. Master Thesis co-supervision. Name of the candidate: <i>Gabrielle Tournaire</i> .	Freie Universität Berlin
2020	M. Sci. Master Thesis co-supervision. Name of the candidate: <i>Jonathan Broome</i> .	Trinity College Dublin
2019	M. Sci. Master Thesis co-supervision. Name of the candidate: <i>Daniele Morrone</i> .	Trinity College Dublin
2016	Teaching Assistant (ex Art 45) for the course “Classical Electrodynamics and Special Relativity” (graduate course for Master students in Physics)	Università degli Studi di Milano
2016	Teaching Assistant (ex Art 45) for the course “General Physics” (undergraduate course for Bachelor students in Computer Science)	Università degli Studi di Milano
2015	Teaching Assistant (ex Art 45) for the course “Classical Electrodynamics and Special Relativity” (graduate course for Master students in Physics)	Università degli Studi di Milano
2015	Teaching Assistant (ex Art 45) for the course “General Physics” (undergraduate course for Bachelor students in Computer Science)	Università degli Studi di Milano
2014	Teaching Assistant (ex Art 45) for the course “Classical Electrodynamics and Special Relativity” (graduate course for Master students in Physics)	Università degli Studi di Milano

4. Education and Academic Qualifications

Year	Title or degree	Organization or Institution
------	-----------------	-----------------------------

10/2022	National Scientific Habilitation to Sector Phys. 02/B2 - II fascia (Assistant Professorship). Habilitation granted with unanimous vote. Committee: Prof. Lorenzo PAVESI, Prof. Enzo ORLANDINI, Prof. Stefano ATZENI, Prof.ssa Paola GALLO, Prof. Francesco TAFURI .	MUR
19/01/2017	Doctor Of Philosophy (Ph.D.) in Physics, Astrophysics and Applied Physics. <i>Grade:</i> Maximum with Honours. <i>Supervisor:</i> Prof. Bassano Vacchini. <i>Title of the Ph.D. Thesis:</i> Characterization of dynamical properties of non-Markovian open quantum systems. <i>Committee:</i> Prof. Alberto Barchielli, Prof. Rafael Omar Ferragut, Prof. Giuliano Benenti.	Università degli Studi di Milano
02/07/2014	Master degree in classical piano. <i>Grade:</i> 9.5/10. 10 years long course, done in parallel with the High School and University studies, ended during the first year of Ph.D.	Conservatorio di Musica G. Nicolini, Piacenza
03/10/2013	Master Degree in Physics <i>Grade:</i> 110 / 110 cum laude. <i>Supervisor:</i> Prof. Bassano Vacchini; <i>Co-supervisors:</i> Prof. Ludovico Lanz, Dr. Andrea Smirne. <i>Title of the Thesis:</i> Study of correlations in non-Markovian open quantum systems.	Università degli Studi di Milano
21/10/2010	Bachelor Degree in Physics <i>Grade:</i> 110 / 110 cum laude. <i>Supervisor:</i> Prof. Marco Potenza. <i>Title of the Thesis:</i> In line digital holography.	Università degli Studi di Milano
2007	Scientific High School Diploma, 100/100.	Liceo Scientifico Enrico Fermi, Fiorenzuola d'Arda (PC)

5. Full list of grants and fundings obtained in research activities

Year	Funding Body	Title of the Project	Name of the PI	Budget	Role in the Project
01/01/2024 - 01/01/2025	University Re-qualification Program "María Zambrano", funded by European Union NextGenerationEU and by Gobierno de España.	THESEUS - THERmodynamic s of prEciSion and information thEory in qUantum deviceS	G. Guarnieri	42 000 €	Awardee and Principal Investigator

01/03/2022 - 29/02/2024	European Union, EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions, H2020-MSCA-IF-2020	INTREPID - Information processing and the thermodynamics of precision in quantum devices	G. Guarnieri	162 806,40 €	Awardee and Principal Investigator
01/11/2020 - 28/02/2022	FQXI , Foundational Questions Institute	Fueling quantum field machines with information	J. Eisert, J. Schmiedmayer, M. Huber	1 345 591 \$	Postdoctoral Researcher hired to work on this project
01/07/2018 - 31/10/2020	European Union, ERC Starting Grant	ODYSSEY - Open dynamics of interacting and disordered quantum systems	J. Goold	1 333 325 €	Postdoctoral Research Fellow hired to work on this project
13/03/2017	European Union, COST Action MP1209	5 th Quantum Thermodynamics Conference, 8th Working Group Meetings	G. Guarnieri	700 €	Awardee of the COST Action for a STSM (Short Time Scientific Mission) to participate to the QTD Conference
29/09/16	European Union, COST Action MP1209	Landauer's principle in non-equilibrium open quantum systems	G. Guarnieri	700 €	Awardee of the COST Action for a STSM (Short Time Scientific Mission) to visit Prof. Campbell
01/01/2014 - 19/01/2017	Università degli Studi di Milano	PhD Scholarship	G. Guarnieri	51 000 €	Awardee of one PhD scholarship funded by the Italian Ministry of University and Research

6. Awards and prizes.

- **20/08/2020: Certificate of Editorial Excellence (Editors' Suggestion) from *Physical Review Letters***, for the paper "In situ thermometry of a cold Fermi gas via dephasing impurities".
- **29/09/2016: Certificate of Editorial Excellence from *Journal of Physics A: Mathematical and Theoretical***, for the paper "Single photon observables and preparation uncertainty relations" (*Journal of Physics A: Mathematical and Theoretical* 48 (26), 265302). This paper has furthermore been included in the IOP-SELECT section "Quantum mechanics and quantum information theory" and received a special column in *EuroPhysics News Journal* 46, Issue 5-6.

- **10/04/2017: Certificate and first prize for the best Poster** at the conference “Non-Markovianity and strong coupling effects in thermodynamics” in Bad Honnef (Germany). Amount: 75€. Source of Award: 640. WE-Heraeus Foundation.
- **2007-2009: Scholarship “Fondo per la mobilità e per il sostegno agli studenti”** awarded for three consecutive years during the Bachelor Degree in Physics. *Amount of the prize:*~1500 €. *Funded by:* Università degli Studi di Milano and Italian Ministry for Education and Research.

7. Main achievements of research activity

- Winner of Maria Zambrano Fellowship (42 000€), with the research project “THESEUS”
- Winner of Marie Skłodowska-Curie Individual Fellowship H2020-MSCA-IF-2020 (162 806.40 €), with the research project INTREPID, number 101026667 (<https://cordis.europa.eu/project/id/101026667>).
- Coauthor of 7 Physical Review Letters, including one Editor Suggestion (Physical Review Letters 125, 080402), 1 Nature Communications, 1 Nature NPJ Quantum Information and 1 Proceedings of the National Academy of Sciences (cover).
- Recipient of a Ph.D. scholarship, funded by the Italian Ministry of Education and Research (51000 €), won after two degrees in Physics obtained with 110/110 cum laude lode, and done in parallel to a Master Degree in classical Piano (10 years) at the Conservatory of Music G. Nicolini of Piacenza.

8. Research Activities

8.1. Summary

Number of publications	37 (of which 31 papers already published on international peer-reviewed journals — including 7 Physical Review Letters, 1 Nature Communications, 1 Nature NPJ Quantum Information and 1 PNAS— and 6 preprints currently under peer-review)
Number of citations	1521
H-index	21
I-10 index	26
Number of invited talks and seminars	25
Number of contributed talks	12
Number of poster presentations	11

Number of invited research visits	15
-----------------------------------	----

8.2. Keywords

- Quantum thermodynamics.
- Quantum information theory.
- Open quantum systems.
- Quantum coherence.
- Non-equilibrium processes.

8.3. List of publications

Here follows the list, in anti-chronological order, of the peer-reviewed articles already published and under current peer-review while available on arXiv. A URL link to the DOI is provided for each published paper.

1. *Typical thermalization of low-entanglement states*, C. Bertoni, C. Wassner, **G. Guarnieri**, J. Eisert, arXiv preprint arXiv:2403.18007, <https://arxiv.org/abs/2403.18007>
2. *Generalised linear response theory for the full quantum work statistics*, **G. Guarnieri**, J. Eisert, H. Miller, arXiv:2307.01885. <https://arxiv.org/abs/2307.01885>
3. *Experimental Observation of Curved Light-Cones in a Quantum Field Simulator*, M. Tajik, M. Gluza, N. Sebe, P. Schüttelkopf, F. Cataldini, J. Sabino, F. Møller, S. Ji, S. Erne, **G. Guarnieri**, S. Sotiriadis, J. Eisert, J. Schmiedmayer, Proceedings of the National Academy of Sciences, 120, 21. <https://doi.org/10.1073/pnas.2301287120>
4. *Hyperaccurate thermoelectric currents*, A. M. Timpanaro, **G. Guarnieri**, G. T. Landi, Physical Review B 107, 115432. <https://doi.org/10.1103/PhysRevB.107.115432>
5. *Particle current statistics in driven mesoscale conductors*, M. Brenes, **G. Guarnieri**, A. Purkayastha, J. Eisert, D. Segal, G. Landi, Physical Review B 108, L081119. <https://doi.org/10.1103/PhysRevB.108.L081119>
6. *The Thermodynamic Uncertainty Theorem*, K. J. Ray, A. B. Boyd, **G. Guarnieri**, J. P. Crutchfield, Phys. Review E **108**, 054126 <https://doi.org/10.1103/PhysRevE.108.054126>
7. *Time periodicity from randomness in quantum systems*, **G. Guarnieri**, M. T. Mitchison, A. Purkayastha, D. Jaksch, B. Buča, J. Goold, Physical Review A **106**, 022209. <https://doi.org/10.1103/PhysRevA.106.022209>.
8. *Periodically refreshed quantum thermal machines*, A. Purkayastha, **G. Guarnieri**, S. Campbell, J. Prior, J. Goold, Quantum 6, 801 <https://doi.org/10.22331/q-2022-09-08-801>.
9. *Probing coherent quantum thermodynamics using a trapped ion*, O Onishchenko, **G. Guarnieri**, P Rosillo-Rodes, D Pijn, J Hilder, UG Poschinger, M Perarnau-Llobet, J Eisert, F Schmidt-Kaler, **Paper accepted in Nature Communications**, arXiv:2207.14325. <https://arxiv.org/abs/2207.14325>
10. *Work extraction from coherently activated maps via quantum switch*, K. Simonov, G. Francica, **G. Guarnieri**, M. Paternostro, Physical Review A 105 (3), 032217 <https://doi.org/10.1103/PhysRevA.105.032217>

11. *Enhanced steady-state coherences via repeated system-bath interactions*, R. Román-Ancheyta, M. Kolář, **G. Guarnieri**, R. Filip, Physical Review A 104 (6), 062209 <https://doi.org/10.1103/PhysRevA.104.062209>
12. *Erratum: Steady-state coherences by composite system-bath interactions*, **G. Guarnieri**, M. Kolář, R. Filip, Physical Review Letters 127, 129901 <https://doi.org/10.1103/PhysRevLett.121.070401>
13. *Periodically refreshed baths to simulate open quantum many-body dynamics*, A. Purkayastha, **G. Guarnieri**, S. Campbell, J. Prior, J. Goold, Physical Review B 104, 045417 <https://doi.org/10.1103/PhysRevB.104.045417>
14. *The most precise quantum thermoelectric*, A. M. Timpanaro, **G. Guarnieri**, G. T. Landi, arxiv:2106.10205. <https://arxiv.org/abs/2106.10205>
15. *Joint statistics of work and entropy production along quantum trajectories*, H. J. D. Miller, M. H. Mohammady, M. Perarnau-Llobet, **G. Guarnieri**, Physical Review E 103, 052138 <https://doi.org/10.1103/PhysRevE.103.052138>
16. *Thermodynamic uncertainty relation in slowly driven quantum heat engines*, H. J. D. Miller, M. H. Mohammady, M. Perarnau-Llobet, **G. Guarnieri**, Physical Review Letters 126, 210603 <https://doi.org/10.1103/PhysRevLett.126.210603>
17. *Action quantum speed limits*, E. O' Connor, **G. Guarnieri**, S. Campbell, Physical Review A 103, 022210 <https://doi.org/10.1103/PhysRevA.103.022210>.
18. *Thermodynamics of precision in quantum nanomachines*, A. Rignon-Bret, **G. Guarnieri**, J. Goold, M. T. Mitchison, Physical Review E 103, 012133 <https://doi.org/10.1103/PhysRevE.103.012133>.
19. *Quantum work statistics with initial coherence*, M. G. Díaz, **G. Guarnieri**, M. Paternostro, Entropy 2020, 22(11), 1223 <https://doi.org/10.3390/e22111223>.
20. *Quantum Coherence and Ergotropy*, G. Francica, F. C. Binder, **G. Guarnieri**, M. T. Mitchison, J. Goold, F. Plastina, Physical Review Letters 125, 180603 <https://doi.org/10.1103/PhysRevLett.125.180603>
21. *Quantum fluctuations hinder finite-time information erasure near the Landauer limit*, H. J. D. Miller, **G. Guarnieri**, M. T. Mitchison, J. Goold, Physical Review Letters 125, 160602 <https://doi.org/10.1103/PhysRevLett.125.160602>.
22. *Non-equilibrium steady-states of memoryless quantum collision models*, **G. Guarnieri**, D. Morrone, B. Çakmak, F. Plastina, S. Campbell, Physics Letters A, 126576 <https://doi.org/10.1016/j.physleta.2020.126576>
23. *Quantum many-body attractor with strictly local dynamical symmetries*, B. Buca, A. Purkayastha, **G. Guarnieri**, M. T. Mitchison, D. Jaksch, J. Goold, arxiv:2008.11166. <https://arxiv.org/abs/2008.11166>
24. *In-Situ Thermometry of a Cold Fermi Gas via Dephasing Impurities*, M. T. Mitchison, T. Fogarty, **G. Guarnieri**, S. Campbell, T. Busch, J. Goold, Physical Review Letters 125 (8), 080402 (2020). <https://doi.org/10.1103/PhysRevLett.125.080402>
25. *Tunable phonon-induced steady-state coherence in a double-quantum-dot charge qubit*, A. Purkayastha, **G. Guarnieri**, M. T. Mitchison, R. Filip, J. Goold, Npj Quantum Information 6 (1), 1-7 <https://doi.org/10.1038/s41534-020-0256-6>.

26. *A quantum information theoretic quantity sensitive to the neutrino mass-hierarchy*, J. Naikoo, A. K. Alok, S. Banerjee, S. U. Sankar, **G. Guarnieri**, C. Schultze, B. C. Hiesmayr, Nuclear Physics B 951, 114872 <https://doi.org/10.1016/j.nuclphysb.2019.114872>
27. *Quantum work statistics and resource theories: bridging the gap through Rényi divergences*, **G. Guarnieri**, N. H. Y. Ng, K. Modi, J. Eisert, M. Paternostro, J. Goold, Physical Review E 99, 050101(R) <https://doi.org/10.1103/PhysRevE.99.050101>
28. *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*, A. Timpanaro, **G. Guarnieri**, J. Goold, G. T. Landi, Physical Review Letters 123, 090604 <https://doi.org/10.1103/PhysRevLett.123.090604>
29. *Unified treatment of the total angular momentum of single photons via generalized quantum observables*, M. Motta, **G. Guarnieri**, B. C. Hiesmayr, New Journal of Physics 21, 023017 <https://doi.org/10.1088/1367-2630/aaf841>
30. *Thermodynamics of precision in quantum non-equilibrium steady states*, **G. Guarnieri**, G. T. Landi, S. Clark, J. Goold, Physical Review Research, 1, 033021 <https://doi.org/10.1103/PhysRevResearch.1.033021>
31. *Steady-state coherences by composite system-bath interactions*, **G. Guarnieri**, M. Kolář, R. Filip, Phys. Rev. Letters 121, 070401 <https://doi.org/10.1103/PhysRevLett.121.070401>
32. *Full counting statistics approach to the quantum non-equilibrium Landauer bound*, **G. Guarnieri**, S. Campbell, S. Pigeon, J. Goold, M. Paternostro, B. Vacchini, New Journal of Physics 19, 103038 <https://doi.org/10.1088/1367-2630/aa8cf1>
33. *Non-equilibrium quantum bounds to Landauer's principle: Tightness and effectiveness*, S. Campbell, **G. Guarnieri**, M. Paternostro, B. Vacchini, Physical Review A 96, 042109 <https://doi.org/10.1103/PhysRevA.96.042109>
34. *Energy backflow in strongly coupled non-Markovian continuous-variables systems*, **G. Guarnieri**, J. Nokkala, R. Schmidt, S. Maniscalco, B. Vacchini, Physical Review A, 94, 062101 <https://doi.org/10.1103/PhysRevA.94.062101>
35. *Energy backflow and non-Markovian dynamics*, **G. Guarnieri**, C. Uchiyama, B. Vacchini, Phys. Rev. A 93, 012118 <https://doi.org/10.1103/PhysRevA.93.012118>
36. *Single-photon observables and preparation uncertainty relations*, **G. Guarnieri**, M. Motta, L. Lanz, Journal of Physics A: Mathematical and Theoretical 48 265302 <https://doi.org/10.1088/1751-8113/48/26/265302>
37. *Quantum regression theorem and non-Markovianity of quantum dynamics*, **G. Guarnieri**, A. Smirne, B. Vacchini, Physical Review A 90, 022110 <https://doi.org/10.1103/PhysRevA.90.022110>

8.4. Research Visits

- 01/2023: Research Visit, financed by INFN, to Prof. Francesco Plastina and his group at Università della Calabria (Italy).
- 11/2022: Research Visit, financed through Marie Skłodowska Curie travel budget, to Prof. Javier Prior and his group at l'Universidad de Murcia (Spain).
- 10/2022: Research Visit, financed through Marie Skłodowska Curie travel budget, to Prof. Dragi Karevski and the LPCT Laboratories of Nancy at l'Université de Lorraine (France).

- 04/2022: Research Visit, financed by University College Dublin, to Prof. Steve Campbell and Prof. Andrew Mitchell and their research groups.
- 01/2020: Research Visit, financed by INFN, to Prof. Francesco Plastina and his group at Università della Calabria (Italy).
- 11/2019: Research Visit to Prof. Andreas Winter and Dr. Philipp Strasberg at Università UAB di Barcellona (Spain).
- 03/2019: Research Visit, financed by Instituto de Fisica USP of Sao Paolo (Brazil), to Prof. Gabriel T. Landi and his group.
- 01/2019: Research Visit, financed by INFN, to Prof. Francesco Plastina and his group at Università della Calabria (Italy).
- 11/2018: Research Visit to Prof. Mile Gu and his research group at the Center for Quantum Technologies, Singapore.
- 05/ 2017: Research Visit to Prof. Beatrix Hiesmayr and her research group in Vienna (Austria).
- 02/2017: Research Visit, financed by “DST India-BMWfW Austria Project Based Personnel Exchange Programme”, to Prof. Subhashish Banerjee and his group at the Indian Institute of Technology Jodhpur (IITJ) (India).
- 28/09/2016 - 10/10/2016: Research Visit, financed as “Short-time scientific mission (STSM)” by the European Coordination in Science and Technology (ECOST), to Prof. Mauro Paternostro and his research group at Queen’s University of Belfast (Northern Ireland).
- 03/2016: Research Visit to Prof. Mauro Paternostro and his group at CTAMOP research center in Belfast (Northern Ireland).
- 02/2016: Research Visit to Prof. Sabrina Maniscalco and her research group at University of Turku (Finland).

8.5. Participation with talks and posters to conferences, seminars and workshops

8.5.1. Invited talks and seminars

- 27/11/2023 - 02/12/2023: *Quantum Signatures in close-to-equilibrium Stochastic Thermodynamics*. Invited talk at NONGAUSS Workshop 2023, Olomouc, Czech Republic.
- 13/11/2023 - 15/11/2023: *Quantum Signatures in close-to-equilibrium Stochastic Thermodynamics*. Invited talk at 5th Nottingham Workshop on Quantum Non-Equilibrium Dynamics, Nottingham, UK.
- 03/03/2023: *Towards a theoretical and computational characterization of the dynamics and thermodynamics of open quantum systems*. Invited talk at UC Davis seminar series, Davis, CA (USA).
- 01/03/2023: *Towards a theoretical and computational characterization of the dynamics and thermodynamics of open quantum systems*. Invited talk at IBM Almaden Laboratories seminar series Quantum PIC , San Jose, CA (USA).
- 02/02/2023 - 04/02/2023: *Thermodynamics of Precision in quantum thermal machines: from theory to experiment*. Invited speaker at the conference “Quantum Optics and Information Meeting” (KOBIT), Eskişehir (Turkey).

- 12/01/2023: *Quantum Thermodynamics of Precision: theory and experiment*. Presented at: Università della Calabria, Cosenza (Italy).
- 11/01/2023: *Landauer's erasure at the quantum level*. Presented at: Università della Calabria, Cosenza (Italy).
- 15/12/2022: *Quantum Thermodynamics of Precision: theory and experiment*. Presented at: Università degli Studi di Milano, Milano (Italy).
- 05/12/2022: *Thermodynamics of Precision in quantum thermal machines: theory and experiment*. Presented at: INRIM - Istituto Nazionale di Ricerca Metrologica, Torino (Italy).
- 18/10/2022: *Quantum Thermodynamics Uncertainty Relations: theory and experiment*. Presented at: Laboratory of Theoretical Physics and Chemistry of the Université de Lorraine, Nancy (France).
- 28/10/2022: *Advances in Thermodynamic Uncertainty Relations for quantum systems*. Presented at: Quantum Optics group University of Potsdam, Potsdam (Germany).
- 06/05/2022: *Advances in Thermodynamic Uncertainty Relations for quantum systems*. Presented at: Quantum Enabling System Technologies (QUEST), Koç University, Istanbul (Turkey).
- 23/03/2020 - 28/03/2020: *Thermodynamics of precision in quantum non-equilibrium steady states: a novel approach based on quantum information and geometry of quantum states*. Invited speaker at the workshop "The Order of Things 2020" (TOOT), Obergurgl (Austria) (workshop cancelled due to Covid-19).
- 24/02/2020 - 06/03/2020: *Thermodynamics of precision in quantum non-equilibrium steady states: a novel approach based on quantum information and geometry of quantum states*. Invited speaker at the workshop "School and Workshop on Quantum Information Theory and Thermodynamics at the Nanoscale", Al Hoceima (Morocco) (participation cancelled due to Covid-19).
- 08/07/2019 - 10/07/2019: *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*. Invited speaker at the workshop "Quantum Thermal Machines: Dynamical Models and Implementations at the Nanoscale", Erlangen (Germany).
- 11/2019: *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*. Presented at: Condensed Matter Theory Group Seminars series, University College Dublin, Dublin (Ireland).
- 11/2019: *Thermodynamics of precision in quantum non equilibrium steady states*. Presented at: Quantum Information Seminar Series, Universitat Autònoma de Barcelona, Barcelona (Spain).
- 02/2019: *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*. Presented at: University College Cork, Cork (Ireland).
- 02/2019: *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*. Presented at the Dublin Institute for Advanced Studies (DIAS), Dublin (Ireland).
- 11/2018: *Autonomous generation of steady-state coherences by system-bath interaction*. Presented at: Palacky University of Olomouc, Olomouc (Czech Republic).

- *10/2018: Autonomous generation of steady-state coherences by system-bath interaction.* Presented at: Centre for Quantum Technologies (CQT), Singapore.
- *04/2018: Autonomous generation of steady-state coherences by system-bath interaction.* Presented at: QuSys seminar series at Trinity College Dublin, Dublin (Ireland).
- *05/2017: Characterization of heat in non-Markovian open quantum systems.* Presented at: Vienna Theory Lunch Seminar, University of Vienna, Vienna (Austria).
- *03/2016: Energy backflow in non-Markovian open quantum systems.* Presented at: Queen's University of Belfast, Belfast (Northern Ireland).
- *02/2016: Energy backflow and non-Markovianity in open quantum systems.* Presented at: University of Turku, Turku (Finland).

8.5.2. Contributed talks

- *10/03/2023: Probing coherent quantum thermodynamics using a trapped ion.* Presented at: APS March Meetings 2023, Las Vegas (USA).
- *05/2022: Thermodynamics of precision in quantum non-equilibrium steady states.* Presented at: Quantum Information in Spain ICE-7, MICINN/AEI Spanish Research Network RITCE (RED2018-102707-E), University of Granada, Institute Carlos I for Theoretical and Computational Physics (IC1) and Ion Traps and Lasers Laboratory (Spain).
- *03/2022: Thermodynamic Uncertainty Relations in Slowly Driven Quantum Engines.* Presented at: APS March Meetings 2022.
- *07/2021: Quantum fluctuations hinder finite-time information erasure near the Landauer limit.* Presented at: Thermodynamics and Information in the Quantum Regime (TIQuR2021).
- *03/2021: Quantum fluctuations hinder finite-time information erasure near the Landauer limit.* Presented at: APS March Meetings 2021, online.
- *10/2020: Quantum fluctuations hinder finite-time information erasure near the Landauer limit.* Presented at: Quantum Thermodynamics of Non-Equilibrium Systems (QTDNEQ20), online.
- *09/2019: Autonomous phonon-induced steady-state coherence in double quantum dot systems.* Presented at: 12th conferenza Italian Quantum Information Science (IQIS 2019), Milano (Italy).
- *03/2019: Quantum work statistics and resource theories: Bridging the gap through Rényi divergences.* Presented at: II Workshop on Quantum Physics Information and Thermodynamics, International Institute of Physics - UFRN, Natal (Brazil).
- *06/2016: Non-equilibrium Landauer principle based on the two-time measurement protocol.* Presented at: Advanced Quantum Mechanics Meeting 2016 (AQM16), Sant' Eraso (Italy).
- *09/2015: Single Photon Observables and Preparation Uncertainty Relations.* Presented at: workshop FQT2015, Laboratori Nazionali di Frascati (LNF) - INFN, Frascati (Italy).
- *08/2015: Energy backflow in non-Markovian open quantum systems.* Presented at: workshop Non-Markovian Quantum Dynamics 2015 (NMQD15), Cortona (Italy).

- 06/2015: *Energy backflow in presence of non-Markovian dynamics*. Presented at: workshop Applied Quantum Mechanics AQM 2015, Modena (Italy).

8.5.3. Poster presentations

- 09/2019: *Thermodynamic Uncertainty Relations from Exchange Fluctuation Theorems*. Presented at: conference ‘Frontiers of Quantum Thermodynamics’, Exeter (UK).
- 12/2018: *Quantum work statistics and resource theories: Bridging the gap through Rényi divergences*. Presented at: Eurotherm Seminar No. 111, Nanoscale and Microscale Heat Transfer VI, Levi (Finland).
- 05/2018: *Autonomous generation of steady-state coherences by system-bath interaction*. Presented at: SPICE workshop, Quantum Thermodynamics and Transport, Mainz (Germany).
- 09/2017: *Full-counting statistics approach to non-equilibrium quantum Landauer bound*. Presented at: Second Arctic School on Open Quantum Systems and Thermodynamics, Kevo Research Station (Finland).
- 04/2017: *Full-counting statistics approach to non-equilibrium quantum Landauer bound*. Presented at: 640. WE-Heraeus-Seminar on “Non-Markovianity and Strong Coupling Effects in Thermodynamics”, Bad Honnef Physikzentrum (Germany). The poster won the first prize as Best Poster (75€).
- 03/2017: *Energy backflow measure in non-Markovian open quantum systems*. Presented at: Fifth Quantum Thermodynamics Conference (QTD5) in Oxford (UK).
- 06/2016: *Energy backflow measure in non-Markovian open quantum systems*. Presented at: Symposium on Mathematical Physics “GKSL Master Equation - 40 Years After”, University of Torún, Torún (Poland).
- 02/2015: *Estimators for the validity of the Quantum Regression Theorem in non-Markovian open quantum dynamics*. Presented at: 51st Winter School of Theoretical Physics “Irreversible dynamics: non-linear, non-local and non-Markovian manifestations”, Ładek Zdrój (Poland).
- 01/2015: *Single-photon Observables and Preparation Uncertainty Relations*. Presented at: INRIM event “Fundamental physics with light and atoms”, Torino (Italy).
- 06/2014: *Non-Markovianity versus the validity of the Quantum Regression Theorem*. Presented at: 46th Symposium on Mathematical Physics “Information Theory and Quantum Physics”, University of Torún, Torún (Poland).

8.6. Scientific dissemination.

Over the years, I have actively participated both in the dissemination of my research to the public as well as to the organization of events that would promote science. On the former aspect, I always advertised my publications on social media, such as Facebook, ResearchGate and Twitter, as well as contributed to news articles that make the results accessible to the public.

My papers have in fact collected a total of 29 News articles (including two from national

newspapers), 1 Perspective (<https://quantum-journal.org/views/qv-2022-09-26-68/>) and 8 blog posts.

Furthermore, I have always participated in the European Researcher's night event. Finally, as part of the QuSys group at Trinity College Dublin, I have contributed to the setup and organization of the online series of seminars "Quarantine Thermo" on YouTube during the Covid pandemics, which has attracted 475+ subscribers and thousands of views.

9. Additional technical skills.

- Programming languages: 1. **Python, Mathematica: Full Proficiency.**
2. Matlab, C++, Julia, Labview: Intermediate.
- Since 2017: Peer-Reviewer activity for the following international journals: NPJ Quantum Information, Physical Review Letters, Physical Review A, Physical Review E, Physical Review X Quantum, Quantum, Science Advances, Physics Letters A e Physica Scripta.
- 2021: Committee member for Ph.D. defense. Candidate name: Marie Grünbein, Freie Universität Berlin.
- Languages: 1. Italian: Mother tongue.
2. English: Proficiency.
3. French: Intermediate.
4. German and Czech: Basic.

Date and time,

05/06/2024, Pavia

Signature


