

Paul Pegon

Curriculum Vitae

Maître de conférences, CEREMADE, Université Paris-Dauphine · Inria team MOKAPLAN

1. Presentation

Personal information

NAME	Paul Pegon
AGE	37
CITIZENSHIP	French
PROFESSIONAL ADDRESS	Université Paris-Dauphine Place du Maréchal de Lattre de Tassigny 75016 Paris, France
WEBPAGE	https://www.ceremade.dauphine.fr/~pegon/
E-MAIL ADDRESS	pegon@ceremade.dauphine.fr

Current position

2018–PRESENT “Maître de conférences” (Associate Professor) in Applied Mathematics (CNU section 26), *CEREMADE, Université Paris-Dauphine & member of the Inria team MOKAPLAN (Inria Paris)*

Education and professional experience

2017–2018 Temporary teaching and research position (ATER), *Université Paris-Sud*
2014–2017 PhD in Applied Mathematics, *Université Paris-Saclay* (supervisor: F. Santambrogio)
2012–2013 “Agrégation de mathématiques” (ranked 25/322)
2010–2014 Student at *École Normale Supérieure de Cachan* (“normalien”)

2. Research

Research interests

Optimal transport	Branched transport	Geometric measure theory
Calculus of variations	Γ -convergence	Quasi-convex analysis
Optimization	Network optimization	Partial differential equations

Research statement

My work mainly focuses on optimal transport (OT), along several axes.

Prior to my PhD, I studied structural properties of OT with oscillation-type or concave costs. A major axis of my research, started during my PhD, concerns branched OT: equivalence between models, fractal features, stability and phase-field approximations, and quantization of measures. I then developed a second axis on entropy-regularized OT: convergence rates, expansions and selection principles in the small-noise regime. A more recent axis centers on supremal (L^∞) OT and quasi-convex analysis, in search of “dual” potentials for these theories, which amounts to integrating operators with some monotonicity properties.

In parallel, I work on related questions in geometric measure theory and Γ -convergence: variational approximations of droplet models, and Gibbs measures concentrating on Minkowski-rectifiable sets together with the Γ -convergence of the associated relative entropies. I have also worked independently on a kinetic selection principle for the eikonal equation.

Currently, I am pursuing my theoretical work on branched OT (fractality, regularity), while exploring new related directions, namely more general models of network optimization and formation, for urban planning (possibly involving congestion) and biology. I also plan to pursue the supremal OT axis by developing c -quasi-convex analysis, in relation with the construction of dual potentials in supremal OT.

List of papers

In preparation

- [15] A. Chambolle, B. Merlet, and **P. Pegon**. “Minkowski Content and Gibbs Measures”. 2026. In preparation. Working title.

Preprints

- [14] L. De Pascale and **P. Pegon**. *The Quasi-Convex Rockafellar Theorem*. 2026. arXiv: [2610.20542](#)
- [13] L. Nenna, B. Pass, **P. Pegon**, and L. Tocquec. *First-Order Γ -Expansion for Entropic Optimal Transport with Non-Degenerate Costs*. 2026. arXiv: [2610.10257](#)
- [12] L. Nenna, **P. Pegon**, and L. Tocquec. *Convergence Rates for Regularized Unbalanced Optimal Transport: The Discrete Case*. 2025. arXiv: [2507.07917](#)

Peer-reviewed journal articles

- [11] L. De Pascale and **P. Pegon**. “A Rockafellar Theorem for Cyclically Quasi-Monotone Maps: The Regular Non-Vanishing Case”. In: *Communications in Contemporary Mathematics*, 2650071 (2026). Online first. DOI: [10.1142/S0219199726500719](#). arXiv: [2507.09437](#)
- [10] **P. Pegon** and M. Petrache. “Optimal Quantization with Branched Optimal Transport Distances”. In: *SIAM Journal on Mathematical Analysis* 57 (2025), pp. 3649–3694. DOI: [10.1137/24M1650193](#)
- [9] L. Nenna and **P. Pegon**. “Convergence Rate of Entropy-Regularized Multi-Marginal Optimal Transport Costs”. In: *Canadian Journal of Mathematics* 77 (2025), pp. 1072–1092. DOI: [10.4153/S0008414X24000257](#). arXiv: [2307.03023](#)
- [8] A. Monteil and **P. Pegon**. “Mass Concentration in Rescaled First Order Integral Functionals”. In: *Journal de l'École polytechnique — Mathématiques* 11 (2024), pp. 431–472. DOI: [10.5802/jep.257](#). arXiv: [2203.01250](#)
- [7] G. Carlier, **P. Pegon**, and L. Tamanini. “Convergence Rate of General Entropic Optimal Transport Costs”. In: *Calculus of Variations and Partial Differential Equations* 62 (2023), p. 116. DOI: [10.1007/s00526-023-02455-0](#). arXiv: [2206.03347](#)
- [6] M. Colombo, A. De Rosa, A. Marchese, **P. Pegon**, and A. Prouff. “Stability of Optimal Traffic Plans in the Irrigation Problem”. In: *Discrete and Continuous Dynamical Systems* 42 (2022), pp. 1647–1667. DOI: [10.3934/dcds.2021167](#)
- [5] **P. Pegon**, F. Santambrogio, and Q. Xia. “A Fractal Shape Optimization Problem in Branched Transport”. In: *Journal de Mathématiques Pures et Appliquées* 123 (2019), pp. 244–269. DOI: [10.1016/j.matpur.2018.06.007](#)

- [4] P. Bochar d and **P. Pegon**. “Kinetic Selection Principle for Curl-Free Vector Fields of Unit Norm”. In: *Communications in Partial Differential Equations* 42 (2017), pp. 1375–1402. DOI: [10.1080/03605302.2017.1358276](https://doi.org/10.1080/03605302.2017.1358276). arXiv: [1701.02931](https://arxiv.org/abs/1701.02931)
- [3] **P. Pegon**, F. Santambrogio, and D. Piazzoli. “Full Characterization of Optimal Transport Plans for Concave Costs”. In: *Discrete and Continuous Dynamical Systems* 35 (2015), pp. 6113–6132. DOI: [10.3934/dcds.2015.35.6113](https://doi.org/10.3934/dcds.2015.35.6113). arXiv: [1311.3406](https://arxiv.org/abs/1311.3406)
- [2] D. Lesesvre, **P. Pegon**, and F. Santambrogio. “Optimal Transportation with an Oscillation-Type Cost: The One-Dimensional Case”. In: *Set-Valued and Variational Analysis* 21 (2013), pp. 541–556. DOI: [10.1007/s11228-013-0229-4](https://doi.org/10.1007/s11228-013-0229-4). arXiv: [1210.0761](https://arxiv.org/abs/1210.0761)

Book chapter

- [1] **P. Pegon**. “On the Lagrangian Branched Transport Model and the Equivalence with Its Eulerian Formulation”. In: *Topological Optimization and Optimal Transport: In the Applied Sciences*. 2017, pp. 281–303. DOI: [10.1515/9783110430417-012](https://doi.org/10.1515/9783110430417-012)

PhD thesis

- [0] **P. Pegon**. “Branched Transport and Fractal Structures”. PhD thesis. Université Paris-Saclay, 2017

Talks and research visits

Talks

- 11/2026 *GdT Contrôle et Optimisation*, Université de Rouen (upcoming)
- 10/2026 *Séminaire du SAMM*, Université Paris 1 Panthéon-Sorbonne (upcoming)
- 09/2026 Seminar of the ANR project GOTA, Fondation des Treilles
- 07/2026 Mini-symposium *Length optimization, Mathematics Days in Sofia* (Bulgaria)
- 03/2026 Workshop *OT in GMT – GMT in OT*, University of Padova (Italy)
- 03/2026 Session *Calcul des variations, Journées SMAI-MODE 2026*
- 12/2025 *Séminaire Analyse, Phénomènes Stochastiques et Applications*, Université de Brest
- 09/2025 *Seminari di Analisi Matematica*, University of Florence (Italy)
- 06/2025 *AMI Seminar*, University of Alberta (Edmonton, Canada)
- 05/2024 Mini-symposium at *CANUM 2024*, La Rochelle
- 04/2024 *GT Transport Optimal et Optimisation*, Aix-Marseille Université & Université de Toulon
- 03/2024 *Séminaire d'analyse*, École Polytechnique
- 11/2023 *PGMO Days*, Fondation Hadamard, EDF Lab
- 06/2023 *Rencontre du GDR CalVa*, LJLL, Université Paris Cité
- 03/2023 *Analysis and geometry seminar*, PUC Chile (Santiago, Chile)
- 09/2022 *Groupe de travail de transport optimal*, LMO, Université Paris-Saclay (Orsay)
- 01/2022 *SPO seminar (Séminaire parisien d'optimisation)*, IHP (Paris)
- 10/2021 *Analysis & PDE Seminar* (online), Durham University (UK)
- 09/2020 *Séminaire d'analyse et probabilités*, CEREMADE, Université Paris-Dauphine
- 11/2019 *FLACAM conference* (Santiago, Chile), *participation cancelled (2019 protests)*
- 11/2019 *Escapade seminar*, Université Paris-Dauphine
- 10/2018 *CCMA seminar and CAM colloquium*, Penn State University (Pennsylvania, USA)
- 03/2018 *Journées SMAI-MODE 2018* (Autrans)
- 2018 Seminar *EDP, Modélisation et Calcul Scientifique*, ICJ and UMPA (Lyon)
- 2018 Workgroup on calculus of variations *GT CalVa*, Université Paris Diderot
- 04/2017 Workshop *Transport problems in Zürich*, University of Zurich (Switzerland)

Research visits

Nov.–Dec. 2026	1-week stay in Florence (Italy), from 30 November to 5 December, to work with L. De Pascale on L^∞ optimal transport and (generalized) quasi-convex analysis (planned).
September 2025	3-week stay in Florence (Italy) to work with L. De Pascale on the integration of cyclically quasi-monotone operators.
June 2025	2-week stay in Edmonton (Alberta, Canada) hosted by B. Pass, with L. Nenna and our PhD student L. Tocquec, to work on the entropic selection of optimal transport plans for non-degenerate costs (part of the Inria associate team “Karma” between ParMA and PIMS).
March–April 2023	2-week stay in Santiago (Chile) to work with M. Petrache on optimal quantization in branched transport.
January–May 2019	5-month stay at EPFL (Lausanne, Switzerland) to work with M. Colombo on stability and regularity issues in branched and optimal transport; co-supervision of an M1 student (A. Prouff) from ENS Paris-Saclay.
October 2018	1-week stay at Penn State University (USA) to work with A. Bressan on modelling through branched transport and its numerical treatment.

Supervision

PhD students and postdocs

12/2025–present	Scientific co-mentoring of a postdoctoral researcher funded by the ANR project GOTA, with its PI L. Nenna Postdoc: Alessandro Cosenza, Université Paris-Saclay Topic: <i>Dimension estimates for branched transport with an H^{-1} energy</i>
10/2024–present	Co-supervision (50%) of a PhD thesis (main supervisor: L. Nenna), currently in its 3rd year Student: Louis Tocquec, Université Paris-Saclay Topic: <i>ODE characterization of entropic optimal transport</i>

Research internships (M1–M2)

04/2024–09/2024	Co-supervision of an M2 research internship (with L. Nenna) Intern: Louis Tocquec, ENS Paris-Saclay Topic: <i>ODE characterization of entropic optimal transport</i>
09/2023–08/2024	Co-supervision of an M2 research internship (with A. Chambolle) Intern: Lorenzo Braglia, University of Padova Topic: <i>Inner regularity in branched transport</i>
01/2019–05/2019	Co-supervision of an M1 research internship (with M. Colombo) Intern: Antoine Prouff, ENS Paris-Saclay Topic: <i>Stability in branched transport</i>

Research projects

- Member of the ANR JCJC project “Regularity in Geometric Analysis with non-Local Effects (RE-GALE)” (2026–2030, 233 k€), PI: M. Pegon (Université de Lille), with six other members.
- Co-PI, with M. Petrache (PUC Chile), of the French-Chilean ECOS-Sud project “Optimal Transport Innovations for Multidisciplinary Applications (OPTIMA)” (2026–2028, ~15 k€). The project brings together seven senior and two junior researchers based in Santiago and Concepción (Chile), Paris and Toulon (France), on branched optimal transport, urban planning, multi-marginal optimal transport, quantization of measures, and optimal transport methods for diffusion models in deep learning.

- Member of the ANR JCJC project “Elliptic systems with sharp transition on optimal sets (ES-STOS)” (2025–present), PI: A. Monteil (Université Paris-Est Créteil), with three other members.
- Member of the Inria associate team “Karma” between ParMA (Inria Saclay) and the Kantorovich Initiative (PIMS & University of Alberta, Canada) (2024–2026), PIs: T. Gallouët (Inria Saclay) and B. Pass (University of Alberta).
- Member of the ANR JCJC project “Generalized Optimal Transport and Applications (GOTA)” (2023–present, 250 k€), PI: L. Nenna (Université Paris-Saclay), with M. Laborde (Université Paris Cité).
- Recipient, with M. Petrache (PUC Chile), of a “Young Researcher” grant of the Scientific Council of Université Paris-Dauphine for the project “Optimal Quantization via Branched Transport” (2023, 4,800 €).
- Member of the PEPS project “Branched transport and network formation in biology” (2021–2022), PI: R. Hug (Aix-Marseille Université), with A. Monteil (Université Paris-Est Créteil).

3. Teaching

Teaching experience

2018–PRESENT	MCF, <i>Université Paris-Dauphine</i>
2017–2018	ATER (full-time, 192h), <i>Université Paris-Sud</i>
2014–2017	Teaching assistant during PhD (“monitorat”, 64h per year), <i>Université Paris-Sud</i>
2013–2014	Oral examiner in preparatory classes (MPSI), <i>Lycée Janson de Sailly</i>

I have been teaching mathematics at Université Paris-Dauphine in the MIDO department (mathematics and computer science) since 2018. My teaching includes exercise sessions, combined lectures and exercise sessions and full lectures, from undergraduate (L1) to graduate (M1) level. From 2024 to 2026, I was co-director of the *Master 1 Mathematics and Applications* program with a colleague. Before joining Dauphine, I taught at Université Paris-Sud for four years: three years as a PhD teaching assistant (“moniteur”), then one year as a full-time ATER.

Teaching load

2026–2027	192h (planned)
2025–2026	192h
2024–2025	96h (CRCT research leave)
2023–2024	192h
2022–2023	0h (Inria delegation)

Courses taught at Dauphine (MIDO)

Summary by course, with course titles in the language of instruction (detailed year-by-year record in Appendix A).

Course	Level	Format	Hours $\times$ years
<i>Calculus of variations</i>	M1	Coord., lect. & ex.	56h $\times$ 1 [†]
<i>Advanced convex analysis</i> (materials)	M1	Coord., lect. & ex.	56h $\times$ 2
<i>Analyse 1</i>	L1	Coord., lect. & ex.	111h $\times$ 1
<i>Analyse 2</i>	L1	Ex.	51h $\times$ 3
<i>Analyse 3</i>	L2	Ex.	51h $\times$ 2
<i>Analyse 4</i>	L2	Ex.	51h $\times$ 2*
<i>Intégrale de Lebesgue et probabilités</i>	L3	Ex.	44h $\times$ 4
<i>Méthodes numériques : optimisation</i>	L3	Ex. & computer labs	32h $\times$ 1
<i>Analyse fonctionnelle et hilbertienne</i>	L3	Ex.	44h $\times$ 2*
<i>Analyse fonctionnelle et EDP</i>	M1	Ex.	22h $\times$ 1
<i>Pré-rentrée : mise à niveau en analyse</i> (materials)	M1	Integrated	16h $\times$ 3

Coord.: course coordinator; Integrated: combined lectures and exercise sessions; Lect.: lectures; Ex.: exercise sessions.

[†] 2026–2027 (planned); * including 2026–2027 (planned).

Supervision of student theses and internships (L3, M1)

2026–2027	Supervision of an M1 thesis (planned) Topic: <i>From Steiner trees to branched optimal transport</i>
2026–2027	Supervision of an L3 thesis (planned) Topic: <i>Around the Kakeya problem</i>
2025–2026	Supervision of an L3 group thesis (second semester) Students: Ayda Atmani, Oceane Arabi, Arris-Ali Bouzouane Topic: <i>An introduction to optimal transport</i>
01/2024–06/2024	Co-supervision of an L3 research internship Intern: Enzo Regna Guarneri Topic: <i>Fractal properties of Weierstrass-type functions</i>

Teaching responsibilities

From September 2024 to August 2026, I was **co-director of the *Master 1 Mathematics and Applications*** program (approximately 120 students) with a colleague. My responsibilities included student supervision, ensuring the smooth operation of the various courses, organizing M1 presentation meetings, preparing end-of-year juries, managing the recruitment process via “MonMaster”, organizing the “M1 Thesis” course, contributing to administrative tasks, and taking part in the design of the M1 reform implemented in 2026. I was also responsible for the *Advanced convex analysis* course (M1) from 2024 to 2026, and I am responsible for the new *Calculus of variations* course (M1) since 2026–2027.

In 2023–2024, I was responsible for the *Analyse 1* course, the first undergraduate analysis course common to the entire L1 cohort (approximately 180 students). My duties included maintaining course materials, planning the curriculum for lectures and exercise sessions, and coordinating the various groups (7 combined lecture and exercise-session groups).

4. Collective responsibilities

Service to the scientific community

Organization of events and seminars

- Co-organizer of the [MOKA10](#) workshop for the 10th anniversary of MOKAPLAN (June 2024).
- Co-organizer of the workgroup on Calculus of Variations [GT CalVa](#) (common to Université Paris-Dauphine, Université Paris Cité and Université Paris-Saclay) from September 2020 to August 2023, including several start-of-year and end-of-year workshops.
- Co-organizer of the GT CalVa at Université Paris-Sud from 2016 to 2018.
- Co-organizer of the two-day workshop *Working day on branched transport* (Université Paris-Sud, 2016), where I gave an introductory mini-course on branched transport.

Refereeing

- Reviewer for *Asymptotic Analysis*, *Calculus of Variations and PDE*, *Communications in Contemporary Mathematics*, *ESAIM: Control, Optimisation and Calculus of Variations*, *ESAIM: Mathematical Modelling and Numerical Analysis*, *Journal of Convex Analysis*, *Journal of Mathematical Analysis and Applications*, *SIAM Journal on Mathematical Analysis*.

Recruitment committees and PhD juries

- Member of a recruitment committee for an associate professor (MCF) position in analysis at Université Paris-Dauphine in April–May 2026.
- Member of a recruitment committee for an associate professor (MCF) position in mathematics at Université Paris 1 Panthéon-Sorbonne in 2025.
- Member of a recruitment committee for an associate professor (MCF) position in mathematics at Université de Toulon in 2024.
- Member of the PhD defense committee of A. Cosenza (supervisor: M. Goldman, Université Paris Cité) in November 2025.

University governance and staff representation

- Elected member of the Board of Directors (*Conseil d'administration*) of Université Paris-Dauphine since November 2024, and member of its Finance Committee.
- Elected member of the Scientific Council of Université Paris-Dauphine from February to October 2024.
- Staff representative on the Health, Safety and Working Conditions Committee (CHSCT) of Université Paris-Dauphine from December 2020 to December 2022.

A. Detailed teaching record (Université Paris-Dauphine)

FI: initial training; MIE: mathematics, computer science, economics (L1–L2); MEFA: mathematics, economics, finance, actuarial science (L3); MAP: mathematics and applications (M1). Lect.: lectures; Ex.: exercise sessions; Lab: computer labs; Resp.: responsibility. Course titles are given in the language of instruction.

Year	Level	Program	Course / activity	Type	Nature	Students	Hours
26–27	M1	MAP	Calculus of variations (planned)	FI	Lect., Ex.	30	56
26–27	L2	MIE	Analyse 4 (planned, 2nd semester)	FI	Ex.	30	51
26–27	L3	MEFA	Analyse fonctionnelle et hilbertienne (planned, 2nd semester)	FI	Ex.	30	44
26–27	M1	MAP	M1 thesis supervision (planned)	FI	Supervision	–	7.8
26–27	L3	MEFA	L3 thesis supervision (planned)	FI	Supervision	–	4
25–26	M1	MAP	Advanced convex analysis	FI	Lect., Ex.	40	56
25–26	M1	MAP	Co-direction of the M1 program	FI	Resp.	100	25
25–26	M1	MAP	Coordination of M1 theses (MAPPRO)	FI	Resp.	25	10
25–26	L3	MEFA	L3 group thesis supervision	FI	Supervision	3	4
24–25	M1	MAP	Advanced convex analysis	FI	Lect., Ex.	40	56
24–25	M1	MAP	Co-direction of the M1 program	FI	Resp.	100	25
24–25	M1	MAP	Coordination of M1 theses (MAPPRO)	FI	Resp.	25	10
23–24	L1	MIE	Analyse 1	FI	Lect., Ex.	30	111
23–24	L1	MIE	Coordination of Analyse 1	FI	Resp.	30	35
23–24	L2	MIE	Analyse 4	FI	Ex.	30	51
23–24	L3	MEFA	Research internship supervision	FI	Supervision	1	4
21–22	L1	MIE	Analyse 2	FI	Ex.	30	51
21–22	L3	MEFA	Intégrale de Lebesgue et probabilités	FI	Ex.	30	44
21–22	L3	MEFA	Analyse fonctionnelle et hilbertienne	FI	Ex.	30	44
21–22	L3	MEFA	Méthodes numériques : optimisation	FI	Ex., Lab	30	32
20–21	L1	MIE	Analyse 2	FI	Ex.	30	51
20–21	L2	MIE	Analyse 3	FI	Ex.	30	51
20–21	L3	MEFA	Intégrale de Lebesgue et probabilités	FI	Ex.	30	44
20–21	L3	MEFA	Preparation for competitive exams	FI	Oral exams	4	2
20–21	M1	MAP	Pré-rentree : mise à niveau en analyse	FI	Lect., Ex.	80	16
19–20	L1	MIE	Analyse 2	FI	Ex.	30	51
19–20	L2	MIE	Analyse 3	FI	Ex.	30	51
19–20	L3	MEFA	Intégrale de Lebesgue et probabilités	FI	Ex.	30	44
19–20	M1	MAP	Pré-rentree : mise à niveau en analyse	FI	Lect., Ex.	80	16
18–19	L3	MEFA	Intégrale de Lebesgue et probabilités	FI	Ex.	30	44
18–19	M1	MAP	Pré-rentree : mise à niveau en analyse	FI	Lect., Ex.	80	16
18–19	M1	MAP	Analyse fonctionnelle et EDP	FI	Ex.	30	22