

# Cécilia Lancien – Section 01 - Collège B1

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My main research interests include: asymptotic geometric analysis, random matrices and tensors, free probability, quantum information theory, quantum many-body physics.

## Employment

- SEPTEMBER 2021 – PRESENT: CNRS “chargée de recherche” at Université Grenoble Alpes (France).
- OCTOBER 2018 – AUGUST 2021: CNRS “chargée de recherche” at Université Toulouse 3 (France).
- SEPTEMBER 2016 – SEPTEMBER 2018: Postdoctoral researcher at Universidad Complutense de Madrid (Spain), under the direction of D. Pérez-García.
- SEPTEMBER 2013 – AUGUST 2016: PhD student at Université Lyon 1 (France) and Universitat Autònoma de Barcelona (Spain), under the co-advising of G. Aubrun and A. Winter.
- SEPTEMBER 2009 — AUGUST 2013: State-employed student at École Polytechnique Paris-Saclay (France).

## Selected publications (among 23 publications and preprints)

- C. Lancien, P. Oliveira Santos, P. Youssef. Central Limit Theorem for tensor products of free variables. *To appear in Can. J. Math.*
- N. Cheng, C. Lancien, G. Penington, M. Walter, F. Witteveen. Random tensor networks with nontrivial links. *Ann. Henri Poincaré* 25(4):2107–2212, 2024.
- M.A. Jivulescu, C. Lancien, I. Nechita. Multipartite entanglement detection via projective tensor norms. *Ann. Henri Poincaré* 23(11):3791–3838, 2022.
- C. Lancien, D. Pérez García. Correlation length in random MPS and PEPS. *Ann. Henri Poincaré* 23(1):141–222, 2022.
- M. Christandl, R. Ferrara, C. Lancien. Random private quantum states. *IEEE Trans. Inf. Th.* 66(7):4621–4640, 2020.
- M. Huber, L. Lami, C. Lancien, A. Müller-Hermes. High-dimensional entanglement in states with positive partial transposition. *Phys. Rev. Lett.* 121(200503), 2018.
- C. González-Guillén, C. Lancien, C. Palazuelos, I. Villanueva. Random quantum correlations are generically non-classical. *Ann. Henri Poincaré* 18(12):3793–3813, 2017.
- C. Lancien, S. Di Martino, M. Huber, M. Piani, G. Adesso, A. Winter. Should entanglement measures be monogamous or faithful? *Phys. Rev. Lett.* 117(060501), 2016.
- C. Lancien.  $k$ -extendibility of high-dimensional bipartite quantum states. *Random Matrices: Theory Appl.* 5(1650011), 2016.
- G. Aubrun, C. Lancien. Zonoids and sparsification of quantum measurements. *Positivity* 20(1):1–23, 2016.
- C. Lancien, A. Winter. Distinguishing multi-partite states by local measurements. *Commun. Math. Phys.* 323(2):555–573, 2013.

## Selected talks (among about 100 talks in conferences, workshops and seminars)

- 21<sup>st</sup> ICMP, session “Many-body quantum systems and condensed matter physics” (Strasbourg, France) – JULY 2024.
- CIRM conference “Mathematical aspects of the physics with non-self-adjoint operators” (Marseille, France) – JUNE 2024.
- 5<sup>th</sup> Entangle This workshop (Benasque, Spain) – JUNE 2023.
- ICMAT research term “Quantum information theory” (Madrid, Spain) – MARCH 2023.
- AMS-EMS-SMF joint meeting, session “Mathematical challenges in complex quantum systems” (Grenoble, France) – JULY 2022.
- MFO workshop “Geometry and optimization in quantum information” (Oberwolfach, Germany) – OCTOBER 2021.
- 16<sup>th</sup> TQC (Riga, Latvia) – JULY 2021.
- 4<sup>th</sup> Entangle This workshop (Madrid, Spain) – SEPTEMBER 2019.
- 14<sup>th</sup> QMath, session “Quantum information” (Aarhus, Denmark) – AUGUST 2019.

- 19<sup>th</sup> ICMP, session “Quantum information” (Montréal, Canada) – JULY 2018.
- MFO workshop “Operator spaces, quantum probability, quantum information” (Oberwolfach, Germany) – MAY 2018.
- Workshop “Quantum innovators in computer science and mathematics” (Waterloo, Canada) – SEPTEMBER 2017.
- 11<sup>th</sup> TQC (Berlin, Germany) – SEPTEMBER 2016.
- ICMA, workshop “Mathematical methods in quantum information” (Timisoara, Romania) – NOVEMBER 2015.
- BMC-BAMC joint meeting, workshop “Quantum information theory” (Cambridge, United-Kingdom) – MARCH 2015.
- 10<sup>th</sup> MAS days, session “Random matrix theory” (Toulouse, France) – AUGUST 2014.
- ICMAT intensive month “Operator algebras and quantum information” (Madrid, Spain) – JUNE 2013.
- 12<sup>th</sup> AQIS (Suzhou, China) – AUGUST 2012.

## Selected academic responsibilities

- Member of the commission C18 of the IUAP (JANUARY 2025 – PRESENT).
- Steering committee member of the research federation and the LabEx “QuantAlps”, in charge of the research axis “Quantum information & software” (SEPTEMBER 2022 – PRESENT).
- Editorial committee member of the SMF *Cours Spécialisés* (DECEMBER 2022 – PRESENT).
- Program committee co-chair for the conference BIID 2023 and program committee member for the conferences Q-Turn 2018 and 2020, QIP 2019 and 2022, TQC 2020, 2023 and 2025, QML@ECMLPKDD 2022.
- Reviewer for 3 PhD theses and committee member for 8 PhD theses.
- Selection committee member for 5 assistant professor positions.
- Evaluating expert for the Helmholtz investigator groups.
- Co-organization of the thematic programs “Analysis in quantum information theory” at IHP (Paris, France) – FALL 2017, “Operator algebras, groups and applications to quantum information” at ICMAT (Madrid, Spain) – SPRING 2019, “Random tensors” at IHP (Paris, France) – FALL 2024.
- Co-organization of 4 international conferences, 2 workshops, 3 schools, 3 seminars.

## Selected grants and awards

- Holder of 1 ANR grant “Investissement d’avenir” (OCTOBER 2020 – DECEMBER 2022).
- Member of 2 ANR grants “Projet de recherche collaborative” and 3 ANR grants “Projet générique”.
- Holder of 1 CNRS “Prime d’encadrement doctoral et de recherche” (NOVEMBER 2018 – NOVEMBER 2022).

## Selected teaching activities and student supervisions

- Graduate course “Probabilistic and geometric techniques in high dimension” in the M2RFM program of the Université Grenoble Alpes, France (JANUARY 2024 – APRIL 2024).
- Graduate course “Quantum information & dynamics” in the M2SIAM program of the Université Grenoble Alpes, France (SEPTEMBER 2023 – DECEMBER 2023 AND SEPTEMBER 2024 – DECEMBER 2024).
- Mini-course in the masterclass “Operator algebras, random matrices and quantum expander graphs” (Copenhagen, Denmark) – JUNE 2024.
- Mini-course in the autumn school of the GdR MEGA (Aussois, France) – OCTOBER 2022.
- Supervision of 1 PhD thesis, 3 Master research internships and 1 Bachelor research internship.