

# Jaume de Dios Pont

## Curriculum Vitae

60 5th Avenue  
New York, NY 10011  
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## Employment

- 2025 – **NYU Center for Data Science**, *CDS Faculty Fellow*.
- 2023 – **ETH Zurich**, *Postdoctoral Researcher*, Mentor: Svitlana Mayboroda. Simons Collaboration on Localization of Waves.
- May '23 – **Microsoft Research**, *Research Intern*, Physics of AGI group. Mentors: Jerry Li; Adil Salim.  
Sep '23
- 2020 – **UCLA**, *Teaching Assistant*.  
2022

## Education

- 2023 **PhD Mathematics**, *UCLA*.  
Part I: Uniform Estimates for Operators Involving Polynomial Curves. Part II: Decoupling Estimates for Fractal and Product Sets. Supervised by T. Tao
- 2018 **MSc Mathematics**, *ETH Zurich*, (Grade: 5.76/6).  
Thesis: Quantum Loewner Evolution (E. Powell and W. Werner)
- 2017 **BSc Mathematics**, *Universitat Autònoma de Barcelona*, (#1 Rank, Grade: 9.71/10).  
Thesis: Oscillatory integrals and the Kakeya Conjecture (J. Garnett; J. Verdera)
- 2017 **BSc Physics**, *Universitat Autònoma de Barcelona*, (#1 Rank, Grade: 9.62/10).  
Thesis: KCM-related experiments (F.X. Alvarez; A. Lopeandia)

## Postgraduate Awards and Scholarships

- 2022-2023 **Dissertation Year Fellowship**, *UCLA*.  
Tuition and stipend for final year
- 2018-2020 **La Caixa Postgraduate Fellowship**, *Fundació La Caixa*.  
Full tuition and stipend. Highest score.
- 2017-2018 **Excellence Scholarship**, *ETH Zurich*.  
Tuition; living costs; mentorship

## Papers and Preprints

- [1] **Sharp bounds on the failure of the hot spots conjecture**, *de Dios Pont, J., Alexander W. Hsu & Mitchell A. Taylor*, Preprint (2025), [arXiv:2508.16321](https://arxiv.org/abs/2508.16321).
- [2] **Convex sets can have interior hot spots**, *de Dios Pont, J.*, Preprint (2024), [arXiv:2412.06344](https://arxiv.org/abs/2412.06344).
- [3] **Predicting quantum channels over general product distributions**, *Sitan Chen, de Dios Pont, J., Jun-Ting Hsieh, Hsin-Yuan Huang, Jane Lange & Jerry Li*, Preprint (2024), [arXiv:2409.03684](https://arxiv.org/abs/2409.03684).
- [4] **Periodicity and decidability of translational tilings by rational polygonal sets**, *de Dios Pont, J., Jan Grebik, Rachel Greenfeld & Jose Madrid*, *Expositiones Mathematicae*, [arXiv:2408.02151](https://arxiv.org/abs/2408.02151).

- [5] **A new proof of the convex hull of space curves with totally positive torsion**, *de Dios Pont, J.*, Paata Ivanisvili & Jose Madrid, Michigan Mathematical Journal, arXiv:2201.12932.
- [6] **Query lower bounds for log-concave sampling**, *Sinho Chewi, de Dios Pont, J.*, Jerry Li, Chen Lu & Shyam Narayanan, JACM Vol.71 Issue 4 / FOCS 2023, arXiv:2304.02599.
- [7] **Uniform Fourier Restriction Estimate for Simple Curves of Bounded Frequency**, *de Dios Pont, J.* & Helge Jorgen Samuelsen, Preprint (2023), arXiv:2303.11693.
- [8] **Additive energies on discrete cubes**, *de Dios Pont, J.*, Rachel Greenfeld, Paata Ivanisvili & Jose Madrid, Discrete Analysis, arXiv:2112.09352.
- [9] **Decoupling for fractal subsets of the parabola**, *Alan Chang, de Dios Pont, J.*, Rachel Greenfeld, Asgar Jamneshan, Zane Kun Li & Jose Madrid, Mathematische Zeitschrift, arXiv:2012.11458.
- [10] **Role Detection in Bicycle-Sharing Networks Using Multilayer Stochastic Block Models**, *Jane Carlen, de Dios Pont, J.*, Cassidy Mentus, Shyr-Shea Chang, Stephanie Wang & Mason A. Porter, Network Science, arXiv:1908.09440.
- [11] **On classical inequalities for autocorrelations and autoconvolutions**, *de Dios Pont, J.* & Jose Madrid, Preprint (2021), arXiv:2106.13873.
- [12] **On Sparsity in Overparametrised Shallow ReLU Networks**, *Joan Bruna & de Dios Pont, J.*, Preprint (2020), arXiv:2006.10225.
- [13] **A geometric lemma for complex polynomial curves in Fourier restriction theory**, *de Dios Pont, J.*, Preprint (2020), arXiv:2003.14140.

## Talks

### Research talks

#### Spectral theory and the hot spots conjecture

- 2026 Simons Collaboration on Localization of Waves Annual Meeting (Feb '26)
- NYU CDS MaD Seminar (Feb '26)
- Joint Mathematics Meetings 2026 (Washington, D.C.) (Jan '26)
- Instituto de Ciencias Matemáticas (ICMAT) Seminar (Sep '25)
- ISM Discovery School — Interactions between Convex Geometry and Spectral Analysis (Montreal) (Jul '25)
- UK Spectral Theory Network Workshop (University of Reading) (Aug '25)
- Workshop on Spectral Geometry, PDEs and Mathematical Physics (FernUni Hagen) (Jul '25)
- Fourier Analysis and Beyond I (IMPA, Rio de Janeiro) (Jul '25)
- ETHZ Analysis Seminar (hosted by Yuansi Chen) (May '25)
- LSEC Seminar (Apr '25)
- University of Edinburgh Analysis Seminar (Mar '25)
- Lehigh University Mathematics Seminar (Mar '25)
- Institut Camille Jordan Analysis Seminar (Lyon) (Mar '25)
- Spectral Geometry in the Clouds (Mar '25)
- MPS Workshop on Computation in Mathematics (Flatiron Institute) (Feb '25)
- Simons Collaboration on Localization of Waves Annual Meeting — Poster Session (Flatiron Institute) (Feb '25)
- Virginia Tech Analysis Seminar (Feb '25)
- Seminari d'Anàlisi UB-UAB (Jan '25)
- ETHZ Analysis Seminar (Oct '24)
- Hausdorff Center for Mathematics Colloquium (Bonn) (Oct '24)
- 2024 Simons Collaboration on Localization of Waves Meeting (Oct '24)

#### Lower bounds for sampling

- CRM — Mathematical Foundations of Machine Learning (Barcelona) (Jan '26)
- Hausdorff Research Institute for Mathematics — Boolean Analysis in Computer Science (HIM, Bonn) (Oct '24)
- BIRS-IMAG Workshop (Granada) (Jun '24)
- UCLA Analysis Seminar (May '24)
- Hausdorff Research Institute for Mathematics — Synergies between Probability, Geometric Analysis and Stochastic Geometry (HIM, Bonn) (Jan '24)
- University of Rochester Computer Science Seminar (May '23)
- NYU Courant Analysis Seminar (Mar '23)
- Microsoft Research Theory Seminar (Dec '22)
- NYU MaD Group Meeting (Dec '22)

#### Uniformity for polynomial curves

- Rutgers University Analysis Seminar (Oct '23)
- University of Rochester Combinatorics Seminar (May '23)
- University of Minnesota PDE Seminar (Sep '22)
- Bilbao Analysis and PDE Seminar (BCAM) (Mar '22)
- UAB Analysis Seminar (Universitat Autònoma de Barcelona) (Mar '22)
- UK Virtual Harmonic Analysis Seminar (Fourier 2.0) (Oct '21)

### Decoupling for Cantor sets

- Harmonic Analysis and Fractal Sets Conference (HAFS, Columbus OH) (Mar '23)
- Fourier Restriction Online 2021 (Mar '21)

### Uniform boundedness for certain operators parametrized by polynomial curves

- UW Madison Analysis Seminar (Nov '22)
- Harmonic Analysis on Manifolds Summer School (UW Madison) (Aug '22)
- ETHZ Analysis Seminar (Mar '22)
- Probability and Analysis Webinar (PAW) (Aug '21)
- UC Davis Student-Run Analysis and PDE Seminar (Feb '21)
- Seminari d'Anàlisi UB-UAB (Nov '20)
- Online Analysis Research Seminar (OARS) (Dec '20)

### A Function Space Perspective for Regularised and Overparametrised Shallow ReLU Networks

- NYU, MaD Group Meeting (Oct '20)

### TBD

- Brown University (May '26)
- SMS Spring Meeting: Formalization and Proof Assistants (Brig) (Mar '26)
- COST mSPACE Kick-off Meeting (Milan) (Mar '26)

### Expository talks

- **Generació de variables aleatòries**, Valentia Matemàtica (Jun '25)
- **Power-type cancellation for the simplex Hilbert transform**, Kopp Summer School Reading Group (Bonn) (Sep '23)
- **Decoupling: From partial differential equations to number theory**, Microsoft Research Theory Seminar (Jul '23)
- **Localization of eigenfunctions via an effective potential**, Kopp Summer School Reading Group (Bonn) (Oct '22)
- **On Rank Vs. Communication Complexity**, AIM Workshop: Analysis on the Hypercube with Applications to Quantum Computing (Jun '22)
- **Euclidean Forward-Reverse Brascamp-Lieb Inequalities**, Brascamp-Lieb Summer School Reading Group (Kopp, Germany) (Sep '21)
- **A proof of the sensitivity conjecture**, UCLA Participating Analysis Seminar (Reading Group) (Nov '21)
- **Decoupling and applications: from PDEs to Number Theory**, SIMBa Seminar (UB / BGSMATH) (Oct '20)

*Talks are grouped by topic, even when the covered material changed between instances.*

## Research Visits (> 1 week)

- Jul '25 **New York, Flatiron Institute.**
- Oct '24 **Hausdorff Institute of Mathematics, Bonn**, *Boolean Analysis in Computer Science.*
- Jan '24 **Hausdorff Institute of Mathematics, Bonn**, *Dual Trimester Program: Synergies between modern probability, geometric analysis and stochastic geometry.*
- Oct '23 – **Hausdorff Institute of Mathematics, Bonn**, *NTNU visit.*  
Nov '23
- May '23 – **Seattle, WA**, *Microsoft Research Internship.*  
Sep '23
- Oct '22 **Palo Alto, California**, *Stanford University.*
- Sep '22 **UMN, Minneapolis**, *University of Minneapolis.*
- Jun '22 – **ICMS, Edinburgh**, *Fourier Analysis @200.*  
Jul '22

- Jan '22 – **Hausdorff Institute of Mathematics, Bonn**, *Interactions between Geometric measure theory, Singular integrals, and PDE.*
- Mar '22
- Aug '21 **Hausdorff Mathematical Institute, Bonn**, *Harmonic Analysis and Analytic Number Theory, Dual trimester program.*
- May '21 – **Hausdorff Mathematical Institute, Bonn**, *Harmonic Analysis and Analytic Number Theory, Dual trimester program.*
- Jun '21
- Feb '26 – **Cambridge, UK**, *Isaac Newton Institute - Geometric Spectral theory and Applications.*
- Mar '26

## Teaching Experience

### ETH Zurich (Main Instructor)

- Formalizing Mathematics in Lean Spring 2025

### ETH Zurich (Teaching Assistant)

- Differential Geometry Spring 2024

### UCLA (Teaching Assistant)

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|---------------------------|------------------------|------------------------------|------------------------|
| Math 131A (Real Analysis) | Fall 2020; Spring 2022 | Math 33B (Linear Algebra II) | Spring 2021            |
| Math 134 (ODE I)          | Fall 2021              | Math 32A (Calculus I)        | Fall 2020; Winter 2021 |
| Math 135 (ODE II / PDE)   | Fall 2021              | Math 32B (Calculus II)       | Winter 2021            |

## Reviewing

Reviewer for: Transactions of the AMS, Proceedings of the AMS, Mathematical Statistics and Learning, Discrete Mathematics, Journal of the London Mathematical Society, AMS Contemporary Mathematics.

## Misc. Coding Skills

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| Proficient in Python<br>(incl. Jax, NumPy/SciPy/Matplotlib) | Git/Version Control<br>L <sup>A</sup> T <sub>E</sub> X |
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## Undergraduate Research Experience

- 2017 **GNAM**, *Grup de Nanomaterials, UAB.*  
Research on heat conduction beyond the Fourier equations at the nanoscale, with a focus on the KCM diffusion model.
- 2016 **ICFO**, *Summer Fellowship of the Institute of Photonic Sciences.*  
Research fellow in the group of Antonio Acín (Quantum Information). Proved impossibility results on the creation of superpositions of unknown quantum states. Supervisor: Dr. Michał Oszmaniec.
- 2015 **The Dark Energy Survey Project**, *IFAE – Institute for High Energy Physics.*  
Study of theoretical models regarding the harmonic spectrum of galaxy density distributions. Supervisor: Dr. Ramon Miquel.