

# DYLAN LAPLACE MERMOUD

Postdoctoral researcher in game theory, 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, differential equations on combinatorial structures.

## 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

- ▷ Jointly accredited by École Polytechnique and École Nationale des Ponts et Chaussées.

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

## PUBLICATIONS, PROCEEDINGS, AND PREPRINTS

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### Publications

11. 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, S.  
[Quantum](#), vol. 10, p. 1998 • 2026 • 36 pages • [arXiv.2509.05981v3](#)

10. 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](#)
9. 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

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

## Preprints

7. Scaling QAOA: transferring optimal adiabatic schedules from small-scale to large-scale variational circuits  
NZONGANI, U., LAPLACE MERMOUD, D., BRAIDA, A.  
[arXiv preprint arXiv.2602.14986](#) (Under review) • 2026 • 6 pages
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, Prague, Czech Republic • one or two weeks • 2026 (forthcoming)
- ▷ MĀRIS OZOLS and KRYSTAL GUO at the [Discrete Mathematics and Quantum Information group](#)  
Universiteit van Amsterdam and CWI, The Netherlands • two weeks • 2025
- ▷ STEFAN WÖRNER at the [Quantum Computational Science group](#)  
IBM Research Europe - Zurich, Suisse • one week • 2025
- ▷ VICTOR ROCA I LUCIO at the [Laboratory for Topology and Neurosciences](#)  
École Polytechnique Fédérale de Lausanne (EPFL), Suisse • one week • 2023
- ▷ PIERRE POPOLI at the [Laboratory of Discrete Mathematics](#)  
Université de Liège, Belgique • one week • 2023

## TEACHING

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### Lectures

- ▷ Quantum computing 2025 – 2026  
MPRO & ensIE • Master 2 in informatics • 6h
- ▷ Game theory 2024 – 2026  
ENSTA & Institut Polytechnique de Paris • Master 1 in mathematics • 7h30 • [Lecture notes](#)

### Tutorials

- ▷ Quantum computing 2025 – 2026  
MPRO & ensIE • Master 2 in informatics • 15h
- ▷ Game theory 2024 – 2026  
ENSTA & Institut Polytechnique de Paris • Master 1 in mathematics • 10h
- ▷ Graph theory 2023 – 2026  
ENSTA & 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 2022 – 2023  
Université Paris I Panthéon-Sorbonne • Bachelor 3 in mathematics/informatics • 42h
- ▷ Microeconomics 2022 – 2023  
Université Paris I Panthéon-Sorbonne • Bachelor 3 in mathematics/informatics • 48h
- ▷ Linear algebra 2022 – 2023  
Université Paris I Panthéon-Sorbonne • Bachelor 2 in mathematics/informatics • 30h
- ▷ Linear algebra 2019 – 2023  
Université Paris I Panthéon-Sorbonne • Bachelor 3 in economics • 36h
- ▷ Python programming 2019 – 2020  
Université Paris I Panthéon-Sorbonne • Bachelor 1 in mathematics/informatics • 48h

## 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. 27th [ROADEF congress](#), Tours, France (forthcoming, 2026).
8. 20th [European Meeting on Game Theory \(SING20\)](#), Maastricht, The Netherlands (2025).
9. [International Conference in Quantum Computing \(ICoQC2025\)](#), Paris, France (2025).
10. 26th [ROADEF congress](#), Champs-sur-Marne, France (2025).
11. [Programme Gaspard Monge \(PGMO\) days 2024](#), Palaiseau, France (2024).
12. 19th [European Meeting on Game Theory \(SING19\)](#), Besançon, France (2024).
13. 13th [Random Generation of Combinatorial Structures. Polyominoes and Tiling \(GASCom\)](#), Bordeaux, France (2024).
14. 18th [European Meeting in Game Theory \(SING18\)](#), Messina, Italy (2023).
15. 26th [Coalition Theory Network \(CTN\)](#) conference, Bielefeld, Germany (2023).
16. [Programme Gaspard Monge \(PGMO\) days 2021](#), Palaiseau, France (2021).
17. 16th [European Meeting in Game Theory \(SING16\)](#), Granada (remote), Spain (2021).

### ▷ Seminars

18. IBM Research Europe - Zurich, [Quantum Optimization project](#), Zurich, Switzerland (2025).
19. Université Aix-Marseille, [CANA](#) research group seminar, Marseille, France (2025).
20. [C12](#), R&D group seminar, Paris, France (2025).
21. Université Paris Cité, [IRIF](#) quantum team seminar, Paris, France (2025).
22. École Polytechnique, [PhIQus](#) team seminar, Palaiseau, France (2025).
23. Télécom Paris, [Curiosity](#) team seminar, Palaiseau, France (2025).
24. [Quandela](#), R&D group seminar, Massy, France (2025).
25. Conservatoire National des Arts et Métiers, [Combinatorial Optimization \(OC\)](#) group seminar, Paris, France (2025).
26. ENSTA - Institut Polytechnique de Paris, [Optimization and Command \(OC\)](#) group seminar, Palaiseau, France (2025).

27. Centre d'Économie de la Sorbonne, “[Mathématique Discrète, Optimisation, Décision](#)” seminar, Paris, France (2024).
28. Université de Franche-Comté, “[young researchers](#)” day, Besançon, France (2024).
29. Institut Henri Poincaré, [Junior Parisian seminar in game theory](#), Paris, France (2023).
30. ENSTA - Institut Polytechnique de Paris, [Optimization and Command \(OC\) group seminar](#), Palaiseau, France (2023).
31. Paris School of Economics, [Doctorissimes](#), Paris, France (2022).
32. Centre d'Économie de la Sorbonne, Maths department days, Paris, France (2022).
33. Centre d'Économie de la Sorbonne, “[Network and Games](#)” seminar, Paris, France (2022).
34. Centre d'Économie de la Sorbonne, [PhD seminar](#), Paris, France (2021).
35. Institut Élie Cartan, [PhD seminar](#), Nancy, France (2021).

## REFERENCES

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MICHEL GRABISCH

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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

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ANDREA SIMONETTO

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