

# Christa Cuchiero

born in Austria on April 13, 1983  
Nationality: Austrian

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## Education

- March 2018 **Habilitation (venia docendi) in Mathematics**, *University of Vienna*.
- July 2007–April 2011 **Ph.D. in Mathematics**, *ETH Zürich*, Supervisor: Prof. Josef Teichmann,  
Co-supervisor: Prof. Damir Filipović.  
awarded with the ETH medal
- Oct. 2001–Oct. 2006 **M.Sc. in Technical Mathematics**, *Vienna University of Technology*.  
Major: Applied Mathematics in Economics, diploma with highest distinction
- Sept. 2004–May 2005 **Applied Mathematics**, *Ecole Centrale Paris*.  
Emphasis on Probability and Mathematical Finance
- June 2001 **Matura**, *Akademisches Gymnasium Linz*.  
obtained with highest distinction

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## Employment and Academic Positions

- May 2020–present **Professor**, *Vienna University*, Department of Statistics and Operations  
Research.
- Jan. 2020– April 2020 **Professor**, *Université de Paris (Diderot)*, Laboratoire de Probabilités,  
Statistique et Modélisation.
- March 2019–Dec. 2019 **Assistant professor (tenure track)**, *Vienna University of Economics and  
Business*, Institute of Statistics and Mathematics.
- Okt. 2014–Feb.2019 **Assistant professor**, *University of Vienna*, Faculty of Mathematics.
- Okt. 2016–Feb. 2017 **Research visit**, *ETH Zürich*, Department of Mathematics, invited by the  
FIM (Forschungsinstitut für Mathematik).
- April 2013–Sept. 2014 **Assistant professor**, *Vienna University of Technology*, Financial and Ac-  
tuarial Mathematics.
- Jan. 2012–March 2013 **Postdoc position**, *University of Vienna*, Faculty of Mathematics.
- May 2011–Dec. 2011 **Postdoc position**, *ETH Zürich*, Department of Mathematics.
- July 2009–April 2011 **Ph.D. position**, *ETH Zürich*, Department of Mathematics.
- July 2007–June 2009 **Ph.D. position**, *Vienna University of Technology*, Financial and Actuarial  
Mathematics, START-prize project “Geometry of Stochastic Differential  
Equations”.
- Sept. 2006–June 2007 **Risk Analyst**, *AGF France (Allianz Group)*, Paris, Risk Management.
- Aug. 2005–Aug. 2006 **Internship at Allianz Elementar**, *ALM & Risk Controlling*, Vienna.

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## Current Research Interests

Stochastic Analysis, Probability Theory & Statistics	stochastic processes, in particular affine and polynomial processes on different state spaces in finite and infinite dimensions, Volterra processes, measure valued processes, McKean-Vlasov SDEs, interacting particle systems, mean field control and games, stochastic representations and numerics of (non-linear) PDEs, semimartingale theory, functional analytic methods, statistics of stochastic processes, statistics with high-frequency data, covariance estimation, robust model calibration.
Mathematical Finance and Quantitative Risk Management	multivariate stochastic and rough volatility modeling, machine learning in finance, stochastic portfolio theory, modelfree portfolio optimization, systemic risk, large financial markets, arbitrage theory, interest rate theory, energy modeling
Machine Learning and Data Science	signature methods, universal approximations theorems in static and dynamic situations, data driven risk inference, deep neural networks, reservoir computing
Applications in Biology and Physics	population genetics, probabilistic formulations of Stefan type problems

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## Awards and Prizes

2019	<b>START Prize</b>
2018	<b>Bruti-Liberati Visiting Fellowship in Sydney 2018</b>
2017	<b>Prix de l'Institut Europlace de Finance (EIF):</b> Best paper award in finance for the article “A General HJM Framework for Multiple Yield Curve Modeling” jointly written with Claudio Fontana and Alessandro Gnoatto
2012	<b>Ph.D. thesis awarded with the ETH medal</b> (granted to the best 8% of Ph.D. theses completed at ETH each year)
2002–2004	<b>Scholarships for outstanding studies</b> awarded by the TU Vienna

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## Successful application for third party funded research projects

2021	<b>OeAD - Project: “Polynomial Volterra processes and their applications in finance”</b> (travel funds to cooperate with Eduardo Abi-Jaber, Sergio Pulido and Sara-Svaluto-Ferro), 6000 EUR
2019	<b>START - Prize: “Universal structures in Mathematical Finance”</b> , 72 months, 1 200 000 EUR
2018	<b>DFG - FWF - Project: “Dynamic uncertainty modeling”</b> , PI in Vienna (jointly with Thorsten Schmidt and Irene Klein), 36 months, 324 000 EUR
2016	<b>WWTF - Project: “Macroprudential bank regulation: a continuous time approach”</b> , joint application with Walter Schachermayer and Jean-Charles Rochet, July 2017 - Dec. 2021, 600 000 EUR

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## Co-Organization of Conferences and Workshops

November 2024	Oberwolfach Workshop: Directions in Rough Analysis, Oberwolfach, Germany
September 2023	Wolfgang Pauli Workshop: Stochastics, Statistics and Machine Learning and their Applications to Sustainable Finance and Energy Markets, Vienna, Austria

- August 2023 BIRS Workshop: Stochastic Analysis, Mathematical Finance and Economics, Hangzhou, China
- June 2023 Workshop at IMSI: Laplacian growth models: theory and applications, Chicago, US
- June 2022 Advances in Mathematical Finance and Optimal Transport, Pisa, Italy
- December 2021 Organisation of an invited session at the 15th International Conference on Computational and Financial Econometrics (CFE 2021), London, UK
- March 2021 - present World Online Seminars on Machine Learning in Finance
- December 2020 Workshop on Representations of Jump Diffusions, Berlin-Vienna (online)
- October 2020 - present Vienna Seminar in Mathematical Finance and Probability, Vienna, Austria
- September 2020 High dimensional Stochastics, Vienna, Austria
- September 2020 13th European Summer School in Financial Mathematics, Vienna, Austria
- June 2019 Mini-symposium “Universal structures in Mathematical Finance”, ICASQF Conference, Manizales, Colombia
- June 2019 Member of the Scientific Committee for the AMaMeF Conference 2019
- Jan. 2019 Quantitative Finance Workshop 2019, Zurich, Switzerland
- July 2018 Workshop “Dynamic uncertainty modeling”, Strobl, Austria
- Sept. 2017 Mini-symposium “Affine and polynomial processes in Finance”, ICCF2017 Conference, Lisbon, Portugal
- Sept. 2016 Conference “Vienna Congress of Mathematical Finance”, Vienna, Austria
- April 2016 Workshop “Pathwise methods, functional calculus and applications in Mathematical Finance”, Vienna, Austria
- 2015-present Several editions of the “Freiburg-Padova-Vienna-Zurich-Seminar”, Research meeting between the Mathematical Finance groups of Freiburg, Padova, Vienna and Zurich
- Sept. 2015 Workshop “Mathematical Finance beyond classical models”, Zurich, Switzerland
- Aug. 2015 Mini-symposium “Modeling in Finance beyond classical paradigms” , ICIAM Conference, Beijing, China
- Sept. 2014 2nd European Actuarial Journal (EAJ) Conference, Vienna, Austria
- Aug. 2013 6th European Summer School in Financial Mathematics, Vienna, Austria
- July 2012 Organization of the Mini-symposium “Matrix valued processes and multivariate stochastic volatility modeling”, SIAM Conference, Minneapolis, USA

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## Editorial activities and referee activity

- January 2022 - Guest Editor for the Special Issue “Machine Learning in Finance” of Mathematical Finance
- January 2022 - Associate Editor for the SIAM Journal on Financial Mathematics
- September 2021 - Associate Editor for Frontiers of Mathematical Finance
- January 2021 - Associate Editor for Stochastics
- January 2020 - Associate Editor for Mathematical Finance
- July 2018 - Associate Editor for the Journal of Computational Finance
- Jan. 2017 - Associate Editor for Finance and Stochastics

Referee activity	Annals of Applied Probability, Electronic Journal of Probability, Finance and Stochastics, Mathematical Finance, Probability Theory and Related Fields, SIAM Journal on Financial Mathematics, Sigma, Statistics and Probability Letters, Stochastic Processes and their Applications, etc.
Scientific committees	Senior Programm Committee for ACM International Conference on AI in Finance, Member of the Scientific Committee of CFE 2021

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## University service

October 2022	Vice director of the PhD study programm in Business, Economics and Statistics
October 2022	Executive board member of the research network Data Science @ Uni Vienna
External member of hiring committees	Maître de conférence in Mathematical Finance at (i) University of Évrý Val d'Essonne and at (ii) ENSIIE, 2020; Full professor in Probability and Statistics at the Institut Élie Cartan of the University of Lorraine in Nancy, 2022
Internal member of hiring committees	Tenure track positions in Stochastic Methods for Data Science and in Governance, Organizational Design and Digitalization (2020), Full professorship in Optimization (2022)

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## Referee positions and grant review panels

Grant reviewer	National Science Centre, Poland (NCN) Dutch Research Council (NWO)
Reviewer	for habilitation committees, tenure committees and hiring committees
Jury member	Bruti Liberati prize for best thesis
Jury member	(External) jury member in several thesis and habilitation committees

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## Memberships

Member of the Young Academy, Austria  
 Bachelier Finance Society, Council member  
 Louis Bachelier Fellow  
 Wolfgang Pauli Institute, Vienna

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## Talks

more than 180

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## Invited Talks (January 2019 - October 2022, key note speaker is highlighted with (\*))

“**Signatures methods in finance**”  
 • PhD course, Padova, September 2022

**“Universal approximation theorems for continuous functions of càdlàg paths and Lévy-type signature models”**

- Third Symposium on Machine Learning and Dynamical Systems, Toronto, Fields Institute, September 2022
- Stochastic & Rough Analysis Berlin, August 2022

**“Signature methods in stochastic portfolio theory”**

- IFAM seminar, Liverpool (online), October 2022
- Stochastic Control and Quantitative Finance, Jerusalem, September 2022
- 10th Austrian stochastic days, Vienna, September 2022 (\*)
- BIRS Workshop: New interfaces of Stochastic Analysis and Rough Paths (online), September 2022
- Financial Mathematics Session at the AMS-EMS-SMF International Meeting, Grenoble, July 2022
- Mini symposium LMU München, June 2022

**“Measure-valued processes for energy markets”**

- Recent developments in stochastics with applications in mathematical physics and finance, Hammamet, October 2022
- FIMA 2022: On the Interplay between Finance and Insurance Mathematics, Lisbon, May 2022
- XXIII Quantitative Finance Workshop, Rome, April 2022
- BIRS Workshop: Stochastic Mass Transports (online), March 2022
- Spatus-Workshop, Oslo (online), August 2020

**“Randomized signature for approximation of dynamic processes”**

- DNA Seminar - Norwegian University of Science and Technology (online), March 2022

**“Optimal bailout strategies and the drift-controlled supercooled Stefan problem”**

- IMSI Workshop on Machine Learning and Mean-Field Games Chicago (online), May 2022
- Quantact Seminar (online), Montréal, May 2022
- Spring Colloquium on Probability and Finance dedicated to Wolfgang Runggaldier on the occasion of his 80th birthday, Padova, April 2022
- Columbia Mathematical Finance Seminar, New York (online), April 2022
- Manchester Probability Seminar, Manchester (online), March 2022
- 13th International Workshop on Stochastic Models and Control, Travemünde, March 2022
- Mathematical Finance Seminar ETH Zurich, December 2021

**“Signature SDEs as affine and polynomial processes”**

- Winter Seminar on Mathematical Finance, Netherlands (online), January, 2022
- First Florence-Paris Workshop on Mathematical Finance, Florence, October 2021
- Next Generation Models of Financial Data, Burghausen, September 2021

**“From neural SDEs and signature methods to affine and polynomial processes and back”**

- Lecture at 2nd International Summer School on Financial Mathematics, Moscow (online), August 2021 (\*)
- Lecture at Introduction to Decision Making and Uncertainty - Machine learning and Mean Field Games, Chicago (online), July 2021 (\*)

**“Signature based models in finance: relation to affine and polynomial processes, calibration and inclusion of jumps”**

- 25th International Symposium on Mathematical Theory of Networks and Systems, Bayreuth, September 2022
- Summer school on Distributed Control: Decentralization and Incentives, Luminy (online), June 2021
- Online conference beyond the boundaries: new directions in financial and actuarial mathematics, Leeds (online), May 2021

**“Universality of affine and polynomial processes”**

- Cumulants in Stochastic Analysis, Berlin (online), February 2021
- North British Probability Seminar, University of Edinburgh (online), February 2021
- Berlin Probability Colloquium, Berlin (online), February 2021
- Workshop on Representations of Jump Diffusions, Berlin-Vienna (online), December 2020
- Vienna Probability Seminar (online), Vienna, November 2020
- Workshop on new Challenges in the Interplay between Finance and Insurance, Oberwolfach (online), October 2020 (\*)
- Bachelier-One-World-Seminar (online), September 2020 (\*)
- Conference on High-Dimensional Stochastics, Vienna (online), September 2020

**“From signature methods in finance to affine and polynomial processes and back”**

- 6th Berlin workshop for young researchers (online), August 2021 (\*)
- Bernoulli-IMS 10th World Congress in Probability and Statistics, Seoul (online), July 2021
- Virtual Princeton-Rutgers Financial Math Seminar, New Jersey (online), April, 2021
- UCLA - Financial and Actuarial Mathematics Seminar, Los Angeles (online), February 2021
- WU Wien - Institute for Statistics and Mathematics Vienna (online), January 2021

**“Deep neural networks, generic universal interpolation and controlled differential equations”**

- Oxford Stochastic Analysis and Mathematical Finance Seminar, Oxford (online), October 2020
- Advances in Financial Mathematics 2020, Paris, January 2020 (\*)
- Seminar talk, Oslo, November 2019
- Vienna Congress on Mathematical Finance, Vienna, September 2019 (\*)

**“A neural network approach to calibration of local stochastic volatility models”**

- Workshop on Market generators, London (online), May 2020
- Fifth Workshop on Dynamical Systems and Brain-Inspired Information Processing, Konstanz, July 2019
- 9th General AMaMeF Conference, Paris, June 2019

**“Neural network approaches to infinite dimensional calibration and prediction problems”**

- Seminar at UCSB, Santa Barbara (online), April 2020
- QMF 2019, Sydney, December 2019 (\*)

**“Consistent minimal market models for the growth optimal portfolio”**

- Paris Bachelier Seminar, Paris, March 2020
- Workshop in honour of Eckhard Platen, Sydney, December 2019 (\*)

**“Machine Learning in Finance”**

- Talk at the insurance company Uniqa, Vienna, November 2019

**“Rough covariance modeling - theory and empirics”**

- Cournot seminar: “ From Microscopic Models to Rough Macroscopic Models” February 2022 • Frontiers in Quantitative Finance, Copenhagen, November 2019
- ÖMG Conference, Dornbirn, September 2019
- ICASQF, Manizales, June 2019
- SIAM Conference on Financial Mathematics and Engineering, June 2019 (\*)
- Research seminar in financial and insurance mathematics, ETH Zurich, March 2019
- Bachelier Colloquium, Metabief, January 2019 (\*)

**“Learning multi-curve interest rate models”**

- ICIAM 2019, Recent advances in interest rate modeling, Valencia, July 2019

**“Existence and stability for stochastic Volterra equations with jumps”**

- Stochastic processes and their applications, Chicago, July 2019

**“Universal portfolios and model-free portfolio optimization”**

- Algorithmic Trading Group Seminar, May 2022
- SIAM Conference on Financial Mathematics and Engineering, June 2019

**“Infinite dimensional polynomial processes”**

- Kolloquium Wahrscheinlichkeitstheorie, Berlin, May 2019

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**Programing skills**

Matlab, Python, R

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**Languages**

German (native), English (fluent), French (fluent)

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## Teaching experience

- Fall 2022 **Advanced stochastic modeling**, *University of Vienna*.
- Fall 2022 **Linear Algebra**, *University of Vienna*.
- Fall 2022 **Financial Mathematics and Insurance Mathematics**, *University of Vienna*.
- Spring 2022 **Advanced stochastic modeling**, *University of Vienna*.
- Spring 2022 **Seminar in Statistics for Master Studies (Machine Learning in Finance)**, *University of Vienna*.
- Spring 2022 **Mathematical Optimization**, *University of Vienna*.
- Fall 2021 **Advanced stochastic modeling**, *University of Vienna*.
- Fall 2021 **Linear Algebra**, *University of Vienna*.
- Fall 2021 **Introduction to Mathematical Finance**, *University of Vienna*.
- Spring 2021 **Advanced stochastic modeling**, *University of Vienna*.
- Spring 2021 **Seminar in Statistics for Master Studies (Machine Learning in Finance)**, *University of Vienna*.
- Spring 2021 **Mathematical Optimization**, *University of Vienna*.
- Fall 2020 **Advanced stochastic modeling**, *University of Vienna*.
- Fall 2020 **Linear Algebra**, *University of Vienna*.
- Fall 2020 **Introduction to Mathematical Finance**, *University of Vienna*.
- Spring 2020 **Mathematical Optimization**, *University of Vienna*.
- Spring 2020 **Mathematical Finance I**, *Université de Paris*.
- Spring 2020 **Lecture for Machine Learning in Finance**, *Université de Paris*.
- Fall 2019 **Lecture and Exercises for Machine Learning in Finance (Master/PhD)**, *Vienna University of Economics and Business*.
- Spring 2019 **Lecture on Continuous Time Finance I**, *Vienna University of Economics and Business*.
- Fall 2018 **Lecture and Exercises on Mathematical Finance in discrete time**, *University of Vienna*.
- Spring 2018 **Proseminar on Mathematical Finance in Continuous Time**, *University of Vienna*.
- Fall 2017 **Lecture on Stochastic Analysis**, *University of Vienna*.
- Fall 2017 **Exercises on Mathematical Finance in Discrete Time**, *University of Vienna*.
- Spring 2017 **Proseminar on Mathematical Finance in Continuous Time**, *University of Vienna*.
- Spring 2017 **Exercises on Probability Theory and Statistics**, *University of Vienna*.
- Spring 2016 **Lecture and Exercises on Mathematical Finance in Continuous Time**, *University of Vienna*.
- Fall 2015 **Lecture and Exercises on Mathematical Finance in Discrete Time**, *University of Vienna*.
- Spring 2015 **Exercises on Mathematical Finance in Continuous Time**, *University of Vienna*.



- Fall 2014 **Exercises on Mathematical Finance in Discrete Time**, *University of Vienna*.
- Spring 2014 **Lecture on Mathematical Finance (discrete time)**, *Vienna University of Technology*.
- Fall 2013 **Lecture on Interest Rate Theory**, *Vienna University of Technology*.
- Fall 2013 **Exercises on Life Insurance Mathematics**, *Vienna University of Technology*.
- Spring 2013 **Exercises on Mathematical Finance: Continuous Time Models**, *Vienna University of Technology*.
- Spring 2013 **Exercises on Mathematical Finance in Continuous Time**, *University of Vienna*.
- Fall 2012 **Exercises on Mathematical Finance in Discrete Time**, *University of Vienna*.
- Spring 2011 **Exercises on Brownian Motion and Stochastic Calculus**, *ETH Zürich*.
- Fall 2010 **Exercises on Probability Theory**, *ETH Zürich*.
- Spring 2010 **Exercises on Probability Theory and Statistics**, *ETH Zürich*.
- Fall 2009 **Exercises on Mathematical Finance**, *ETH Zürich*.

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## Current Ph.D and Post Doc Supervision

- Benedict Bauer Ph.D student since May 2020, co-supervision with Stefan Gerhold at TU Vienna
- Eva Flonner Ph.D student since October 2020, co-supervision with Zehra Eksi at WU Vienna
- Guido Gazzani Ph.D student since October 2019, co-supervision with Irene Klein at the University of Vienna
- Florian Huber Post Doc since April 2021
- Janka Möller Ph.D student since March 2020
- Francesca Primavera Ph.D student since October 2020

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## Completed Ph.D and Post Doc Supervision

- Stefan Rigger Ph.D student, Thesis title: “Probabilistic solutions of the supercooled Stefan problem”, Defense July 2022
- Francesco Guida Ph.D student, Thesis title: “Measure-valued affine and polynomial diffusions and applications to energy modeling”, Defense March 2022, co-supervision with Luca di Persio at the University of Verona
- Tonio Möllmann Ph.D student, Thesis title: “Generalized Feller processes and their applications to affine and polynomial processes”, Defense January 2022, co-supervision with Josef Teichmann at the Scuola Normale Superiore in Pisa
- Sara Svaluto-Ferro Post Doc from March 2018 to October 2021, now Assistant Professor at the University of Verona

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## Master and Bachelor thesis (Co)-Supervision

- Fatjon Abdiu *The effect of inclusion and exclusion in and from the German midcap index (MDAX) on stock's returns*, Master thesis, University of Vienna, 2022

- Hanae Miura *Deep Hedging in Python*, Bachelor thesis, University of Vienna, 2022
- Chi Yung Li *The martingale method in trinomial market models*, Bachelor thesis, University of Vienna, 2022
- Julia Glitzner *Derivative pricing in incomplete markets*, Bachelor thesis, University of Vienna, 2021
- Agnes Leonardsberger *Donsker's approximation theorem*, Bachelor thesis, University of Vienna, 2022
- Raphael Fabsits *Pricing American options in incomplete markets*, Bachelor thesis, University of Vienna, 2021
- Jakob Steininger *Deep reinforcement learning for portfolio optimization*, Master thesis, WU Vienna, 2020
- Eva Flonner *Rough covariance estimation - a neural network approach*, Master thesis, WU Vienna, 2020
- Andreas Celary *Rough volatility in Bitcoin markets*, Master thesis, University of Vienna 2019
- Anela Jahic *Volatility forecasting with neural networks*, Master thesis, University of Vienna 2019
- Sabrina Kellner *Machine Learning in Market Risk Management*, MBA thesis, Vienna University of Economics and Business, 2019
- Lukas Anzeletti *Ray-Knight Theorems*, Bachelor thesis, University of Vienna 2018
- Michele Giordano *Affine Volterra processes with jumps*, Master thesis, University of Pisa 2018
- Dorothea Zvonarich *American options*, Bachelor thesis, University of Vienna 2018
- Jasmin Riegler *Swaption Pricing with a Linear-Rational Term Structure Model*, Master thesis, University of Vienna 2017
- Mark Ballandies and Simon Hurwitz *Rough fractional stochastic volatility models*, Master thesis, ETH Zürich 2017
- Tobias Klocker *Online Portfolio selection*, Bachelor thesis, University of Vienna 2017
- Sarina Kohlfürst *Riskmanagement and Value at Risk*, Bachelor thesis, University of Vienna 2017
- Tobias Salzer *Topics in Ruin Theory*, Bachelor thesis, University of Vienna, 2017
- Matthäus Geiger *The Arbitrage Pricing Model*, Master thesis, University of Vienna and ETH Zürich, 2016
- Lisa Neitzel *Optionen und Martingale und deren Integration in einem anwendungsbezogenen Mathematikunterricht*, Master Thesis, University of Vienna, 2014
- Laura-Maria Orth *The multidimensional Heston stochastic volatility model*, Master thesis, Vienna University of Technology, 2014
- Sabine Polzer *Modellierung von Elektrizitäts-Forwardpreisen*, Master thesis, Vienna University of Technology, 2014
- Ev Bretschneider *Das Binomialmodell zur Bewertung von Optionen*, Bachelor thesis, University of Vienna, 2012
- Judith Mühlböck *Das Black-Scholes-Modell, implizite Volatilität und die Monte Carlo Methode*, Bachelor thesis, University of Vienna, 2012
- Alessandro Gnoatto *Yield curve shapes for affine processes on positive definite matrices*, Master thesis, ETH Zürich, 2011

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## Mentoring activity

- July 2017 Financial Mathematics Team Challenge, Project with 4 students on “Calibration with neural networks”, University of Cape Town
- July 2016 Financial Mathematics Team Challenge, Project with 4 students on “Calibration of polynomial market weights models”, University of Cape Town

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## Publications (peer-reviewed)

- (23) C. Cuchiero, S. Rigger, S. Svaluto-Ferro, *Propagation of minimality in the supercooled Stefan problem*, To appear in *The Annals of Applied Probability*, 2022, <https://arxiv.org/abs/2010.03580>
- (22) E. Abi Jaber, C. Cuchiero, M. Larsson and S. Pulido, *A weak solution theory for stochastic Volterra equations of convolution type*, *The Annals of Applied Probability*, 3(6):2924–2952, 2021, <https://arxiv.org/abs/1909.01166>
- (21) C. Cuchiero and S. Svaluto-Ferro, *Infinite dimensional polynomial processes*, *Finance and Stochastics* 25(9):1-44, 2021, <https://arxiv.org/abs/1911.02614>
- (20) C. Cuchiero, L. Gonon, L. Grigoryeva, J.-P. Ortega and J. Teichmann, *Discrete-Time Signatures and Randomness in Reservoir Computing*, *IEEE Transactions on Neural Networks and Learning Systems*, 2021, <https://arxiv.org/abs/2010.14615>
- (19) C. Cuchiero, W. Khosrawi and J. Teichmann, *A generative adversarial network approach to calibration of local stochastic volatility models*, *Risk* 2020, <https://arxiv.org/abs/2005.02505>
- (18) C. Cuchiero, M. Larsson and J. Teichmann, *Deep neural networks, generic universal interpolation, and controlled ODEs*, *SIAM Journal on Mathematics of Data Science*, 2(3):901–919, 2020, <https://arxiv.org/abs/1908.07838>
- (17) C. Cuchiero and J. Teichmann, *Generalized Feller processes and Markovian lifts of stochastic Volterra processes: the affine case*, *Journal of Evolution Equations*, 1–48, 2020, <https://doi.org/10.1007/s00028-020-00557-2>, <https://arxiv.org/abs/1804.10450>
- (16) C. Cuchiero and J. Teichmann, *Markovian lifts of positive semidefinite affine Volterra type processes*, *Decisions in Economics and Finance*, 42(2):407–448, 2019, <https://arxiv.org/abs/1907.01917>
- (15) C. Cuchiero, M. Larsson and S. Svaluto-Ferro, *Probability measure-valued polynomial diffusions*, *Electronic Journal of Probability*, 24, 2019, <https://arxiv.org/abs/1807.03229>
- (14) C. Cuchiero, I. Klein, J. Josef Teichmann, *A fundamental theorem of asset pricing for continuous time large financial markets in a two filtration setting*, to appear in *Theory of Probability and its applications*, 2019, <https://arxiv.org/abs/1705.02087>
- (13) C. Cuchiero, *Polynomial processes in stochastic portfolio theory*, *Stochastic processes and their applications*, 129(5):1829-1872, 2019, <https://arxiv.org/abs/1705.03647>
- (12) C. Cuchiero, M. Larsson and S. Svaluto-Ferro, *Polynomial jump-diffusions on the unit simplex*, *Annals of Applied Probability*, 28(4):2451-2500, 2018, <http://arxiv.org/abs/1612.04266v1>

- (11) C. Cuchiero, W. Schachermayer and L. Wong, *Cover's universal portfolio, stochastic portfolio theory and the numéraire portfolio*, Mathematical Finance, 29(3):773–803, 2019, <http://arxiv.org/abs/1611.09631v1>
- (10) C. Cuchiero, C. Fontana and A. Gnoatto, *Affine multiple yield curve models*, Mathematical Finance, 29(2):568–611, 2019, <http://arxiv.org/pdf/1603.00527v1.pdf>
- (9) C. Cuchiero, I. Klein and J. Teichmann, *A new perspective on the fundamental theorem of asset pricing for large financial markets*, Theory of Probability and its Applications, 60(4):561–579, 2016, <http://arxiv.org/pdf/1412.7562v1.pdf>
- (8) C. Cuchiero, C. Fontana and A. Gnoatto, *A general HJM framework for multiple yield curve modeling*, Finance and Stochastics, 20(2):267–320, 2016, <http://arxiv.org/pdf/1406.4301.pdf>
- (7) C. Cuchiero and J. Teichmann, *A convergence result for the Emery topology and a variant of the proof of the fundamental theorem of asset pricing*, Finance and Stochastics, 19(4): 743–761, 2015, <http://arxiv.org/pdf/1406.5414.pdf>
- (6) C. Cuchiero and J. Teichmann, *Fourier transform methods for pathwise covariance estimation in the presence of jumps*, Stochastic processes and their applications, 125(1):116–160, 2015, <http://arxiv.org/pdf/1301.3602.pdf>
- (5) C. Cuchiero, M. Keller-Ressel, E. Mayerhofer and J. Teichmann, *Affine processes on symmetric cones*, Journal of Theoretical Probability, 2014, <http://arxiv.org/pdf/1112.1233v1.pdf>
- (4) C. Cuchiero and J. Teichmann, *Path properties and regularity of affine processes on general state spaces*, Séminaire de Probabilités XLV, 2013, <http://arxiv.org/pdf/1107.1607v2.pdf>
- (3) C. Cuchiero, M. Keller-Ressel and J. Teichmann, *Polynomial processes and their applications to mathematical finance*, Finance and Stochastics, 16(4):711–740, 2012, <http://arxiv.org/pdf/0812.4740v2.pdf>
- (2) C. Cuchiero, D. Filipović, E. Mayerhofer and J. Teichmann, *Affine processes on positive semidefinite matrices*, Annals of Applied Probability, 21(2):397–463, 2011, <http://arxiv.org/pdf/0910.0137v3.pdf>
- (1) C. Cuchiero, D. Filipović and J. Teichmann, *Affine Models*, Encyclopedia of Quantitative Finance, 2010, <http://arxiv.org/pdf/0809.1985v2.pdf>

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## Other publications

- (24) C. Cuchiero, *Universal structures in Mathematical Finance*, Internationale Mathematische Nachrichten, 08/2020

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## Preprints

- (32) C. Cuchiero, L. Di Persio, F. Guida and Sara Svaluto-Ferro, *Measure-valued processes for energy markets*, 2022, Preprint, <https://arxiv.org/abs/2210.09331>

- (31) C. Cuchiero, F. Primavera and S. Svaluto-Ferro, *Universal approximation theorems for continuous functions of càdlàg paths and Lévy-type signature models*, 2022, Preprint, <https://arxiv.org/abs/2208.02293>
- (30) C. Cuchiero, G. Gazzani and S. Svaluto-Ferro, *Signature based models: theory and calibration*, 2022, Preprint, <https://arxiv.org/abs/2207.13136>
- (29) C. Cuchiero, C. Reisinger, S. Rigger, *Implicit and fully discrete approximation of the supercooled Stefan problem in the presence of blow-ups*, 2022, Preprint, <https://arxiv.org/abs/2206.14641>
- (28) C. Cuchiero, G. Gazzani, I. Klein, *Risk measures under model uncertainty: a Bayesian viewpoint*, 2022, Preprint, <https://arxiv.org/abs/2204.07115>
- (27) C. Cuchiero, L. Di Persio, F. Guida, and S. Svaluto-Ferro, *Measure-valued affine and polynomial diffusions*, 2021, Preprint, <https://arxiv.org/abs/2112.15129>
- (26) C. Cuchiero, C. Reisinger, and S. Rigger, *Optimal bailout strategies resulting from the drift controlled supercooled Stefan problem*, 2021, Preprint, <https://arxiv.org/abs/2111.01783>
- (25) A. Allan, C. Cuchiero, C. Liu and D. Prömel, *Model-free portfolio theory: A rough path approach*, 2021, Preprint, <https://arxiv.org/abs/2109.01843>

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## Working Papers

- (40) C. Cuchiero and F. Huber, *Polynomial interacting particle systems and non-linear SPDEs for capitalization curves*, Working paper, 2022
- (39) C. Cuchiero, L. Gonon, L. Grigoryeva, J.-P. Ortega and J. Teichmann, *Approximation of dynamics by randomized signature*, Working paper, 2022
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- (34) S. Cox, C. Cuchiero and A. Khedher, *Operator valued Wishart processes*, Working paper, 2022
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## Habilitation and Ph.D.

Habilitation Thesis	High dimensional finance beyond classical paradigms - multiple yield curves, robust calibration and model-free portfolio selection
Ph.D. Thesis	Affine and polynomial processes <a href="http://e-collection.library.ethz.ch/eserv/eth:4629/eth-4629-02.pdf">http://e-collection.library.ethz.ch/eserv/eth:4629/eth-4629-02.pdf</a>