

# DYLAN LAPLACE MERMOUD

Postdoctoral researcher in discrete mathematics, quantum algorithms and algebraic combinatorics  
Unité de Mathématiques Appliquées, ENSTA, Institut Polytechnique de Paris  
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## PERSONAL INFORMATION

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Born in Saint-Michel (16), France, on October 25, 1996. French nationality.

## AREAS OF INTEREST

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Discrete mathematics, quantum algorithms, representation theory, Coxeter groups, algebraic combinatorics, combinatorial optimization, cooperative game theory.

## EMPLOYMENT

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**Postdoctoral researcher** Oct. 2023 – today

- ▷ Unité de Mathématiques Appliquées, ENSTA, Institut Polytechnique de Paris
- ▷ Secondary affiliation: CEDRIC laboratory, Conservatoire National des Arts et Métiers
- ▷ Supervisors: ANDREA SIMONETTO and SOUROUR ELLOUMI

**Teaching and research associate** Sept. 2022 – Aug. 2023

- ▷ Centre d'Économie de la Sorbonne, Université Paris I Panthéon-Sorbonne

**Doctoral contract employee** Sept. 2019 – Aug. 2022

- ▷ Centre d'Économie de la Sorbonne, Université Paris I Panthéon-Sorbonne

## EDUCATION

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**Doctoral degree**, Mathematics, *Université Paris I Panthéon-Sorbonne* Sept. 2019 – Sept. 2023

- ▷ Title: “[Geometry of Set Functions in Game Theory: Combinatorial and Computational Aspects](#)”
- ▷ Supervisors: MICHEL GRABISCH and PETER SUHDÖLTER
- ▷ Reviewers: TAMÁS SOLYMOSI and MARINA NUÑEZ, president of the jury: PHILIPPE BICH, jury members: JEAN-JACQUES HERINGS and PHILIPPE SOLAL

**Master degree**, Mathematics, *Sorbonne Université* Sept. 2017 – June 2019

**Bachelor degree**, Mathematics, *Sorbonne Université* Sept. 2014 – June 2017

## PUBLICATIONS, PROCEEDINGS, AND PREPRINTS

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### Publications

3. Variational quantum algorithms for permutation-based combinatorial problems: Optimal ansatz generation with applications to quadratic assignment problems and beyond  
LAPLACE MERMOUD, D., SIMONETTO, A., ELLOUMI, E.  
[Quantum](#), vol. 10, p. 1998 • 2026 • 36 pages • [arXiv.2509.05981v3](#)

2. Attraction of the core and the cohesion flow  
LAPLACE MERMOUD, D.  
[Theory and Decision](#), vol. 99, pp. 377–392 • 2025 • 15 pages • [arXiv.2507.02918](#)
1. Minimal balanced collections and their application to core stability and other topics of game theory  
LAPLACE MERMOUD, D., GRABISCH, M., SUDHÖLTER, P.  
[Discrete Applied Mathematics](#), vol. 341, pp. 60–81 • 2023 • 32 pages • [arXiv.2507.05898](#)

## Proceedings

1. Combinatorics on social configurations  
LAPLACE MERMOUD, D., POPOLI, P.  
[Electronic Proceedings in Theoretical Computer Science](#), vol. 403, pp. 128–133 • 2024 • 6 pages

## Preprints

6. On the closest balanced game  
GARCIA-SEGADOR, P., GRABISCH, M., LAPLACE MERMOUD, D., MIRANDA, P.  
[arXiv preprint arXiv.2601.15318](#) (Under review) • 2025 • 31 pages
5. Sampled-based guided quantum walk: Non-variational quantum algorithm for combinatorial optimization  
NZONGANI, U., LAPLACE MERMOUD, D., DI MOLFETTA, G., SIMONETTO, A.  
[arXiv preprint arXiv.2509.15138](#) (Under review) • 2025 • 27 pages
4. The algebraic structures of social organizations: the operad of cooperative games  
LAPLACE MERMOUD, D., ROCA I LUCIO, V.  
[arXiv preprint arXiv.2507.01969](#) (Under review) • 2025 • 50 pages
3. Diffusion in dynamic networks with time-varying inputs to allocate responsibility  
VAN DEN ENDE, R., LAPLACE MERMOUD, D.  
[arXiv preprint arXiv.2301.02728](#) • 2025 • 25 pages
2. Projection onto the core: An optimal reallocation to correct market failure  
LAPLACE MERMOUD, D.  
[arXiv preprint arXiv.2411.11810](#) • 2024 • 30 pages
1. On the formation of steady coalitions  
LAPLACE MERMOUD, D.  
[arXiv preprint arXiv.2410.05087](#) • 2024 • 21 pages

## RESEARCH VISITS

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- ▷ MICHEL GRABISCH at the [Algorithmic game theory in socioeconomics \(AGATE\)](#) center  
Charles University • one or two weeks • 2026 (forthcoming)
- ▷ MĀRIS OZOLS and KRYSTAL GUO at the [Discrete Mathematics and Quantum Information group](#)  
Universiteit van Amsterdam and CWI • two weeks • 2025
- ▷ STEFAN WÖRNER at the [Quantum Computational Science group](#)  
IBM Research Europe - Zurich • one week • 2025
- ▷ VICTOR ROCA I LUCIO at the [Laboratory for Topology and Neurosciences](#)  
École Polytechnique Fédérale de Lausanne (EPFL) • one week • 2023
- ▷ PIERRE POPOLI at the [Laboratory of Discrete Mathematics](#)  
Université de Liège • one week • 2023

## SUPERVISION

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- ▷ Bruno Galibert (2025), Master 1 student, on “Quantum circuit simplification”.
  - Funded by a Quantum-Saclay grant.
- ▷ Qui Loc Phan (2024), Master 1 student, on “Quantum circuit design and combinatorial optimization”.

## AWARDS AND FUNDINGS

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- ▷ Laureate of the *Quantum-Saclay* grant, one internship funding (2025).
- ▷ Laureate of the *Passeport pour le Master* scholarship from Sorbonne Université Foundation, fully funded 5 years of study (2014-2019).

## RESPONSIBILITIES

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- ▷ Member of the board of directors of Sorbonne Université (2018-2020), member of the board of the mathematics department of Sorbonne Université (2018-2020).

## REFEREEING

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- ▷ Journal of Mathematical Economics, 4OR - A Quarterly Journal of Operations Research, Annals of Operations Research.

## COMMUNICATIONS

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- ▷ Session organization
  1. “Quantum computing for combinatorial optimization” at [Programme Gaspard Monge \(PGMO\) days 2025](#), Palaiseau, France (2025).
- ▷ Upon invitation
  2. [SIAM Conference on Optimization \(OP26\)](#), Edinburgh, United Kingdom (forthcoming, 2026).
  3. 18th [Ordered Structures in Games and Decisions](#) in Michel Grabisch’s honor, Paris, France (2025).
  4. 16th [Ordered Structures in Games and Decisions](#) conference, Paris, France (2023).
  5. 22nd [Society for the Advancement of Economic Theory \(SAET\)](#) conference, Paris, France (2023).
  6. [GO22: Games and Optimization 2022](#), Saint-Étienne, France (2022).
- ▷ Conferences
  7. 20th [European Meeting on Game Theory \(SING20\)](#), Maastricht, The Netherlands (2025).
  8. [International Conference in Quantum Computing \(ICoQC2025\)](#), Paris, France (2025).
  9. 26th [ROADEF](#) congress, Champs-sur-Marne, France (2025).
  10. [Programme Gaspard Monge \(PGMO\) days 2024](#), Palaiseau, France (2024).
  11. 19th [European Meeting on Game Theory \(SING19\)](#), Besançon, France (2024).
  12. 13th [Random Generation of Combinatorial Structures. Polyominoes and Tiling \(GASCom\)](#), Bordeaux, France (2024).
  13. 18th [European Meeting in Game Theory \(SING18\)](#), Messina, Italy (2023).
  14. 26th [Coalition Theory Network \(CTN\)](#) conference, Bielefeld, Germany (2023).
  15. [Programme Gaspard Monge \(PGMO\) days 2021](#), Palaiseau, France (2021).

16. 16th [European Meeting in Game Theory \(SING16\)](#), Granada (remote), Spain (2021).

▷ Seminars

17. IBM Research Europe - Zurich, [Quantum Optimization project](#), Zurich, Switzerland (2025).

18. Université Aix-Marseille, [CANA](#) research group seminar, Marseille, France (2025).

19. [C12](#), R&D group seminar, Paris, France (2025).

20. Université Paris Cité, [IRIF](#) quantum team seminar, Paris, France (2025).

21. École Polytechnique, [PhIQus](#) team seminar, Palaiseau, France (2025).

22. Télécom Paris, [Curiosity](#) team seminar, Palaiseau, France (2025).

23. [Quandela](#), R&D group seminar, Massy, France (2025).

24. Conservatoire National des Arts et Métiers, [Combinatorial Optimization \(OC\)](#) group seminar, Paris, France (2025).

25. ENSTA - Institut Polytechnique de Paris, [Optimization and Command \(OC\)](#) group seminar, Palaiseau, France (2025).

26. Centre d'Économie de la Sorbonne, “[Mathématique Discrète, Optimisation, Décision](#)” seminar, Paris, France (2024).

27. Université de Franche-Comté, “[young researchers](#)” day, Besançon, France (2024).

28. Institut Henri Poincaré, [Junior Parisian seminar in game theory](#), Paris, France (2023).

29. ENSTA - Institut Polytechnique de Paris, [Optimization and Command \(OC\)](#) group seminar, Palaiseau, France (2023).

30. Paris School of Economics, [Doctorissimes](#), Paris, France (2022).

31. Centre d'Économie de la Sorbonne, Maths department days, Paris, France (2022).

32. Centre d'Économie de la Sorbonne, “[Network and Games](#)” seminar, Paris, France (2022).

33. Centre d'Économie de la Sorbonne, [PhD seminar](#), Paris, France (2021).

34. Institut Élie Cartan, [PhD seminar](#), Nancy, France (2021).

## TEACHING

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### Lectures

▷ Quantum computing 2025 – 2026  
MPRO & ensIIE • Master 2 in informatics • 6h

▷ Game theory 2024 – 2026  
Institut Polytechnique de Paris • Master 1 in mathematics • 7h30

### Tutorials

▷ Quantum computing 2025 – 2026  
MPRO & ensIIE • Master 2 in informatics • 15h

▷ Game theory 2024 – 2026  
Institut Polytechnique de Paris • Master 1 in mathematics • 10h

▷ Graph theory 2023 – 2026  
Institut Polytechnique de Paris • Master 1 in mathematics • 16h30

▷ Linear programming 2020 – 2023  
Université Paris I Panthéon-Sorbonne • Master 1 in mathematics • 24h

▷ Topology and differential calculus Université Paris I Panthéon-Sorbonne • Bachelor 3 in mathematics/informatics • 42h	2022 – 2023
▷ Microeconomics Université Paris I Panthéon-Sorbonne • Bachelor 3 in mathematics/informatics • 48h	2022 – 2023
▷ Linear algebra Université Paris I Panthéon-Sorbonne • Bachelor 2 in mathematics/informatics • 30h	2022 – 2023
▷ Linear algebra Université Paris I Panthéon-Sorbonne • Bachelor 3 in economics • 36h	2019 – 2023
▷ Python programming Université Paris I Panthéon-Sorbonne • Bachelor 1 in mathematics/informatics • 48h	2019 – 2020

## REFERENCES

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MICHEL GRABISCH

[michel.grabisch@univ-paris1.fr](mailto:michel.grabisch@univ-paris1.fr)

Honorary senior member of the Institut Universitaire de France

Professor Emeritus at Université Paris I Panthéon-Sorbonne

Head of the AGATE center and ERA chair holder at Charles University

SOUROUR ELLOUMI

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Professor at ENSTA, Institut Polytechnique de Paris

Head of the Optimization and Command team at ENSTA, Institut Polytechnique de Paris

Member of the Combinatorial Optimization team at Conservatoire National des Arts et Métiers

ANDREA SIMONETTO

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Research professor at ENSTA, Institut Polytechnique de Paris

Member of the Optimization and Command team at ENSTA, Institut Polytechnique de Paris

Member of the Combinatorial Optimization team at Conservatoire National des Arts et Métiers