

# Renato Velozo Ruiz

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## EMPLOYMENT

- 2025–2026 **Research Associate** in Department of Mathematics at Imperial College London (UK).  
2023–2025 **Postdoctoral Fellow** in Department of Mathematics at University of Toronto (Canada).  
2022–2023 **Postdoctoral Fellow** in Laboratoire Jacques-Louis Lions at Sorbonne Université (France).

## EDUCATION

- 2018–2023 **PhD in Mathematics** at University of Cambridge (UK).

Supervisors: Mihalis Dafermos and Clément Mouhot.

Thesis: Linear and non-linear collisionless many-particle systems.

- 2017–2018 **Master of Science in Mathematics** at Pontificia Universidad Católica de Chile.

- 2013–2016 **Bachelor in Mathematics** at Pontificia Universidad Católica de Chile.

## RESEARCH INTERESTS

Analysis of PDEs. Mathematical Physics. General Relativity. Kinetic Theory.

## SCIENTIFIC WORK

Non-linear stability of Schwarzschild spacetime for the spherically symmetric Einstein–massless Vlasov system; in preparation.

Phase mixing and the Vlasov equation in cosmology, joint with M. Taylor; arXiv:2512.04214 preprint.

Relatively non-degenerate integrated decay estimates for massless Vlasov fields on Schwarzschild spacetimes, joint with L. Bigorgne; arXiv:2501.09730 preprint.

Decay properties for massive Vlasov fields on Schwarzschild spacetimes; arXiv:2411.05124 preprint.

Late-time asymptotics of small data solutions for the Vlasov–Poisson system, joint with L. Bigorgne; arXiv:2404.05812 preprint.

A note on integrated local energy decay estimates for spherically symmetric black hole spacetimes, joint with G. Holzegel and G. Mavrogiannis; arXiv:2403.02533 preprint.

Decay properties of Vlasov fields on non-trapping asymptotically hyperbolic manifolds, joint with A. Velozo Ruiz; arXiv:2312.13496 preprint.

Modified scattering of small data solutions for the Vlasov–Poisson system with a repulsive potential, joint with L. Bigorgne and A. Velozo Ruiz; SIAM Journal on Mathematical Analysis, 57(1):714–752, 2025.

Small data solutions for the Vlasov–Poisson system with a repulsive potential, joint with A. Velozo Ruiz; *Commun. Math. Phys.* 405, 80 (2024).

Gevrey regularity for the Vlasov–Poisson system; *Ann. Inst. H. Poincaré Anal. Non Linéaire* 38 (2021), no. 4, 1145–1165.

Characterization of uniform hyperbolicity for fibre-bunched cocycles; *Dyn. Syst.* 35 (2020), no. 1, 124–139.

## ACADEMIC VISITS

March 2026, ETH Zürich, Department of Mathematics, invited by Mikaela Iacobelli.

May–July 2025, Universidad de Chile, Mathematical Engineering Department, invited by Claudio Muñoz and Hanne Van Den Bosch (one month a half).

April 2025, University of California San Diego, Department of Mathematics, invited by Davide Parise (one week).

July 2024 and November 2024, Imperial College London, Department of Mathematics, invited by Martin Taylor (one week each time).

November 2019 and March 2022, Princeton University, Department of Mathematics, invited by Mihalis Dafermos (a month each time).

January 2022 and January 2025, Pontificia Universidad Católica de Chile, Department of Mathematics, invited by Mariel Sáez and Anibal Velozo Ruiz, respectively (a month each time).

## CONFERENCE TALKS

January 2026, 2nd Münster–Imperial Day in PDE, Universität Münster.

January 2026, Segunda Jornada Anual de Nuevos Edepistas, Mathematical Engineering Department–Center for Mathematical Modeling, Universidad de Chile.

January 2026, Conference ‘Recent Progress in Asymptotic Stability of Solitons and Related Problems’, Punta Arenas, Chile.

November 2024, Workshop in Dynamical Systems and Related Topics, Penn State University.

June 2023, MathInGP Postdoctoral Research Symposium, Sorbonne Université.

March 2023, MAFRAN days, University of Cambridge.

December 2022, International Conference on Geometric Analysis and Hyperbolic Equations, Guangxi Center for Mathematical Research, Guangxi University.

November 2022, Workshop ‘Vlasov Equations: Geometric and Semi-classical Aspects’, Institut de Recherche Mathématique de Rennes.

April 2022, Oxbridge PDE Conference, Oxford.

December 2021, Partial Differential Equations Session, Annual Meeting of the Chilean Mathematical Society, Universidad de O’Higgins.

December 2021, MAFRAN days, Université Paris-Dauphine.

December 2020, CDT Student Conference, Cambridge.

## SEMINAR TALKS

- February 2026, Analysis Seminar, University of Bath.
- November 2026, General Relativity & PDE seminar, Leipzig University.
- October 2025, Applied PDE Seminar, Imperial College London.
- June 2025, Calculus of Variations & PDE Seminar, Universidad de O'Higgins.
- May 2025, Mathematical Physics Seminar, Pontificia Universidad Católica de Chile.
- April 2025, Princeton Gravity Initiative Seminar Series, Princeton University.
- April 2025, Geometric Analysis Colloquium, The Fields Institute.
- August 2024, Analysis of Applied PDEs Graduate Student Seminar, University of Toronto.
- July 2024, London PDE Seminar, UK.
- June 2024, Analysis and Geometry Seminar, Pontificia Universidad Católica de Chile.
- June 2024, PDE Seminar, Mathematical Engineering Department, Universidad de Chile.
- March 2024, Analysis Seminar, Columbia University.
- March 2024, Mathematical Physics Seminar, Johns Hopkins University.
- November 2023, Princeton Gravity Initiative Seminar Series, Princeton University.
- November 2023, Analysis of Applied PDEs Graduate Student Seminar, University of Toronto.
- September 2023, Analysis and Applied Math Seminar, University of Toronto.
- July 2023, Seminari di Metodi Analitici e Probabilistici, Università di Pisa.
- April 2023, PDE Seminar, Mathematical Engineering Department, Universidad de Chile.
- April 2023, Dynamical Systems Seminar of Santiago, Chile.
- March 2023, MAFRAN days, University of Cambridge.
- December 2022, Mathematical General Relativity Seminar, Sorbonne Université.
- June 2022, London PDE Seminar, UK.
- May 2022, Topics in General Relativity, University of Münster.
- April 2022, Early Career Math Colloquium, University of Arizona.
- February 2022, PDE Seminar, Brown University.
- January 2022, Analysis and Geometry Seminar, Pontificia Universidad Católica de Chile.
- December 2021, Mathematical General Relativity Seminar, Sorbonne Université.
- July 2021, Online Mathematical GR and Hyperbolic PDE Seminar.
- June 2021, Junior Analysis Seminar, Imperial College London.
- May 2021, CMI Student Seminar Series, University of Cambridge.

January 2021, Kinetic Theory Seminar, University of Cambridge.

November 2020, PDE Seminar, Mathematical Engineering Department, Universidad de Chile.

September 2019, Analysis and Geometry Seminar, Pontificia Universidad Católica de Chile.

September 2019, Graduate Student Seminar, Pontificia Universidad Católica de Chile.

July 2018, Dynamical Systems Seminar, Pontificia Universidad Católica de Chile.

July 2018, Dynamical Systems Seminar, Pontificia Universidad Católica de Valparaíso.

## TEACHING

Instructor, MAT137 Calculus with Proofs, University of Toronto, Fall 2024, Winter 2025.

Instructor, MAT136 Calculus II, University of Toronto, Winter 2024.

Instructor, MAT244 ODEs, University of Toronto, Fall 2023.

Example Class Instructor, Part III Analysis & PDEs (Master course), University of Cambridge, Michaelmas 2021.

Supervisions, Part II Differential Geometry, University of Cambridge, Lent 2020, Lent 2022.

Supervisions, Part IB Electromagnetism, University of Cambridge, Lent 2021.

Supervisions, Part II Linear Analysis, University of Cambridge, Michaelmas 2020.

Supervisions, Part II Integrable Systems, University of Cambridge, Michaelmas 2020.

Teaching Assistant, Topology, Pontificia Universidad Católica de Chile, Spring 2017.

Teaching Assistant, ODEs, Pontificia Universidad Católica de Chile, Winter 2017.

Teaching Assistant, Multivariable Calculus, Pontificia Universidad Católica de Chile, Fall 2015.

Teaching Assistant, Single Variable Calculus, Pontificia Universidad Católica de Chile, Spring 2014, Spring 2015.

## ACADEMIC HONORS

Scholarship PhD (2018–2022), CONICYT-Chile Cambridge Scholarship, Cambridge Trust.

Scholarship PhD (2018–2022), National Commission for Scientific and Technological Research, Chile.

Smith-Knight & Rayleigh-Knight Prize (2020), Faculty of Mathematics, University of Cambridge.

Scholarship MS (2018), National Commission for Scientific and Technological Research, Chile.

Scholarship MS (2017), Department of Mathematics, Pontificia Universidad Católica de Chile.

“Teaching Assistant of First Category”, Department of Mathematics, Pontificia Universidad Católica de Chile (2016).

Scholarship Rolando Chuaqui (2013–2016), Department of Mathematics, Pontificia Universidad Católica de Chile.

## SERVICE

Referee of Articles for: Acta Applicandae Mathematicae, Acta Mathematica Vietnamica, Annales Henri Poincaré, Annals of PDE, Archive for Rational Mechanics and Analysis, Communications in Mathematical Physics, Communications in Partial Differential Equations, Journal of Functional Analysis, Journal of Statistical Physics, SIAM Journal on Mathematical Analysis, Transactions of the American Mathematical Society.

Co-organiser of the London PDE Seminar, UK (2025–2026).

Co-organiser of the Paris Reading Group in General Relativity, Sorbonne Université (2022–2023).

Co-organiser of the MAFRAN Winter School: Particle Systems, PDEs and Inequalities, University of Cambridge (December 2020).

Co-organiser of Joint Cambridge Analysts' Knowledge Exchange – OxPDE Student Seminar, University of Cambridge and University of Oxford (Easter 2020).

Co-organiser of the Cambridge Analysts' Knowledge Exchange seminar, University of Cambridge (Lent 2020).

Organiser of the Differential Geometry Graduate Student Seminar, Pontificia Universidad Católica de Chile (2017–2018).

## OUTREACH

Invited talk, Graduate School of Churchill College, University of Cambridge (May 2021).

Instructor, Course “Introduction to Mathematical Reasoning” (TRM), special program for high school students. Pontificia Universidad Católica de Chile (2017–2018).

“da Vinci Dome”, Stand at Math Festival, San Antonio, Chile.

Instructor, Chilean Team for International Math Olympiads IMO and Iberoamerican (2016–2017).

Tutor, Program “Fun Math”, National Service for Minors of San Joaquin, Pontificia Universidad Católica de Chile (2017).

## PERSONAL INFORMATION

Born: March 1995, Santiago, Chile.

Citizenship: Chilean.

Languages: Spanish (native), English (fluent).