

IL PRESENTE ALLEGATO COSTITUISCE UNO SCHEMA-TIPO, NEL QUALE SONO INDICATE ALCUNE VOCI A MERO TITOLO ESEMPLIFICATIVO, PERTANTO PUO' ESSERE MODIFICATO/INTEGRATO DAL CANDIDATO ADATTANDOLO ALLE PECULIARITA' DELLA PROPRIA ATTIVITA' SCIENTIFICO-PROFESSIONALE

ALL. B

Decreto Rettore Università di Roma "La Sapienza" n 1771/2025 del 16.06.2025

AI FINI DELLA PUBBLICAZIONE

FEDERICO CAROLLO

## Curriculum Vitae

Place: Coventry

Date: 29<sup>th</sup> of July 2025

### Part I – General Information

Full Name	
Date of Birth	
Place of Birth	
Citizenship	
Permanent Address	
Mobile Phone Number	
E-mail	
Spoken Languages	

### Part II – Education

Type	Year	Institution	Notes (Degree, Experience,...)
University graduation	2007	Università di Genova	Engineering 108/110
Post-graduate studies	2010	Università di Genova	Engineering 110/110 cum laude
University graduation	2012	Università di Trieste	Physics 110/110 cum laude
PhD	2016	Università di Trieste	Physics

### Part III – Appointments

#### IIIA – Academic Appointments

Start	End	Institution	Position
11/2024	Ongoing	Coventry University	Associate Professor
01/2020	11/2024	Universität Tübingen	Post-doctoral research fellow
10/2016	12/2019	University of Nottingham	Post-doctoral research fellow

## Part IV – Teaching experience

Year	Institution	Lecture/Course
2026	Coventry University	Lecturer: Quantum information and quantum communication
Sept.2025	Coventry University	Lecturer: Further calculus and complex analysis
2022	Universität Tübingen	Lecturer: Large deviation approach to non-equilibrium systems
2021	Universität Tübingen	Tutor: Classical field theory
2021	Universität Tübingen	Lecturer: Large deviation approach to non-equilibrium physics
2020	Universität Tübingen	Tutor: Theory of quantum information

## Part V - Society memberships, Awards and Honors

Year	Title
2025	Abilitazione scientifica nazionale: prima fascia settore 02/B2
2025	Abilitazione scientifica nazionale: seconda fascia settore 02/B2
2025	Abilitazione scientifica nazionale: seconda fascia settore 02/A2

## Part VI - Funding Information [grants as PI-principal investigator or I-investigator]

Year	Title	Program	Grant value
2023	Co-PI	QuantERA call 2023	Tot: ~1.000.000 EUR
2021	PI	Eliteprogram for postdocs	130.000 EUR
2023	Contributor/Investigator	DFG Research Unit 5522	Tot: ~4.000.000 EUR
2022	Contributor/Investigator	DFG Research Unit 5413	Tot: ~4.000.000 EUR

## Part VII – Research Activities

Keywords	Brief Description
Open quantum systems	
Many-body systems	
Large deviations	
Quantum cellular automata	

## Part VIII – Summary of Scientific Achievements

Product type	Number	Data Base	Start	End
Papers [international]	86	Scopus	2013	2025
Papers [preprints]	5	Arxiv		

Total Impact factor	400
Total Citations	1586
Average Citations per Product	18.44

Hirsch (H) index	23
Normalized H index*	2.3

\*H index divided by the academic seniority.

## Part IX– Selected Publications

List of the publications selected for the evaluation. For each publication report title, authors, reference data, journal IF (if applicable), citations, press/media release (if any).

[1] “*Non-Gaussian dynamics of quantum fluctuations and mean-field limit in open quantum central spin systems*”

Federico Carollo

[Physical Review Letters 131, 227102 \(2023\)](#)

Impact Factor: 8.1

Citations: 7 – 17 (Scopus – Google Scholar)

[2] “*Continuous sensing and parameter estimation with the boundary time-crystal*”

A. Cabot, Federico Carollo, I. Lesanovsky

[Physical Review Letters 132, 050801 \(2024\)](#)

Selected for the Physical Review Letters Collection of the year 2024

Impact Factor: 9

Citations: 23 – 56 (Scopus – Google Scholar)

[3] “*Quantum thermodynamics of boundary time-crystals*”

Federico Carollo, I. Lesanovsky, M. Antezza, G. De Chiara

[Quantum Science and Technology 9, 035024 \(2024\)](#)

Featured in “the quantum record” and discussed during a one-hour podcast discussion.

Impact Factor: 5

Citations: 7 – 20 (Scopus – Google Scholar)

[4] “*Exponentially accelerated approach to stationarity in Markovian open quantum systems through the Mpemba effect*”

Federico Carollo, A. Lasanta, I. Lesanovsky

[Physical Review Letters 127, 060401 \(2021\)](#)

Impact Factor: 9.185

Citations: 73 – 121 (Scopus – Google Scholar)

[5] “*Spreading of correlations in Markovian open quantum systems*”

V. Alba, Federico Carollo

[Physical Review B 103, L020302 \(2021\)](#)

Editors’ Suggestion

Impact Factor: 3.908

Citations: 58 – 93 (Scopus – Google Scholar)

[6] “*Exactness of mean-field equations for open Dicke models with an application to pattern retrieval dynamics*”

Federico Carollo, I. Lesanovsky

[Physical Review Letters 126, 230601 \(2021\)](#)

Impact Factor: 9.185

Citations: 52 – 83 (Scopus – Google Scholar)

[7] “*Reaction-Limited Quantum Reaction-Diffusion Dynamics*”

G. Perfetto, Federico Carollo, J. P. Garrahan, I. Lesanovsky

[Physical Review Letters 130, 210402 \(2023\)](#)

Editors' Suggestion

Impact Factor: 8.1

Citations: 18 – 30 (Scopus – Google Scholar)

[8] “*Dynamical phases and quantum correlations in an emitter-waveguide system with feedback*”

G. Buonaiuto, Federico Carollo, Beatriz Olmos, I. Lesanovsky

[Physical Review Letters 127, 133601 \(2021\)](#)

Impact Factor: 9.185

Citations: 25 – 40 (Scopus – Google Scholar)

[9] “*Thermodynamics of quantum trajectories on a quantum computer*”

M. Cech, I. Lesanovsky, Federico Carollo

[Physical Review Letters 131, 120401 \(2023\)](#)

Impact Factor: 8.1

Citations: 7 – 16 (Scopus – Google Scholar)

[10] “*Nonequilibrium dark space phase transition*”

Federico Carollo, I. Lesanovsky

[Physical Review Letters 128, 040603 \(2022\)](#)

Impact Factor: 8.6

Citations: 12 – 18 (Scopus – Google Scholar)

[11] “*Large deviation full counting statistics in adiabatic open quantum dynamics*”

P. J. Paulino, I. Lesanovsky, Federico Carollo

[Physical Review Letters 132, 260402 \(2024\)](#)

Impact Factor: 9

Citations: 4 – 6 (Scopus – Google Scholar)

[12] “*Applicability of mean-field theory for time-dependent open quantum systems with infinite-range interactions*”

Federico Carollo, I. Lesanovsky

[Physical Review Letters 133, 150401 \(2024\)](#)

Impact Factor: 9

Citations: 1 – 7 (Scopus – Google Scholar)

## Part X– Reviewing activities

Journals      Reviewer for: Nature Physics, Nature Communications, Physical Review X, Physical Review Letters, Physical Review X Quantum, Physical Review A/B/E, Physical Review Research, Quantum, New Journal of Physics, Journal of Physics A: Mathematical and Theoretical, Europhysics Letters, Scipost Physics, Journal of Statistical Mechanics: Theory and Experiments, Journal of high energy Physics, Chaos: An Interdisciplinary Journal of Nonlinear Science

Grants      Reviewer for: ERC Starting Grant, Swiss National Science Foundation, ETH Zurich Grants, FWF Austrian Science Fund

## Part XI– Recent talks and seminars

■ (Upcoming) Invited Speaker: “*6<sup>th</sup> Nottingham Workshop on Quantum Non-Equilibrium Dynamics. Open Quantum Systems: Learning, Control and Thermodynamics.*” – Nottingham/UK  
24-26/09/2025

■ (Upcoming) Invited Lecturer: “*Summer School on Quantum Matter out of Equilibrium*” – Granada/Spain 1-5/09/2025

- Seminar: *Unveiling emergent phenomena in “digital” quantum trajectories*, TCM Seminars – University of Cambridge/UK 24/07/2025
- Seminar: *Non-equilibrium phase transitions in open quantum systems: Universality, simulation, and “advantage*, Phasecraft Ltd (Quantum start-up company) – Bristol/UK 16/05/2025
- Seminar: *Biassing open dynamics and exploring many-body effects in “digital” quantum trajectories through a thermodynamic approach*, Birmingham Theory Seminars – University of Birmingham/UK 20/03/2025
- Seminar: *Thermodynamic approach to digital quantum trajectories*, Physics Theory Group Seminars – University of Warwick/UK 14/03/2025
- Seminar: *A thermodynamic framework for exploring and controlling quantum trajectories on quantum computers*, French-German Doctoral College and L4 Seminar – 10/03/2025
- Contributed Talk: *Absorbing state phase transitions in long-range interacting quantum spin systems*, 2<sup>nd</sup> Retreat DFG Research Unit 5413 – Kloster Heiligkreuztal/Germany 22-23/02/2024
- Contributed Talk: *Spreading of correlations in open quantum systems*, Collaborative Workshop on transport – Max Planck Institut für Quantenoptik Garching/Germany 17-18/01/2024
- Seminar: *Absorbing state phase transitions in open quantum systems and quantum cellular automata*, 5<sup>th</sup> QuCoLiMa Talks – University of Mainz/Germany 05/12/2023
- Invited Talk: *Biassing open quantum dynamics on quantum computers*, 5<sup>th</sup> Nottingham Workshop on Quantum Non-Equilibrium Dynamics “Emergent and collective phenomena, thermodynamics and fluctuations: From fundamentals to the next generation of quantum devices” – University of Nottingham/UK 13-15/11/2023
- Invited Talk: *Quantum machine learning with open quantum systems*, Workshop “NISQ computing without variational algorithms” – HQS Quantum Simulations GmbH, Germany 7-9/11/2023
- Invited Talk: *Absorbing state phase transitions in quantum cellular automata*, Workshop “Tensor Networks for Constrained Systems – Kavli Institute of Nanoscience, TU Delft/NL 16-18/10/2023
- Contributed Talk: *Thermodynamics of quantum trajectories on a quantum computer*, 15<sup>th</sup> Italian Quantum Information Science Conference – University of Trieste/IT 18-22/09/2023
- Invited Talk: *Numerical simulation of open quantum many-body dynamics with tensor networks: absorbing-state phase transitions and long-range interactions*, Dynamical low-rank approximation: New horizons – EPF Lausanne/CH 22-24/05/2023
- Contributed Talk: *Absorbing state phase transitions in long-range interacting quantum spin systems*, 1<sup>st</sup> Retreat DFG Research Unit 5413 – Kloster Heiligkreuztal/Germany 15-16/02/2023
- Invited Talk: *Nonequilibrium phase transitions in open quantum systems with absorbing states*, JSPS London Symposium – University of Nottingham/UK 12-15/12/2022
- Contributed Talk: *Absorbing state phase transitions in long-range interacting quantum spin systems*, Kick-off meeting DFG Research Unit 5413 – University of Tübingen/Germany 07/10/2022
- Poster: *Exponentially accelerated approach to stationarity in Markovian open quantum systems*,

Quantum many-body physics in the presence of an environment – CY Cergy Paris Université /France 7-9/06/2022

- Invited Talk: Accelerating the approach towards stationarity in Markovian open quantum systems through the Mpemba effect, 12<sup>th</sup> Nottingham Symposium on Qunatum Systems Nottigham/UK 04/2022
- Contributed Talk: Nonequilibrium time-crystal quantum engine, DPG Spring Meeting Erlangen/Germany 03/2022
- Seminar: Nonequilibrium many-body quantum engines, University of Tübingen/Germany 06/2021
- Invited Talk: Nonequilibrium many-body quantum engine driven by time-translation symmetry breaking, 11<sup>th</sup> Nottingham Symposium on Quantum Systems, Nottingham/UK (04/2021)
- Seminar: Mpemba effect in Markovian open quantum systems, University of Granada/Spain 04/2021
- Seminar: Nonequilibrium pattern-recognition phase transition in open quantum multimode Dicke models, MPI for the Science of Light – Erlangen/Germany 16/02/2021
- Seminar: Non-equilibrium absorbing state phase transition in open quantum spin chains, University of Granada/Spain (03/2019)
- Invited Talk: Current fluctuations in boundary-driven quantum spin chains, Transport in Strongly Correlated Quantum Systems Conference, Natal/Brazil (07/2018)
- Contributed Talk: Current fluctuations in boundary-driven quantum spin chains, Conference on Non-equilibrium Systems "CONES 2018", London/UK (06/2018)
- Seminar: Current Fluctuations in boundary-driven quantum spin-chains, University of Trieste/Italy 03/2018
- Seminar: Quantum entanglement in mesoscopic systems, Jagiellonian University, Kraków/Poland 30/05/2016
- Poster: Macroscopic Entanglement, WE-Heraeus Seminar, Bad Honnef/Germany 17-23/01/2016
- Seminar: Non-Markovian many-body dynamics, Analysis, Math-Phys, and Quantum, SISSA, Trieste/Italy 05/11/2015
- Seminar: Non-Markovian mean-field dissipative dynamics, University Roma Tre/Italy 03/11/2015
- Contributed Talk: Mean-field dissipative dynamics in infinite quantum systems, 8<sup>th</sup> Italian Quantum Information Science Conference, Monopoli/Italy 10-12/09/2015
- Invited Lecturer: Quantum fluctuations and mesoscopic dissipative dynamics, 51<sup>st</sup> Winter School of Theoretical Physics, Ladek Zdroj/Poland 08-14/02/2015
- Contributed Talk: Environment induced entanglement in mesoscopic systems, 8<sup>th</sup> Mini-Symposium “On Entanglement” University of Vienna/Austria 10/12/2014
- Contributed Talk: Environment induced entanglement in mesoscopic systems, Quantum Roundabout Nottingham/UK 29/06/2014-02/07/2014
- Contributed Talk: Fluctuations algebra and mesoscopic entanglement, Current Problems in

## Part XII– Outreach and public engagement

Apr–Jun 2025 Co-organiser and facilitator for three skill-development workshops “CovenDRI” for early-career researchers in theoretical physics and applied mathematics. Themes of the workshops are: *Developing independence as a researcher; Managing a research group; Applying for funding*

Feb. 2025 Organisation of “Quantum Coventry Workshop: Many-body systems, non-equilibrium dynamics and quantum computing” (see webpage <https://iop.eventsair.com/qwc2025/> for details). Two-day event with 45 attendees, 11 invited speakers plus 5 contributed speakers and poster session.

Feb. 2025 Press release from Coventry University on the work “Thermodynamics of coupled time crystals with an application to energy storage”, arXiv:2411.04836 <https://www.coventry.ac.uk/news/2025/coventry-university-time-crystals-quantum-batteries/>.

Jan. 2025 Letter on continuous sensing with time crystals [PRL 132, 050801 (2024)] selected for [Physical Review Letters collection of the year 2024](#).

Jan. 2025 Visit to [Whoberley Hall Primary School](#) (Coventry, UK) to talk about “working in science” and basic physics ideas.

Nov. 2024 Article appeared on New Scientist on my manuscript “Thermodynamics of coupled time crystals with an application to energy storage”, arXiv:2411.04836 <https://www.newscientist.com/article/2456433-quantum-time-crystals-could-be-used-to-store-energy/>.

Aug. 2024 Podcast discussion for the series “The Quantum Feedback Loop” hosted by James Myers. The podcast title is “Dr. Federico Carollo on the intriguing present and future potential of time crystals” (<https://rss.com/podcasts/quantum-feedback/1668392/>).

2023 Article appeared on the New Scientist on my manuscript “Rydberg-ion flywheel for quantum work storate”, Phys. Rev. A 108, L050201 (2023). <https://www.newscientist.com/article/2399060-quantum-flywheel-could-be-fashioned-from-super-sized-charged-atoms/>.

2020 Article on the work “Building continuous time crystals from rare events”, Phys. Rev. Lett. 125, 160601 (2020), in collaboration with researchers from Granada. <https://canal.ugr.es/noticia/cientificos-de-la-ugr-logran-crear-cristales-de-tiempo-un-nuevo-estado-de-la-materia-empleando-un-superordenador/>.

## Part XIII– Supervision of students

Sept. 2025 – Supervision (first supervisor) of **PhD student** (Liv Hammer) – Coventry University

2024 – Supervision (second supervisor) of **PhD student** (Uddhav Sen) – Coventry University

2022 – 2025 Supervision (first supervisor) of **PhD student** (Paulo J. Paulino) working on my project selected for funding within Eliteprogram für Postdocs of the Baden-Württemberg Stiftung – University of Tübingen (GER)

2023	Currently supervised <b>Master students</b> Moritz Eissler (Active quantum matter), Olivier Wieczorek (Quantum fluctuations across absorbing-state phase transitions), Paul Haffner (Cavity-atom systems with multi-level atoms and few bosonic modes) – University of Tübingen (GER)
2023	Currently supervised <b>Bachelor students</b> Jan-Erik Fitzner (Machine learning absorbing state phase transitions) – University of Tübingen (GER)
2024	Supervision of <b>Bachelor student</b> <u>Paul Haffner</u> . Thesis: “Nonequilibrium phase diagram of an atom-cavity system with three-level atoms” – University of Tübingen (GER)
2024	Supervision of <b>Master student</b> <u>Robert Mattes</u> . Thesis: “Emergent mean-field dynamics in open quantum systems with long-range interactions” – University of Tübingen (GER)
2024	Supervision of <b>Bachelor student</b> <u>Oliver Wieczorek</u> . Thesis: “Large deviations in systems with absorbing states” – University of Tübingen (GER)
2023	Supervision of <b>Master student</b> <u>Giovanni Cemin</u> . Thesis: “Inferring interpretable dynamical generators of local quantum observables from projective measurements through machine learning” – University of Tübingen (GER)
2023	Supervision of <b>Master student</b> <u>Marcel Cech</u> . Thesis: “Quantum simulation of biased open-system dynamics” – University of Tübingen (GER)
2022	Supervision of <b>Master student</b> <u>Mario Boneberg</u> . Thesis: “Quantum fluctuations and correlations in open quantum Dicke models” – University of Tübingen (GER)
2022	Supervision of <b>Master student</b> <u>Markus Gnann</u> . Thesis: “Quantum contact process with $Z_2$ symmetry” – University of Tübingen (GER)
2015	Supervision of <b>Master student</b> <u>Jacopo Surace</u> . Thesis: “Entangling two harmonic chains through a common bath” – University of Trieste (ITA)
2023	Supervision of <b>Bachelor student</b> <u>Filip Bojko</u> . Thesis: “Simulating absorbing phase transitions with quantum generalized Domany-Kinzel automata” – University of Tübingen (GER)
2023	Supervision of <b>Bachelor student</b> <u>Moritz Eissler</u> . Thesis: “Entanglement spreading in diffusive quantum trajectories of noninteracting fermionic chains” – University of Tübingen (GER)
2023	Supervision of <b>Bachelor student</b> <u>Robert Mattes</u> . Thesis: “Time-crystal phase transition and quantum correlations in a driven-dissipative spin-boson model” – University of Tübingen (GER)
2022	Supervision of <b>Bachelor student</b> <u>Leah Muhle</u> . Thesis: “Analysing quantum trajectories near a time-crystal phase transition using collision models” – University of Tübingen (GER)
2022	Supervision of <b>Bachelor student</b> <u>Simon Kochsiek</u> . Thesis: “The quantum Mpemba effect in simple spin systems” – University of Tübingen (GER)

DATA E FIRMA