EYAL NEUMAN

WORK ADDRESS:
802 Weeks Hall
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Imperial College London
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ACADEMIC APPOINTMENTS

2023-present Reader (Associate Professor) at the Department of Mathematics, Imperial College London.

2021-2023 Senior Lecturer (Assistant Professor) at the Department of Mathematics, Imperial College London.

2018-2021 Lecturer (Assistant Professor) at the Department of Mathematics, Imperial College London.

2016-2018 CFM-Imperial Research Fellow in Quantitative Finance at Imperial College London.

2015-2016 Visiting Assistant Professor of Mathematics at the University of Rochester, NY.

2014-2015 IAS Postdoctoral Fellow at the Hong Kong University of Science and Technology.

ACADEMIC DEGREES

2010-2014 PhD in Operations Research,
Technion- Israel Institute of Technology, Haifa, Israel,
PhD thesis: *Pathwise uniqueness of the stochastic heat equation with spatially inhomogeneous white noise*.
Supervisor: Professor Leonid Mytnik.

2008-2010 Master of Science in Operations Research,
Technion- Israel Institute of Technology, Haifa, Israel, (Graduated with honors).
MSc thesis: *Sample path properties of Volterra processes.*
Supervisor: Professor Leonid Mytnik.

2005-2008 Bachelor of Science in Industrial Engineering,
Tel Aviv University, Tel Aviv, Israel.

RESEARCH INTERESTS

Mathematical Finance

- Market microstructure
- Optimal trading

Probability and Stochastic Processes

- Interacting particle systems
- Stochastic partial differential equations (SPDEs).

FUNDING

- External funding for initiation of a Fintech Lab at the Technion (Start date October 2018, total amount 575,000 USD).
- UKRI case studentship for Quantum Computing in Finance (start date January 2024, total amount 140,000 GBP).

PROFESSIONAL ACTIVITIES

Editorial Board

Associate Editor for Mathematical Finance (from January 2020).

Conferences Organization

- Advanced Mathematical Methods for Finance, Market Impact and Transaction Costs Session, Bielefeld, Germany June 26-30, 2023.
- CNRS-Imperial Workshop on Stochastic Analysis, Imperial College London, July 7-8, 2022.
- Advanced Mathematical Methods for Finance Conference, Market Microstructure session, Padova, June 22-25, 2021.
- CFM-Imperial Workshop on Market Microstructure, London, December 12-13, 2019.
- CFM-Imperial researchers meeting, Paris, October 1, 2019.
- The 2nd Imperial - CUHK Workshop on Quantitative Finance, Hong Kong, May 21-22, 2019.
- CFM-Imperial Workshop on Market Microstructure, London, December 11-12, 2017.

ADMINISTRATIVE DUTIES

- Co-director of the MSc in Mathematics and Finance at Imperial College (2021-current).
- Member of the research committee of the Department of Mathematics, Imperial College (2019-2023).
- Organiser of the Stochastic Analysis seminar at Imperial College (2019-2021).
- Organiser of the Finance and Stochastics seminar at Imperial College (2018-2019).

PUBLICATIONS

Preprints

32. Neuman E., Stockinger W. and Zhang Y., An Offline Learning Approach to Propagator Models*, arXiv:2309.02994, (2023) (submitted).*
31. Abi Jaber E., Neuman E. and Voß M., Equilibrium in Functional Stochastic Games with Mean-Field Interaction, *arXiv:2306.05433*, *(2023) (submitted).*
30. Mueller C. and Neuman E., The Radius of a Self-Repelling Star Polymer, arXiv:2306.01537*, (2023) (submitted).*

29. Neuman E. and Zhang Y., Statistical Learning with Sublinear Regret of Propagator Models, *arXiv:2301.05157*, *(2023) (submitted).*
28. Abi-Jaber, E. and Neuman E., Optimal Liquidation with Signals: the General Propagator Case*, arXiv:2211.00447, (2022) (submitted).*
27. Micheli A. and Neuman E., Fast and Slow Optimal Trading with Exogenous Information, *arXiv:2210.01901, (2023) (submitted).*
26. Lehalle C. A., Neuman E. and Shlomov S., Phase Transitions in Kyle's Model with Market Maker Profit Incentives*, arXiv:210304481, (2021) (submitted).*

Refereed papers in professional journals

25. Micheli A., Muhle-Karbe J. and Neuman E., Closed-Loop Nash Competition for Liquidity, *Mathematical Finance, Vol. 33, No. 4, 1082–1118 (2023).*
24. Neuman E. and Voß M., Trading with the Crowd, *Mathematical Finance, Vol. 33, No. 3, 548-617 (2023).*
23. Mueller C. and Neuman E., The Effective Radius of Self Repelling Elastic Manifolds, *Annals of Applied Probability, Vol. 32, No. 6, 4251-4278 (2022).*
22. Micheli A. and Neuman E., Evidence of crowding on Russell 3000 reconstitution events, *Market Microstructure and Liquidity,Vol. 5, No. 2 (2022).*
21. Mueller C. and Neuman E., Self-Repelling Elastic Manifolds with Low Dimensional Range, *Journal of Stochastic Analysis, Vol. 3, No. 2, Article 1 (2022).*
20. Neuman E. and Voß M., Optimal signal-adaptive trading with temporary and transient price impact*, SIAM J. Financial Mathematics, Vol. 13, No. 2, 551-575 (2022).*
19. Hager P. and Neuman E., The multiplicative chaos of *H=0* fractional Brownian fields, *Annals of Applied Probability, Vol. 32, No. 3, 2139-2179 (2022).*
18. Brigo D., Graceffa F. and Neuman E., Price Impact on Term Structure*, Quantitative Finance, Vol. 22, No. 1, 171-195 (2022).*
17. Neuman E. and Schied A., Protecting pegged currency markets from speculative investors, *Mathematical Finance, Vol. 32, No. 1, (2022).*
16. Mueller C. and Neuman E., Scaling properties of a moving polymer*, arXiv: 2006.07189, to appear in the Annals of Applied Probability, (2021).*
15. Neuman E. and Zheng X., On the maximal displacement of near-critical branching random walks*, Probability Theory and Related Fields, Vol. 180, 199-232 (2021).*
14. Bellani C., Brigo D., Done A., Neuman E., Optimal trading: The importance of being adaptive, *International Journal of Financial Engineering, Vol. 08, No. 04, (2021).*
13. Neuman E., Schied A., Weng C., and Xue, X., A Central Bank Strategy for Defending a Currency Peg, *Systems and Control Letters, Vol. 144, (2020).*
12. Mueller C., Neuman E., Salins M. and Truong G., An improved uniqueness result for a system of stochastic differential equations related to the stochastic wave equation, *Journal of Stochastic Analysis, Vol. 1, No. 2, (2020)*
11. Lee J. J., Mueller C., Neuman E., Hitting probabilities of a Brownian flow with radial drift, *Annals of Probability, Vol. 48, No. 2, 646–671, (2020).*

10. Lehalle C. A. and Neuman E., Incorporating signals into optimal trading, *Finance and Stochastics 23:275–311, (2019).*
9. Neuman E. and Rosenbaum M., Fractional Brownian motion with zero Hurst parameter: a rough volatility point of view*, Electronic Communications in Probability, 23(61), (2018).*
8. Neuman E., Pathwise uniqueness of the stochastic heat equation with spatially inhomogeneous white noise, *Annals of Probability, 46(6), (2018).*
7. Gomez A., Lee J. J., Mueller C., Neuman E. and Salins M., On uniqueness and blowup properties for a class of second order SDEs, *Electronic Journal of Probability, 22(72), (2017).*
6. Neuman E. and Zheng X., On the maximal displacement of subcritical branching walks, *Probability Theory and Related Fields, 167(3), 1137-1164, (2017).*
5. Neuman E. and Schied A., Optimal Portfolio Liquidation in target zone models and catalytic superprocesses, *Finance and Stochastics, 20, 495–509, (2016).*
4. Mytnik L. and Neuman E., Pathwise uniqueness of the stochastic heat equations with Hölder continuous noise and drift coefficients, *Stochastic Processes and their Applications, 125(9), 3355–3372, (2015).*
3. Gertsbakh I., Neuman E. and Vaisman R., Monte Carlo for estimating exponential convolution*, Communications in Statistics - Simulation and Computation, 44(10): 2696-2704 (2015).*
2. Neuman E., The multifractal nature of Volterra-Lévy processes, *Stochastic Processes and their Applications, 124(9): 3121-3145, (2014)*
1. Mytnik, L. and Neuman E., Sample path properties of Volterra processes, *Communications on Stochastic Analysis, 6(3): 359-377, (2012).*

Theses

MSc thesis

Sample path properties of Volterra processes, Technion, August 2010.

PhD thesis

Pathwise uniqueness of the stochastic heat equations with spatially inhomogeneous white noise, Technion, May 2014.

POSTDOCTORAL FELLOWS

- Wolfgang Stockinger - Chapman Fellowship in Mathematics, started in 2022.
- Yonatan Shadmi - Chapman Fellowship in Mathematics, started in 2023.

PHD STUDENTS

- Mikolaj Binkowski, from Imperial College, PhD. in Mathematical Finance, defended in October 2020.
- Francesco Capponi from Imperial College, PhD. in Mathematical Finance, defended in April 2021.

- Federico Graceffa from Imperial College, PhD. in Mathematical Finance, defended in November 2021.
- Alessandro Micheli, from Imperial College, PhD. in Mathematical Finance, defended in March 2023.
- Robert Boyce from Imperial College, PhD. in Mathematical Finance, started in September 2023.
- Sturmius Tuschmann, from Imperial College, PhD. in Mathematical Finance, started in September 2023.

MSc STUDENTS

- Alex Done from Imperial College, MSc. in Mathematics and Finance.
  MSc. thesis: Static and Dynamic Execution Strategies in the Presence of Liquidity Signals, graduated in September 2018.
- Paul Faure from ENSTA ParisTech, MSc. in Mathematics and Finance.
  MSc. thesis: Data analysis of predictive trading signals, graduated in September 2017.
- Hu Yi from Imperial College, MSc. in Mathematics and Finance.
  MSc. thesis: Incorporating signals into optimal trading with non-linear temporary market impact, graduated in September 2017.

MSc STUDENTS JOINT WITH INDUSTRIAL PARTNERS

- 5 students in 2018/2019,
- 5 students in 2019/2020,
- 6 students in 2020-2021.
- 5 students in 2021-2022.
- 6 students in 2022-2023.

INVITED MINICOURSES

- Algorithmic and High-Frequency Trading, Technion, Israel, April 26-May 31, 2022.
- Algorithmic and High-Frequency Trading, Technion, Israel, April 26-May 31, 2021.
- Algorithmic and High-Frequency Trading, Technion, Israel, March 26-April 20, 2020.

INVITED TALKS – CONFERENCES

- SIAM Conference on Financial Mathematics and Engineering, Philadelphia, USA, June 3-6, 2023.
- Volatility is rough, so now what? Isle of Skye, Scotland, May 22-26, 2023.
- Conference in Mathematics of Random Systems, ICMS Edinburgh, April 24-26, 2023.
- Workshop on price impact, Capital Fund Management, Paris, April 19-20, 2023.

- Stochastic Control and Quantitative Finance, Hebrew University of Jerusalem, September 12-14, 2022.
- Joint CNRS-Imperial Workshop on Stochastic Analysis and Applications, Imperial College London, July 7-8, 2022.
- LMS-Birmingham Workshop on Stochastics Partial Differential Equations: Analysis and Computations, University of Birmingham, June 27-28, 2022.
- Workshop on Rough Volatility, Imperial College London, March 15-16, 2022.
- INFORMS 2021 Annual Meeting, Anaheim, California, Oct. 24-27, 2021.
- Siam Conference on Financial Mathematics and Engineering, Philadelphia, June 1-4, 2021.
- London-Paris Bachelier Workshop in Financial Mathematics, Paris, March 11-12, 2021.
- The 3rd Haifa probability school, Technion, Israel, February 23-28, 2020.
- The 12th Berlin-Oxford meeting, Mathematical Institute, Oxford, December 4-6, 2019.
- Vienna Congress on Mathematical Finance, WU Vienna, Austria, September 9-11, 2019.
- The 2nd Imperial - CUHK Workshop on Quantitative Finance, Hong Kong, May 20-21, 2019.
- 9th International workshop on applied probability, Budapest, Hungary, June 18-21, 2018.
- 3rd Bar-Ilan conference on mathematical finance, Bar-Ilan University, Israel, May 30-31, 2018.
- Imperial-ETH Workshop on Mathematical Finance, ETH Zurich, April 4-6, 2018.
- CFM-Imperial Workshop on Market Microstructure, London, December 11-12, 2017.
- Imperial-ETH Workshop on Mathematical Finance, Imperial College London, March 27-29, 2017.
- Mathematics of Quantitative Finance, Mathematisches Forschungsinstitut Oberwolfach, Germany, February 26 – March 4, 2017.
- Finance & Stochastics Day, Imperial College London, October 13, 2016.
- London-Paris Bachelier Workshop on Mathematical Finance, Féderation Bancaire Française, Paris, September 29-30, 2016.
- Imperial-ETH Workshop on Mathematical Finance, ETH Zurich, September 26-28, 2016.
- The Canadian Mathematical Society Winter Meeting, Montreal, Canada, December 4-7, 2015.
- The Third Asian Quantitative Finance Conference, Chinese University of Hong Kong, Hong Kong, July 6-8, 2015.
- The Mathematics of High Frequency Financial Markets: Limit Order Books, Frictions, Optimal Execution and Program Trading, University of California, Los Angeles, USA, April 13 - 17, 2015.

INVITED TALKS - SEMINARS

- Stochastic Analysis Seminal, Imperial College London, October 17, 2023.
- Financial and Insurance Mathematics Seminar, October 19, 2023.
- Bachelier Seminar, Institut Henri Poincaré, Paris, September 29, 2023.

- Mathematical Finance Seminar, École Polytechnique, Paris, September 28, 2023.
- Financial Mathematics Seminar, TU Berlin, May 11, 2023.
- Stochastic Finance Seminar Series, University of Warwick, May 2, 2023.
- UCL Quant Society research panel, University College London, February 9, 2023.
- Imperial College London, Finance and Stochastics Seminar, February 7, 2023.
- London Mathematical Finance Seminar Series, London School of Economics, February 2, 2023.
- Imperial College London, Control and Optimization Seminar, November 9, 2022.
- Ludwig Maximilian University of Munich, Seminar on finance and insurance mathematics, October 18, 2022.
- London School of Economics, Joint Risk & Stochastics and Financial Mathematics Seminar, February 24, 2022.
- Humboldt-Universität zu Berlin, Mathematical Finance Seminar, November 11, 2021.
- Oxford Mathematical and Computational Finance Seminar, University of Oxford, April 29, 2021.
- Tufts Computational and Applied Math Seminar, Tufts University, December 14, 2020.
- Bristol Probability Seminar, University of Bristol, March 13, 2020.
- Finance & Modeling Seminar, Université Paris 1, Paris, February 12, 2020.
- TU Berlin, Rough paths and stochastic partial differential equations seminar, May 2, 2019.
- Technion, Faculty of IE&M colloquium talk, Haifa, Israel, April 17, 2019.
- University of Oxford, Mathematical & Computational Finance Seminar, February 14, 2019.
- Imperial College London, Stochastic Control Seminar, January 30, 2019.
- University of Cambridge, The Isaac Newton Institute for Mathematical Sciences, November 2, 2018.
- University of Bath, Probability Seminar, October 1, 2018.
- Imperial College London, Finance and Stochastics Seminar, March 21, 2018.
- UC Santa Barbara, Department of Statistics and Applied Probability, January 18, 2018.
- Carnegie Mellon University, Department of Mathematical Sciences, January 16, 2018.
- London Mathematical Finance Seminar, King's College London, November 16, 2017.
- École nationale de la statistique et de l'administration économique, Paris, France, November 6, 2017.
- University of Strathclyde, Glasgow, UK, October 18, 2017.
- Oxford University, stochastic analysis seminar, UK, October 16, 2017.
- Tel Aviv University, Industrial Engineering seminar, Tel Aviv, Israel, November 17, 2016.
- Worcester Polytechnic Institute, Stochastic Analysis and Financial Mathematics seminar, Worcester, MA, USA, January 16, 2016.
- Department of Mathematics seminar, University of Macau, Macau, November 3, 2014.

- Post/Doctoral seminar in Mathematical Finance ETH Zurich, Switzerland May 6, 2014.
- Research Seminar, Tel Aviv University - Faculty of engineering, Israel, November 19, 2013.
- Probability seminar, University of Duisburg-Essen, Germany, September 18, 2013.
- Research Seminar in Mathematical Econometrics, Stochastics and Finance, University of Mannheim, Germany, September 3, 2013.

CONTRIBUTED TALKS

- Bachelier Finance Society – 10th World Congress, Trinity College, Dublin, July 16-20, 2018
- Conference on Stochastic Control, Ambiguity and Games, University of Leeds, UK, September 4-5, 2017.
- International Workshop on BSDEs, SPDEs and their Applications, University of Edinburgh, July 3-7, 2017.
- Interacting Systems and SPDEs, University of Sheffield, June 13-15, 2017.
- Young Finance Scholars' Conference, University of Sussex, June 12-13, 2017.
- Technion Seminar in Probability and Stochastic Processes, November 15, 2016.
- Technion Quant Seminar, November 14, 2016.
- Probability Seminar, University of Rochester, May 29, 2016.
- The 38th Conference on Stochastic Processes and their Applications, Oxford, UK, July 13-17, 2015.
- Stochastic Processes and Random Fields: Geometry and Fine properties, Technion, Israel, June 29- July 3, 2015.
- Technion Seminar in Probability and Stochastic Processes, January 4, 2014.
- NSF/CBMS Conference - Analysis of Stochastic Partial Differential Equations, Michigan State University, August 19-23, 2013.
- 36th Conference on Stochastic Processes and Their Applications, University of Colorado Boulder, July 29 - August 2, 2013.
- École d'été de Probabilités de Saint-Flour, Saint-Flour, France, July 8-21, 2012.
- Students Probability Day III, Weizmann Institute of Science, Israel, May 12, 2011.
- École d'été de Probabilités de Saint-Flour, Saint-Flour, France, July 17-24, 2010.
- Technion Probability and Stochastic Processes Seminar, January 26, 2010.

TEACHING EXPERIENCE

2017-Current Lecturer at Imperial College in the following courses:

- Algorithmic and High-Frequency Trading (graduate), Spring 2020 and 2021.
- Stochastic Control in Finance (graduate), Spring 2020 and 2021.
- Stochastic Processes (graduate), Fall 2019, 2020 and 2021.
- Numerical Methods in Finance (graduate), Fall 2018.
- Stochastic Calculus (graduate), Spring 2017.

2015-2015 Lecturer at the University of Rochester, NY, in the following courses:

- Nonlinear ODEs and Dynamical Systems (undergraduate)
- Calculus 2 (undergraduate)
- Introduction to Probability (undergraduate)

2012-2014 Lecturer at the Technion in the following courses:

- Mathematical Finance (graduate)
- Introduction to Probability (undergraduate)

2008-2012 Teaching assistant at the Technion in the following courses:

- Stochastic Processes (graduate)
- Introduction to Probability (undergraduate)
- Stochastic Models (undergraduate)
- Digital Simulation (undergraduate)

REFEREE/REVIEWER

- *Annals of Applied Probability, Operations Research, Mathematical Finance, Electronic Journal of Probability, Stochastic Processes and their Applications, Finance and Stochastics, SIAM Journal on Financial Mathematics, SIAM Journal on Control and Optimization, Mathematics of Operational Research, Stochastic Analysis and Applications, Statistics and Probability Letters, Journal of Applied Probability, Advances in Applied Probability, Market Microstructure and Liquidity, Applied Mathematical Finance, Operational Research, Frontiers in Artificial Intelligence, Annales de l'Institut Henri Poincaré , Stochastics.*

HONORS

2023 The 2023 Natixis Prize for the Best Master's Thesis (Thesis advisor of Tianhao Wang)

2017 Best paper in quantitative finance award, at the 4th Young Finance Scholars' Conference, University of Sussex, June 12-13, 2017.

2016 CFM-Imperial Research Fellowship in Quantitative Finance at Imperial College London.

2011-2013 Various awards for excellence in teaching at the Technion.

2010 Rubinstein-Kaiden award for excellence in research at the Technion.