

# Leandro Sánchez-Betancourt

## Curriculum vitae

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### Academic posts

- 2022–present **Lecturer in Financial Mathematics**, *Department of Mathematics, King's College London*, Financial Mathematics research group.
- 2022–present **Academic visitor**, *Oxford-Man Institute for Quantitative Finance, University of Oxford*.
- 2021 **Research Associate**, *Department of Mathematics, Imperial College London*, Mathematical Finance research group.
- 2019–2021 **Graduate Teaching and Research Scholar**, *Oriel College, Oxford*.

### Education

- 2017–2021 **DPhil in Mathematics**  
**University of Oxford**, Mathematical Institute.  
Uncertain execution in order-driven markets.  
Supervisor: Professor Álvaro Cartea.
- 2016–2017 **MSc in Financial Mathematics**  
**King's College London**, Department of Mathematics.  
Dissertation: Stochastic control for optimal dynamic trading strategies.  
Overall mark: Distinction (94/100).  
Prize: *Best overall performance student award*.
- 2010–2014 **BSc in Actuarial Sciences**  
**Universidad Nacional Autónoma de México**, Facultad de Ciencias.  
Overall mark: 10/10.  
Prize: *Gabino Barreda Medal* (for top student).

### Awards, accomplishments, and scholarships

- 2021–present Co-investigator in the AFM-ATI collaboration. Funding for the project: £ 249,000 (year 1).
- 2019–2021 Graduate Teaching and Research Scholar in Mathematics, Oriel College, Oxford.
- 2019 Winner of the Financial Mathematics Team Challenge, Rio de Janeiro, Brazil.
- 2018–2021 Scholarship for doctoral studies at Oxford, awarded by Consejo Nacional de Ciencia y Tecnología, México (CONACyT).
- 2017–2020 Mathematical Finance Scholarship, awarded by the Mathematical Institute, Oxford.
- 2017 **Best overall performance student award**, for the highest marks in the MSc in Financial Mathematics, Department of Mathematics, King's College London.
- 2016 Scholarship for graduate studies at King's College London, awarded by CONACyT.
- 2016 Scholarship for graduate studies at King's College London, awarded by Secretaría de Educación Pública, México (SEP).
- 2016 **Gabino Barreda medal**, for top student in four-year undergraduate program, awarded by Universidad Nacional Autónoma de México (UNAM).
- 2011/12/13 Excellence Scholarship, awarded by SEP.
- 2008/09 Winner of the Mathematical Olympiad of México, at state level.
- 2007/08/09 Winner of the Mathematical Competition, over all schools of UNAM.
- 2004/05 Winner of the Mathematical Olympiad of Cuba, at national level.

## Professional memberships

London Mathematical Society (LSM); Institute of Mathematics and its Applications (IMA); Society for Industrial and Applied Mathematics (SIAM).

## Publications\* and submitted\* papers

- \* Á. Cartea and L. Sánchez-Betancourt (2022+). *Optimal Execution with Stochastic Delay*. *Finance and Stochastics* (to appear) [↓](#)
- \* Á. Cartea, S. Jaimungal, and L. Sánchez-Betancourt (2022+). *Deep Reinforcement Learning for Algorithmic Trading*. In *Machine Learning in Financial Markets: A guide to contemporary practices* (to appear). Edited by C.-A. Lehalle and A. Capponni. Cambridge University Press. [↓](#)
- \* Á. Cartea, S. Jaimungal, and L. Sánchez-Betancourt (2021) *Latency and Liquidity Risk*. *International Journal on Theoretical and Applied Finance* **24** (06n07), 2150035. [↓](#)
- \* M. Forde, L. Sánchez-Betancourt, and B. Smith (2021). *Optimal Trade Execution for Gaussian Signals with Power-law Resilience*. *Quantitative Finance* **22** (3), 585–596. [↓](#)
- \* G. Bouzianis, L. P. Hughston, S. Jaimungal, and L. Sánchez-Betancourt (2021). *Lévy-Ito Models in Finance*. *Probability Surveys* **18**, 132-178. [↓](#)
- \* Á. Cartea and L. Sánchez-Betancourt (2021). *The Shadow Price of Latency: Improving Intraday Fill Ratios in Foreign Exchange Markets*. *SIAM Journal on Financial Mathematics* **12** (1), 254–294. [↓](#)
- \* L. P. Hughston and L. Sánchez-Betancourt (2020). *Pricing with Variance Gamma Information*. *Risks* **8** (4), 105:1-22. [↓](#)
- \* Á. Cartea, I. Perez Arribas, and L. Sánchez-Betancourt (2020). *Optimal Execution of Foreign Securities: A Double-Execution Problem*. [↓](#)
- \* C. Bellani, D. Brigo, M. S. Pakkanen, and L. Sánchez-Betancourt (2022). *Non-average price impact in order-driven markets*. [↓](#)
- \* G. Bouzianis, L. P. Hughston, and L. Sánchez-Betancourt (2022). *Information-based Trading*. [↓](#)
- \* S. Jaimungal, S. Pesenti, and L. Sánchez-Betancourt (2022). *Minimal Kullback-Leibler for Constrained Lévy-Itô Processes*. [↓](#)

## Industry experience

- 2017–present **Researcher**, LMAX Exchange, London.  
Researcher in topics regarding latency, high-frequency trading, and FX trading.  
Micro-structure comparison between trading-on-firm venues against those with last look.
- 2015–2016 **Consultant**, Indra Business Consulting, Mexico City.  
Mathematical support for migration of Santander's risk-management platform.  
Analysis of methodological changes in derivative pricing in Murex.
- 2014–2015 **Risk analyst**, Citigroup, Mexico City.  
Development of internal debt rating model in collaboration with Citigroup New York.  
Responsible for monthly calculations of the regulatory reserves.

## Teaching experience

- 2022–present **Lecturer**, King's College London.  
  - Mathematical Finance II: Continuous Time
- 2021 **Research associate**, Imperial College London.  
  - Quantitative Risk Management (Core module for the MSc Mathematics and Finance)
- 2019–2021 **Graduate teaching and research scholar**, Oriel College, Oxford.  
  - Probability, Probability prelims (Michaelmas term 2019, 2020)
  - Integration, Statistics, Integral transforms (Hillary term 2020, 2021)
  - Statistics and data analysis (Trinity term 2020, 2021)
- 2018–2019 **Teaching appointments**, Queen's College, Oxford.  
  - Probability (Michaelmas term 2018)
  - Statistics and data analysis (Trinity term 2019)

- 2018–2021 **Tutor**, *Mathematical Institute, University of Oxford*.  
Graduate courses:  
  - Algorithmic trading, Asset pricing, Stochastic control, Market micro-structure.
- 2018–2021 **Teaching assistant**, *Mathematical Institute, University of Oxford*.  
Graduate courses:  
  - Stochastic control, Market micro-structure, Algorithmic trading, Asset pricing.
Undergraduate courses:  
  - Stochastic differential equations, Mathematical models for financial derivatives.
- Jul 2016 **Diplomat lecturer**, *Universidad Marista, Mexico City*.  
Lecturer for “Diplomat of Financial Derivatives”, Equity, FX and commodity derivatives module.
- Jul 2015 **Diplomat lecturer**, *Universidad Marista, Mexico City*.  
Lecturer for “Diplomat of Financial Risks”, Market risk module.
- 2014–2016 **Lecturer**, *Universidad Marista, Mexico City*.  
Undergraduate lecturer position:  
  - Stochastic processes, Statistics, Probability.

## Languages

- Spanish **Native speaker**  
English **Fluent**

## Academic visits, team projects, and outreach

- Jul 2019 **Financial Mathematics Team Challenge, Rio de Janeiro, Brazil**.  
*Team project: Hedging derivatives with price impact. Mentor: Dr Ryan Donnelly.*  
My role was that of team leader in this outreach project. Our team won the competition.
- Jun 2019 **Fields-China Joint Industrial Problem Solving Workshop in Finance, Fields Institute, Toronto**.  
*Team project: Deep Machine Learning and Volatility Prediction.*
- Jun 2018 **Academic visit to University of Toronto, Ontario, Canada**.  
*Collaboration with Professor Sebastian Jaimungal.*
- 2018–2020 **Christopher Hatton School, London**.  
*I led a weekly Math Club meeting for two years. I coached the students on Mathematical Olympiad problems for their age group.*

## Presentations made at conferences, seminars, and summer schools

- June 2022 **11th World Congress of Bachelier Finance Society, Hong Kong**.  
*Presentation given (online): Optimal Execution with Stochastic Delay.*
- May 2022 **CFM-EconophysiX lab seminar\***.  
*Presentation given (online): Non-average price impact in order driven markets.*
- Feb 2022 **University of Edinburgh seminar\***.  
*Presentation given (online): Internalise or Externalise: Brokers and Informed Trading.*
- Jan 2022 **1st London/Oxford/Warwick Financial Mathematics Workshop, London\***.  
*Presentation given (online): Internalise or Externalise: Brokers and Informed Trading.*
- Dec 2021 **CFE 2021, King's College London\***.  
*Presentation given (hybrid): Optimal Execution of Foreign Securities: A Double Execution Problem.*
- Jun 2021 **Big Data and Machine Learning in Finance Conference, Politecnico di Milano**.  
*Presentation given (online): Optimal Execution of Foreign Securities: A Double Execution Problem with Signatures and Machine Learning.*
- Jun 2021 **SIAM Conference on Financial Mathematics**.  
*Presentation given (online): Optimal Execution with Stochastic Delay.*
- Feb 2021 **IEOR seminar, Berkeley**.  
*Presentation given: Latency in Order-Driven Markets.*
- Oct 2020 **Mathematical Finance Internal Seminar, University of Oxford**.  
*Presentation given: Optimal Execution with Stochastic Delay.*
- Oct 2019 **21st Actuarial Congress: “A Model to Follow”, Universidad Marista, Mexico City**.  
*Presentation given: Latency in Electronic Markets.*

- Sep 2019 **12th European Summer School on Financial Mathematics, Padova.**  
*Presentation given: Optimal Order Placement with Random Measures.*
- Jun 2019 **SIAM Conference on Financial Mathematics, Toronto.**  
*Presentation given: Optimal Order Placement with Random Measures.*
- Mar 2019 **1st Oxford-ETH Workshop on Financial Mathematics, Oxford.**  
*Presentation given: Optimal Order Placement with Random Measures.*
- Aug 2018 **11th European Summer School on Financial Mathematics, Paris.**  
*Presentation given: Maximizing Fill Ratios in FX Markets with Latency, Volatility and Model Ambiguity.*
- Jul 2018 **10th World Congress of the Bachelier Finance Society, Dublin.**  
*Presentation given: Maximizing Fill Ratios in FX Markets with Latency, Volatility and Model Ambiguity.*
- May 2018 **Actuarial Sciences Conference, Universidad Marista, México City.**  
*Presentation given: The Shadow Price of Latency.*
- May 2018 **Mathematical Finance Internal Seminar, University of Oxford.**  
*Presentation given: The Shadow Price of Latency.*
- Jan 2018 **Market Microstructure, Imperial-CFM workshop, London.**  
*Poster presentation: Overcoming Latency in the Targeting of Fill Ratios.*
- Dec 2017 **LMAX Seminar, London.**  
*Presentation given: Overcoming Latency in the Targeting of Fill Ratios.*

## References

1. **Professor Álvaro Cartea.**  
 The Mathematical Institute, Oxford OX2 6GG, United Kingdom.  
[alvaro.cartea@maths.ox.ac.uk](mailto:alvaro.cartea@maths.ox.ac.uk)
2. **Professor Samuel N. Cohen.**  
 The Mathematical Institute, Oxford OX2 6GG, United Kingdom.  
[samuel.cohen@maths.ox.ac.uk](mailto:samuel.cohen@maths.ox.ac.uk)
3. **Professor Lane P. Hughston.**  
 Department of Computing, Goldsmiths University of London,  
 New Cross, London SE14 6NW, United Kingdom.  
[l.hughston@gold.ac.uk](mailto:l.hughston@gold.ac.uk)
4. **Professor Sebastian Jaimungal.**  
 Department of Statistical Sciences, University of Toronto,  
 Toronto, Ontario M5T 1P5, Canada.  
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