
Andrea De Luca

Curriculum vitae

Laboratoire de Physique de l'École Normale Supérieure
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Personal information

Date of birth 28th April 1985

Place of birth Taranto, Italy

Citizenship Italian

Research positions

2025 - present **CNRS Chargé de recherche (CRCN)**, *LPENS – École Normale Supérieure, PSL*, Paris, France

09/2019 - 2025 **CNRS Chargé de recherche (CRCN)**, *LPTM – CY Cergy Paris Université*, Cergy, France

05/2018 - **Marie Curie Individual Fellowship**, *The Rudolf Peierls Centre for Theoretical Physics*,
08/2019 Oxford, United Kingdom

10/2016 - **Postdoc Research assistant**, *The Rudolf Peierls Centre for Theoretical Physics*,
04/2018 Oxford, United Kingdom

10/2014 - **Postdoc**, *CNRS – LPTMS*, Orsay (Paris), France
09/2016

10/2012 - **Junior Research Chair**, *Institut P. Meyer – École Normale Supérieure*, Paris, France
09/2014

Education

11/2008 - **PhD in Statistical Physics**, *SISSA International School for Advanced Studies*, Trieste,
09/2012 Italy, A journey into localization, integrability and thermalization
Supervisor: Antonello Scardicchio
Co-supervisor: Giuseppe Mussardo

09/2003 - **Diploma di Licenza**, *Scuola Normale Superiore*, Pisa, Italy, 70/70 with honors
10/2008

09/2006 - **Master of Science in Theoretical Physics**, *Università di Pisa*, Pisa, Italy, 110/110
09/2008 with honors

10/2003 - **Bachelor of Science in Theoretical Physics**, *Università di Pisa*, Pisa, Italy, 110/110
07/2006 with honors

Research interests

Quantum chaos Spectral form factor, random unitary circuits, random-matrix universality in extended systems, eigenstate correlations

Monitored dynamics	Measurement-induced phase transitions, purification, non-unitary evolution, weak measurements
Quantum information	Deep thermalization and projected ensembles, quantum state designs, anticoncentration, nonstabilizerness
Integrability	Generalized hydrodynamics, quantum transport, integrability breaking, exact correlation functions
Disordered systems	Many-body localization, Anderson localization on trees, directed polymers, yield stress fluids

Languages

Italian	Native speaker
English	Fluent
French	Fluent
Russian	Basic

Computer skills

Programming	C, C++, Python, Javascript, HTML5, Perl, PHP, SQL
Software	Mathematica, Gnuplot, Matlab

Teaching

09/2024	Lecturer at Nordita Summer School – Universal aspects of monitored many-body systems
02/2020	Lecturer in CYU (Master / PhD): Random matrices and quantum chaos
10/2017	Tutor for Topological Quantum Theory – Prof. Steve Simon
02/2017	Lecturer at School on Statistical Field Theories (GGI – Florence)
04/2014 - 04/2016	Tutor for statistical physics at ESPCI (16h per year) – Prof. Tony Maggs
02/2014	French teaching habilitation in condensed matter (Qualification MDC sec. 29)

Supervision of students / postdocs

09/2025 - present	PhD co-supervision (with L. Cantini) of C. Boyer
09/2023 - present	PhD supervision of F. Gerbino
09/2023 - 2025	Postdoc supervision of G. Giachetti (ANR – TamEnt) → Marie Curie IF, LPENS
09/2022 - 2025	PhD co-supervision (with J. De Nardis) of A. Tiutiakina → King's College London
09/2022 - present	PhD co-supervision (with P. Ribeiro) of J. Costa
09/2020 - 2024	PhD co-supervision (with T. Prosen) of A. Christopoulos → University of Ljubljana (postdoc)
09/2020 - 2023	PhD co-supervision (with A. Rosso) of V. M. Schimmenti → postdoc (Dresden)
01/2016 - 2019	PhD co-supervision (with J. T. Chalker) of A. Chan → PCTS fellow (Princeton)
01/2016 - 2019	PhD co-supervision (with G. Mussardo) of A. Bastianello → postdoc in the group of J.-S. Caux
09/2015 - 2018	PhD co-supervision (with A. Rosso) of I. Rodríguez Arias → machine learning startup

Honors, awards and grants

03/2021	ANR JCJC <i>TamEnt</i> , 176k€ (2021 - 2025), principal investigator
01/2018	Marie Curie Individual Fellowship (2018 - 2020)
01/2014	Project winner of “Palm – LabEx” grant (1st place)
10/2012	“Institut Philippe Meyer” postdoc position
10/2008	Admission to the PhD course in Statistical Physics at SISSA, Trieste (1st place)

09/2003 - Admission at the “Corso Ordinario” (undergraduate studies) of Scuola Normale Superiore,
10/2008 Pisa. The admission is granted after passing a highly-selective examination, composed of two written and two oral tests in Mathematics and Physics. The thirty best candidates for scientific disciplines are admitted. Scuola Normale Superiore does not substitute the studies at the University of Pisa and requires the students to further deepen their knowledge in their subjects by taking additional courses and exams every year. The permanence in the institution is confirmed at the end of every academic year after verification that all the exams are passed with very good grades. I was admitted as fellow in September 2003 and successfully completed my studies in the prescribed 5 years.

Conference and school organisation

- 09/2026 **Fluctuations and Randomness in Many-body Evolution (FRAME2026)**, Institut Pascal, Université Paris-Saclay, Orsay, Co-organiser
with L. Foini (IPhT) and L. Mazza (LPTMS)
- 05-06/2026 **QLANDS2026 – Quantum Landscapes: Non-Equilibrium, Circuits, and Complexity**, CY Advanced Studies, Neuville-sur-Oise, Co-organiser
with P. Ribeiro (Lisbon), J. De Nardis (CYU), K. Klobas (Birmingham)
- 03/2026 **Threefold Quantum: Theory, Experiment, Computation Out of Equilibrium**, École Normale Supérieure, Paris, Co-organiser
with S. Scopa and A. Bastianello
- 09/2025 **Universality in non-equilibrium quantum matter: thermalization, hydrodynamics, entanglement**, Castello Capuano, Pollica, Italy, Co-organiser
with L. Delacrétaz (Chicago), S. Pappalardi (Cologne), M. Serbyn (IST Austria), F. Surace (Caltech)
- 10/2024 **OpenQMBP2024 – Open quantum many-body physics**, Institut Pascal, Université Paris-Saclay, Orsay, Co-organiser
with J. De Nardis, Z. Lenarcic, M. Schirò
- 06/2023 **OpenQMBP2023 – New perspectives in the out-of-equilibrium dynamics of open many-body quantum systems**, Institut Pascal, Université Paris-Saclay, Orsay, Co-organiser
with J. De Nardis, Z. Lenarcic, L. Mazza, G. Pagano, M. Schirò
- 06/2022 **OpenQMBP2022 – Quantum many-body physics in the presence of an environment**, CY Advanced Studies, Neuville-sur-Oise, Co-organiser
with J. De Nardis and L. Mazza

Invited conference talks and lectures

- 05/2025 **Classical, Quantum & Probabilistic Integrable Systems – Novel Interactions and Applications, *Monitored quantum systems, product of random matrices and permutations***, Harvard CMSA, Cambridge MA, Invited participant and speaker
- 01/2025 **Theory Colloquium (invitation by S. Pappalardi)**, University of Cologne, Speaker
- 09/2024 **Summer school on Quantum Chaos, Dissipation and Information**, Nordita – Stockholm, Lecturer
- 08/2024 **Novel emergent phenomena in quantum many-body dynamics**, Les Houches, Plenary speaker
- 04/2023 **Dynamical foundations of many-body quantum chaos, *Projected ensemble and the membrane picture***, Institut Pascal, Saclay, Speaker
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- 09/2022 **Integrable and chaotic dynamics, *Many-body quantum chaos***, Pokljuka, Slovenia, Speaker
- 05/2022 **Chaos and thermalisation**, GSCAEP – Graduate School, China, Speaker

Selected publications

- 2026 A. Sauliere, G. Lami, C. Boyer, J. De Nardis, and A. De Luca, *Universality in the anticoncentration of noisy quantum circuits at finite depths*, PRX Quantum **7**, 020365.
- 2026 J. Costa, P. Ribeiro, and A. De Luca, *Emergence of universality in transport of noisy free fermions*, Phys. Rev. Lett. **137**, 020403.
- 2026 G. Lami, A. De Luca, X. Turkeshi, and J. De Nardis, *Quantum state design and emergent confinement mechanism in measured tensor network states*, npj Quantum Information (2026).
- 2025 A. De Luca, C. Liu, A. Nahum, and T. Zhou, *Universality classes for purification in nonunitary quantum processes*, Phys. Rev. X **15**, 041024.
- 2025 B. Magni, A. Christopoulos, A. De Luca, and X. Turkeshi, *Anticoncentration in Clifford circuits and beyond: from random tensor networks to pseudo-magic states*, Phys. Rev. X **15**, 031071.
- 2025 X. Turkeshi, P. Calabrese, and A. De Luca, *Quantum Mpemba effect in random circuits*, Phys. Rev. Lett. **135**, 040403.
- 2023 P. Le Doussal, D. Bernard, A. Christopoulos, and A. De Luca, *Universal out-of-equilibrium dynamics of 1D critical quantum systems perturbed by noise coupled to energy*, Phys. Rev. X **13**, 011043.
- 2022 A. Chan, S. Shivam, D. A. Huse, and A. De Luca, *Many-body quantum chaos and space-time translational invariance*, Nature Comm. **13**, 7484.
- 2022 M. Collura, A. De Luca, D. Rossini, and A. Lerose, *Discrete time-crystalline response stabilized by domain-wall confinement*, Phys. Rev. X **12**, 031037.
- 2019 A. J. Friedman, A. Chan, A. De Luca, and J. T. Chalker, *Spectral statistics and many-body quantum chaos with conserved charge*, Phys. Rev. Lett. **123**, 210603.
- 2019 A. Biella, M. Collura, D. Rossini, A. De Luca, and L. Mazza, *Ballistic transport and boundary resistances in inhomogeneous quantum spin chains*, Nature Comm. **10**, 4820.
- 2019 C. Liu, A. De Luca, A. Rosso, and L. Talon, *Darcy's law for yield stress fluids*, Phys. Rev. Lett. **122**, 245502.
- 2018 A. Chan, A. De Luca, and J. T. Chalker, *Solution of a minimal model for many-body quantum chaos*, Phys. Rev. X **8**, 041019.
- 2015 A. De Luca and A. Rosso, *Dynamic nuclear polarization and the paradox of quantum thermalization*, Phys. Rev. Lett. **115**, 080401.
- 2014 A. De Luca, B. L. Altshuler, V. E. Kravtsov, and A. Scardicchio, *Anderson localization on the Bethe lattice: nonergodicity of extended states*, Phys. Rev. Lett. **113**, 046806.
- 2013 A. De Luca and A. Scardicchio, *Ergodicity breaking in a model showing many-body localization*, Europhys. Lett. **101**, 37003.

The complete list of publications (71 items) is available in the accompanying document and at www.andreadeluca.online/publications.
