

Richard Medina Rodríguez

Curriculum Vitae

CEREMADE, Université Paris Dauphine - PSL
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Education and Academic Positions

- Sept. 2025 - present **Teaching and Research Fellow**, Université Paris Dauphine - PSL, France.
Research on kinetic theory; teaching assistant for mathematics courses (real analysis and numerical methods).
- 2022 - 2025 **PhD in Applied Mathematics**, Université Paris Dauphine - PSL, France.
Thesis title: Hypocoercivity and geometric confinement.
PhD Advisors: Kleber Carrapatoso & Stéphane Mischler.
Defense date: 18 December 2025.
Jury: Véronique BAGLAND, Émeric BOUIN, José A. CAÑIZO, Arnaud GUILLIN, Frédéric HÉRAU.
- 2022 **Master Internship**, CEREMADE, Université Paris Dauphine - PSL, France.
Advisors: Kleber Carrapatoso & Stéphane Mischler.
Research Project: Extending hypocoercivity techniques for linearized kinetic equations to non-smooth bounded domains.
- 2021 - 2022 **Master of Science in Applied and Theoretical Mathematics**, Université Paris Dauphine - PSL, France.
With Honors (Mention Bien).
- 2020 - 2021 **Assistant Professor**, *Department of Mathematics*, Universidad de La Habana, Cuba.
Research on functional analysis and PDEs; teaching assistant for mathematics courses (real and complex analysis).
- 2016 - 2020 **Bachelor of Science in Mathematics**, Universidad de La Habana, Cuba.
Summa Cum Laude.
Bachelor's Final Project: Random Schrödinger operators in a 2D scheme.
Advisors: Rita Roldán Inguanzo & Laure Dumaz.

Long-term Research Stays

- Oct. - Nov. 2024 **Warwick Mathematics Institute**, University of Warwick, United Kingdom.
Work in collaboration with Josephine Evans on the effects of interior and boundary thermostats on the long-time behavior of non-linear kinetic Fokker-Planck equations.

Publications

Submitted

- 2025 **R. Medina**, The Boltzmann equation on smooth and cylindrical domains with Maxwell boundary conditions, URL <https://arxiv.org/abs/2510.13260>.
Submitted to *Kinetic and Related Models*.
- 2025 **J. Evans and R. Medina**, Existence and stability of non-equilibrium steady states of a weakly non-linear Kinetic Fokker-Planck equation in a domain, URL <https://arxiv.org/abs/2506.03632>.
Submitted to the *Journal of Statistical Physics*.

- 2024 **K. Carrapatoso, P. Gabriel, R. Medina, and S. Mischler**, Constructive Krein-Rutman result for Kinetic Fokker-Planck equations in a domain, URL <https://arxiv.org/abs/2407.10530>.
Submitted to *Analysis & PDE*.

Invited Talks

Invited Talks at Conferences and Workshops

- Jun. 2024 ***The Boltzmann equation in a cylinder near the hydrodynamic limit***, presented at the conference *Analysis of PDEs in Mathematical Physics*, University of Bath, United Kingdom.
- Feb. 2023 ***'Cause I'll L-ove you to-infinity estimates for the Boltzmann equation***, presented at the *MAFRAN Days*, King's College, United Kingdom.
- Jun. 2019 ***Fixed points in non-expansive maps***, presented at the *International Congress COM-PUMAT 2019*, Universidad de La Habana, Cuba.
- Mar. 2019 ***Extrapolation Methods for Approximating a Fairness Functional***, presented at the *International Workshop on Operations Research (IWOR)*, Universidad de La Habana, Cuba.
- Mar. 2018 ***Restriction-based interpolation with cubic A-splines***, presented at the *International Conference on Operations Research (ICOR)*, Universidad de La Habana, Cuba.

Invited Talks at Seminars

- Feb. 2026 ***The Boltzmann equation with non-isothermal Maxwell boundary conditions***, presented at the *SPIKE Seminar*, Institut Henri Poincaré (IHP), France.
- Jan. 2025 ***Brief introduction to the Boltzmann equation***, presented at the *Young Researchers Seminar*, Université Paris Dauphine - PSL, France.
- Nov. 2024 ***Constructive Krein-Rutman result for kinetic Fokker-Planck equations in a domain (joint work with P. Gabriel, K. Carrapatoso and S. Mischler)***, presented at the *Junior Analysis Seminar*, Imperial College London, United Kingdom.
- Oct. 2024 ***The Boltzmann equation on C^1 and cylindrical domains near the hydrodynamic limit***, presented at the *Partial Differential Equations and their Applications Seminar*, University of Warwick, United Kingdom.
- Nov. 2023 ***Introduction to the kinetic Fokker-Planck equation and its long-time behavior***, presented at the *Young Researchers Seminar*, Université Paris Dauphine - PSL, France.
- May 2023 ***Hypocoercivity estimates for some linearized kinetic operators***, presented at the *Young Researchers Seminar*, Université de Lille, France.
- Mar. 2023 ***Hypocoercivity estimates for some linearized kinetic operators***, presented at the *Young Researchers Seminar*, Université Paris Dauphine - PSL, France.

Poster Presentations

- Jul. 2024 ***Constructive Krein-Rutman result for kinetic Fokker-Planck equations in a domain (joint work with P. Gabriel, K. Carrapatoso and S. Mischler)***, presented at the summer school *Collective behavior and Pattern formation*, CIRM, France.
- Jun. 2024 ***Constructive Krein-Rutman result for kinetic Fokker-Planck equations in a domain (joint work with P. Gabriel, K. Carrapatoso and S. Mischler)***, presented at the summer school *Frontiers in Interacting Particle Systems, Aggregation-Diffusion Equations & Collective Behavior*, CIRM, France.

Participation on Conferences, Workshops and Schools

- Jul. 2024 ***Summer school on Collective Behavior and Pattern Formation***, CIRM, France.

- Jun. 2024 **Research school on Frontiers in Interacting Particle Systems Aggregation-Diffusion Equations & Collective Behavior**, CIRM, France.
- Nov. 2022 **Research School on Kinetic Theory**, CIRM, France.
- Jul. 2022 **Conference on When Kinetic Theory Meets Fluid Mechanics**, FIM - Institute for Mathematical Research, ETH Zürich, Switzerland.
- Jun. 2019 **CIMPA Research Summer School on Mathematical Models in Biology and Related Applications of Partial Differential Equations**, Universidad de La Habana, Cuba.
- Mar. 2019 **III Winter School in Computer Science on Selected Topics in Probability and Statistics**, Universidad de La Habana, Cuba.

Awards, Fellowships & Grants

- 2022 **MathInParis2020 COFUND Fellowship** — PhD grant awarded by the Fondation de Sciences Mathématiques de Paris (FSMP).
- 2021 **PSL PhD Track Grant 2021** — Master's Excellence Scholarship awarded by the Université Paris Sciences et Lettres.
- 2020 **Prize for Scientific Merit** awarded by the Universidad de La Habana for outstanding scientific work during the Bachelor's studies.

Organization of Seminars and Conferences

- Jun. 2024 Co-organizer of the **Young Researchers Days** conference, held at *Domaine de la Tour*, Saint-Pierre-Canivet, France. Three-day conference for PhD students to present and discuss their research. Supported by the Dauphine Doctoral School.
- 2023 – 2024 Co-organizer of the **Young Researchers Seminar** at the Université Paris Dauphine - PSL.

Teaching Experience

- Spring 2026 **Algebra 4 & Numerical methods**, *problem-solving sessions for second-year Mathematics students*, Université Paris Dauphine - PSL, France.
- Fall 2025 **Analysis 1**, *lectures and problem-solving sessions for first-year Mathematics students*, Université Paris Dauphine - PSL, France.
- May 2025 **Functional Analysis Summer School**, *problem-solving sessions for graduate Mathematics students*, Universidad de La Habana, Cuba.
- Spring 2025 **Analysis 2**, *problem-solving sessions for first-year Mathematics students*, Université Paris Dauphine - PSL, France.
- Spring 2024 **Analysis 2**, *problem-solving sessions for first-year Mathematics students*, Université Paris Dauphine - PSL, France.
- Fall 2023 **Mathematical Methods**, *lectures and problem-solving sessions for first-year Economics students*, Université Paris Dauphine - PSL, France.
- Spring 2021 **Complex Analysis**, *problem-solving sessions for third-year Mathematics students*, Universidad de La Habana, Cuba.
- Fall 2020 **Introduction to Mathematics**, *lectures and problem-solving sessions for first-year Mathematics students*, Universidad de La Habana, Cuba.
- 2017 – 2019 **Tutorship**, *assisting in problem-solving sessions for Mathematics students*, Universidad de La Habana, Cuba.
Subjects: Topology, Analysis 4 (series and Fourier analysis), Analysis 3 (analysis of functions of several variables), Analysis 2 (analysis of functions of one variable), and Introduction to Mathematics.

Outreach

- May 2024 Volunteer Stand Animator at the **Salon de Culture et Jeux Mathématiques** at Place Saint-Sulpice, Paris, France.
- March 2024 Volunteer judge at the **Math en Jeans 2024 Congress** at Université Paris Dauphine - PSL, Paris, France.
- 2016 – 2019 Instructor for high-school students in an advanced mathematics program, preparing them for the Cuban National Mathematics Competitions, La Habana, Cuba.

Editorial Service

Referee for international journals (*Communications in Mathematical Physics*).

Competitions

- 2019 **Ibero-American University Mathematics Olympiad** - Silver medal.
- 2018 **Ibero-American University Mathematics Olympiad** - Bronze medal.
- 2017 **Raimundo Reguera National University Mathematics Olympiad** - Silver medal.
- 2017 **Ibero-American University Mathematics Olympiad** - Honorable Mention.
- 2016 **Raimundo Reguera National University Mathematics Olympiad** - Honorable Mention.
- 2015 **Cuban National High School Mathematics Olympiad** - Gold medal (ranked 3rd).
- 2014 **Cuban National High School Mathematics Olympiad** - Silver medal.

Computer Skills

- Programming Languages PYTHON (advanced), C# (intermediate), HTML (intermediate).
- Scientific software WOLFRAM MATHEMATICA (advanced), Matlab (intermediate).
- Typesetting & visualization L^AT_EX (advanced), TikZ/Beamer (advanced).

Languages

- Spanish Native speaker.
- English Bilingual proficiency, TOEIC C1 (June 2022).
- French Bilingual proficiency.

Referees

Prof. Stéphane Mischler

CEREMADE, Université Paris Dauphine - PSL;
& Institut Universitaire de France (IUF).

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Prof. Kleber Carrapatoso

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Prof. Josephine Evans

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University of Warwick.

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Prof. Pierre Gabriel

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Université de Tours

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