Martin Herdegen — Curriculum Vitae

Department of Mathematics
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Personal data

Born on April 10, 1986 in München, German citizen, married.

Education

PhD in Mathematics under the supervision of Martin Schweizer, ETH Zürich, Jul 2014.

MSc in Mathematical Sciences under the supervision of Andreas Kyprianou, University of Bath, Dec 2009.

Vordiplom in Wirtschaftsmathematik, LMU München, Apr 2008.

Abitur, Franz-Ludwig Gymnasium Bamberg, Jul 2005.

Employment

Professor of Financial Mathematics, University of Stuttgart, from Feb 2025.

Reader in Financial Mathematics, University of Warwick, since Aug 2023 (reduced to 10% from Feb 2025).

Associate Professor of Financial Mathematics (with tenure), University of Warwick, Aug 2020 to Jul 2023.

Assistant Professor of Financial Mathematics (tenure-track), University of Warwick, Sep 2016 to Jul 2020.

Postdoctoral research fellow (SNF), ETH Zürich, Sep 2014 to Aug 2016.

Teaching assistant in Mathematics, ETH Zürich, Nov 2010 to Aug 2014.

Graduate teaching assistant in Mathematics, University of Bath, Sep 2008 to Apr 2009.

Teaching assistant in Mathematics, Universität München, Apr 2008 to Jul 2008.

Zivildienst, Jul 2005 to Mar 2006.

Research interests

Mathematical Finance: equilibrium theory (with and without frictions), utility maximisation (with frictions), stochastic differential utility, risk measures, ρ-arbitrage, financial bubbles, market making, decentralised finance, rough volatility

Probability Theory: stochastic optimal control, (forward-)backward stochastic differential equations, strict local martingales, stochastic processes with jumps, weak and vague convergence of measures

Scholarships

Max-Weber Programm (scholarship for the best students of Bavaria, Germany), Apr 2006 to Sep 2009.

Studienstiftung des Deutschen Volkes (scholarship for the best students of Germany), Dec 2006 to Sep 2009.

DAAD (European Excellence Program for study abroad year in the UK), Sep 2008 to Sep 2009.

Preprints

Competition between DEX through Dynamic Fees (with Leonardo Baggiani, Leandro Sánchez-Betancourt), 2026

The Interplay between Utility and Risk in Portfolio Selection (with Leonardo Baggiani, Nazem Khan), 2025

Optimal Investment and Consumption in a Stochastic Factor Model (with Florian Gutekunst, David Hobson), 2025

Optimal Dynamic Fees in Automated Market Makers (with Leonardo Baggiani, Leandro Sánchez-Betancourt), 2025

How to Reduce Risk by Increasing Risk (with Cosimo Munari, Nazem Khan), 2025

A Stability Result for Quadratic BSDEs with BMO Growth at the Origin (with Nikolaos Constaninou, Christoph Czichowsky, David Martins), 2025

Existence and Uniqueness of Quadratic and Linear Mean-Variance Equilibria in General Semimartingale Markets (with Christoph Czichowsky, David Martins), 2024

Risk, Utility and Sensitivity to Large losses (with Cosimo Munari, Nazem Khan), 2024.

Publications

Portfolio Optimisation under Transaction Costs with Recursive Preferences (with David Hobson, Alex Tse), Trans. AMS, to appear, 2026

Market Making with Exogenous Competition (with Robert Boyce, Leandro Sánchez-Betancourt), SIAM J. Financial Math., **16(2)**, 692-706, 2025

Proper Solutions for Epstein-Zin Stochastic Differential Utility (with David Hobson, Joseph Jerome), Finance Stoch., **29**, 885-932, 2025.

ρ-Arbitrage and ρ-Consistent Pricing for Star-shaped Risk Measures (with Nazem Khan), Math. Oper. Research, **50(2)**, 1555-1583, 2024

An Elementary Proof of the Dual Representation of Expected Shortfall (with Cosimo Munari), Math. Fin. Econ., **17**, 655–662, 2023

Mbt-gym: Reinforcement Learning for Model-based Limit Order Book Trading (with Joe Jerome, Leandro Sánchez-Betancourt, Rahul Savani), Proceedings of the Fourth ACM International Conference on AI in Finance, 619–627, 2023

Liquidity Provision with Adverse Selection and Inventory Costs (with Johannes Muhle-Karbe, Florian Stebegg), Math. Oper. Research, **48**, 1286-1315, 2023

The Infinite Horizon Investment-Consumption Problem for Epstein-Zin Stochastic Differential Utility II: Existence, Uniqueness and Verification for $\vartheta \in (0,1)$ (with David Hobson, Joseph Jerome), Finance Stoch., **27**, 159–188, 2023.

The Infinite Horizon Investment-Consumption Problem for Epstein-Zin Stochastic Differential Utility I: Foundations (with David Hobson, Joseph Jerome), Finance Stoch., **27**, 127–158, 2023

Bubbles in discrete time models (with Dörte Kreher), Finance Stoch., **26**, 899-925, 2022.

Mean-ρ portfolio selection and ρ-arbitrage for coherent risk measures (with Nazem Khan), Math. Finance, **32**, 226-272, 2022.

An Elementary Approach to the Merton Problem (with David Hobson, Joseph Jerome), Math. Finance, **31**, 1218-1239, 2021.

Equilibrium Asset Pricing with Transaction Costs (with Johannes Muhle-Karbe, Dylan Possamaï), Finance Stoch., **25**, 231-275, 2021

Trading with small nonlinear price impact (with Thomas Cayé, Johannes Muhle-Karbe), Ann. Appl. Probab., **30**, 706-746, 2020.

Scaling Limits of Processes with Fast Nonlinear Mean Reversion (with Thomas Cayé, Johannes Muhle-Karbe), Stoch. Proc. Appl., **130**, 1994-2031, 2020.

Sensitivity of Optimal Consumption Streams (with Johannes Muhle-Karbe), Stoch. Proc. Appl., **129**, 1964-1992, 2019.

Strict Local Martingales and Optimal Investment in a Black-Scholes Model with a Bubble (with Sebastian Herrmann), Math. Finance, **29**, 285-328, 2019.

Equilibrium Returns with Transaction Costs (with Bruno Bouchard, Masaaki Fukawawa, Johannes Muhle-Karbe), Finance Stoch., **22**, 569–601, 2018.

Stability of Radner Equilibria with Respect to Small Frictions (with Johannes Muhle-Karbe), Finance Stoch., **22**, 443–502, 2018.

Semi-Efficient Valuations and Put-call Parity (with Martin Schweizer), Math. Finance, **28**, 1061–1106, 2018.

No-arbitrage in a Numéraire-independent Modeling Framework, Math. Finance, **27**, 568-603, 2017.

Minimal Conditions for Implications of Gronwall-Bellman Type (with Sebastian Herrmann), J. Math. Anal. Appl., **446**, 1654–1665, 2017.

Strong Bubbles and Strict Local Martingales (with Martin Schweizer), Int. J. Theor. Appl. Finance, **19**, 2016.

Single Jump Processes and Strict Local Martingales (with Sebastian Herrmann), Stoch. Proc. App., **126**, 337-359, 2016.

Numéraire-independent Modelling of Financial Markets, Ph.D. Thesis ETH Zurich, Diss. ETH No. 22018, 2014.

Working papers

A Continuity Theorem for Generalised Signed Measures with an Application to Karamata's Tauberian Theorem (with Gechun Liang, Osian Shelley), 2023.

Vague and Weak Convergence for Signed Measures (with Gechun Liang, Osian Shelley), 2023.

When is Recursive Utility Well Founded? (with David Hobson, Joseph Jerome), 2022.

A Dual Characterisation of Regulatory Arbitrage for Expected Shortfall (with Nazem Khan), Working Paper, 2019.

A Class of Strict Local Martingales (with Sebastian Herrmann), Swiss Finance Institute Research Paper No. 14-18, 2014.

A Numéraire Independent Modelling Framework for Financial Markets, NCCR FINRISK working paper No. 741, ETH Zurich, 2012.

Talks at research seminars and conferences (* invited)

Stochastic Finance seminar (*), University of Warwick (UK), Feb 2026.

OMI seminar (*), University of Oxford (UK), Feb 2026.

Mathematical Finance seminar (*), King's College London (UK), Feb 2026.

Mathematical Finance seminar (*), Bielefeld (Germany), Dec 2025.

Bachelier Seminar (*), Paris (France), Nov 2025.

Workshop on Algo-trading & DeFi (*plenary), Milan (Italy), Oct 2025.

Workshop on Frontiers in DeFi (*), Berlin (Germany), Sept 2025.

12th AMaMeF conference, Verona (Italy), Jun 2025.

CRISM 2.0 conference (*), University of Warwick (UK), May 2025.

ASFM seminar (*), University of Amsterdam (Netherlands), May 2024.

Stochastic Optimal Control in Economics, Finance and Learning Theory (*), ETH Zürich (Switzerland), Jun 2023.

Mathematical Finance seminar (*), Dublin City University (Ireland), May 2023.

Berlin Probability Colloqium (*), TU Berlin (Germany), Apr 2023.

Mathematical Finance seminar (*), King's College London (UK), Mar 2023.

Probability seminar (*), University of Manchester (UK), Mar 2023.

Mathematics and Financial Economics: Many Player Games and Applications (*), Berlin (Germany), Aug 2022.

Finance and Stochastics seminar (*), Imperial College (UK), Jun 2022.

15th German Probability and Statistics Days (online), (*), Mannheim (Germany), Sep 2021.

10th AMaMeF conference (online) (*), Padova (Italy), Jun 2021.

Financial Mathematics/Engineering Seminar (online) (*), PolyU HK (Hong Kong), Mar 2021.

Financial and Insurance Mathematics seminar (*), ETH Zürich (Switzerland), Feb 2020.

Probability and Financial Mathematics seminar (*), Leeds (UK), Feb 2020.

9th AMaMeF conference, Paris (France), Jun 2019.

Fudan-Warwick Spring School on Financial Mathematics and Stochastic Analysis, 8 lectures (*), Shanghai (China), April 2019.

CFF Seminar (*), Carnegie Mellon University (US), Sept 2018.

Financial Mathematics Seminar (*), University of Michigan (US), Sept 2018.

10th World Congress of the Bachelier Finance Society, Dublin (Ireland), Jul 2018.

Mathematical Finance seminar (*), Dublin City University (Ireland), Apr 2018.

13th German Probability and Statistics Days, Freiburg (Germany), Feb 2018.

Stochastic Analysis and Financial Mathematics seminar (*), HU Berlin (Germany), Dec 2017.

London Mathematical Finance seminar (*), King's College London (UK), Oct 2017.

8th AMaMeF conference (*), Amsterdam (Netherlands), June 2017.

Mathematical and Computational Finance seminar (*), Oxford University (UK), May 2017.

Financial Mathematics Seminar (*), University of Michigan (US), Apr 2017.

Stochastic Models and Control Workshop, Trier (Germany), Mar 2017.

Finance and Stochastics seminar (*), Imperial College (UK), Mar 2017.

Financial Mathematics seminar (*), University of Michigan (US), Mar 2016.

CFF Seminar (*), Carnegie Mellon University (US), Mar 2016.

Stochastik Tage, Bochum (Germany), Mar 2016.

Vienna Seminar in Mathematical Finance and Probability (*), TU Wien (Austria), Jan 2016.

Mathematisches Kolloquium (*), Universität Freiburg (Germany), Nov 2015.

Methods of Mathematical Finance – in honor of Steve Shreve's 65th birthday (poster), Pittsburgh (US), Jun 2015.

Joint Risk and Stochastics and Financial Mathematics Seminar Series (*), LSE (UK), May 2015.

Research Seminar in Mathematical Finance (*), TU Kaiserslautern (Germany), May 2015.

Research Seminar on Stochastic Analysis and Stochastic Finance (*), TU Berlin (Germany), Apr 2015.

Seminar on Advances in Computational Economics and Finance (*), Universität Zürich (Switzerland), Apr 2015.

Oberseminar Finanzmathematik und Numerik (*), Universität Kiel (Germany), Nov 2014.

8th World Congress of the Bachelier Finance Society, Bruxelles (Belgium), Jun 2014.

2nd Imperial-ETH Workshop on Mathematical Finance, ETH Zürich (Switzerland), Apr 2014.

8th Bachelier Colloquium, Métabief (France), Jan 2014.

ETH Risk Day (*), Zürich (Switzerland), Sep 2013.

1st Imperial-ETH Workshop on Mathematical Finance, Imperial College London (UK), Mar 2013.

4th Workshop on Mathematical Finance for Young Researchers, Berlin (Germany), Oct 2012.

12th Swiss Doctoral Workshop in Finance, Gerzensee (Switzerland), Jun 2012.

6th Bachelier Colloquium, Métabief (France), Jan 2012.

Teaching experience

Statistik für Wirtschaftswissenschaftler, lecture, Bachelor, University of Stuttgart, SS 2026

Financial Mathematics 2, lecture, Master, University of Stuttgart, SS 2026

Financial Mathematics 1, lecture, Master, University of Stuttgart, WS 2025/2026

Stochastic Processees 1, lecture, Bachelor, University of Stuttgart, WS 2025/2026

Risk measures, Haupt- and Master seminar, University of Stuttgart, SS 2025

Maß- und Wahrscheinlichkeitstheory, lecture, Bachelor, University of Stuttgart, SS 2025

Backward Stochastic Differential Equations with Applications to Mathematical Finance, lecture, PhD, University of Warwick, Term 2, 2024

Advanced trading strategies, lecture, Master, University of Warwick, Term 2, 2022

Stochastic Calculus for Finance, lecture, Master, University of Warwick, Term 1, 2020-2024

Probability and Stochastic Processes, lecture, Master, University of Warwick, Term 1, 2018-2019

Advanced Topics in Mathematical Finance, lecture, Master, University of Warwick, Term 2, 2018-2020

Reading group in Mathematical Finance, seminar, PhD, University of Warwick, Terms 1 - 3, 2016-2019, 2020-2022

Introduction to Mathematical Finance, lecture, Bachelor, University of Warwick, Term 1, 2016-2019

Equilibrium Models in Financial Economics, lecture, Master, ETH Zürich, HS 2015

Brownian Motion and Stochastic Calculus, exercise class, Master, ETH Zürich, FS 2014.

Probability Theory, exercise class, Master, ETH Zürich, HS 2013.

Mathematical Finance, exercise class and problem sets, Master, ETH Zürich, HS 2012.

Mathematical Foundations for Finance, exercise class and problem sets, Master, ETH Zürich, HS 2011.

Applied Stochastic Processes, exercise class and problem sets, Master, ETH Zürich, FS 2011.

Mathematical Foundations for Finance, exercise class and problem sets, Master, ETH Zürich, HS 2010.

Probabiliy and Statistics II, exercise class, Bachelor, University of Bath, Spring 2009.

Functions and Differentiation, exercise class, Bachelor, University of Bath, Fall 2008.

Wahrscheinlichkeitstheorie, exercise class, Hauptdiplom, LMU München, SS 2008.

Postdocs

Nazem Khan, Apr 2022 - Dec 2022.

PhD students

Jack Kerr, since Sept 2025.

Nathan Sonn, since Mar 2025.

Florian Gutekunst (with David Hobson), since Oct 2024.

Andreea Popescu, since Oct 2023.

Leonardo Baggiani, since Oct 2022.

Nikolaos Constantinou, since Oct 2021.

Osian Shelley (with Gechun Liang), Oct 2019 - May 2023.

Nazem Khan, Oct 2018 - Mar 2022.

Joseph Jerome (with David Hobson), Oct 2017 - Sep 2021.

Supervised Master (and Bachelor) theses

2024: Xinyu Chen.

2023: Robert Boyce, Zain Kakujee, Andreea Popescu, Jacob Rudefalk.

2022: Alban Cena, Nikil Kanabar, Oscar Spevack, Henry Xiong.

2021: Trinnhalden Brisley, Nikolaos Constaninou, Christopher Jennings, Rohan Nuckchady.

2020: Yik Ming Chow, Nikolas Michael, Neel Sachania, Niraj Shah,

2019: Alex Chatfield, Callum Holmes, Ujwal Thapa, Joseph Tilley, Haoyu Zhang.

2018: Nazem Khan, Riqui Liu, Jay Vyas.

2017: Eleanor Davidson.

2016: Sandro Flury (with Martin Larson).

2015: Mathias Mauchle (with Johannes Muhle-Karbe, Bachelor), Meta-Lina Spohn (with Johannes Muhle-Karbe, Bachelor).

Teaching qualifications/awards

Award for the best Pflichtvorlesung of the academic year in the Department of Mathematics at the University of Stuttgart, Jul 2025.

Commendation for high-quality teaching by the Student-Staff Liaison Committee (SSLC) of the Statistics Department at the University of Warwick, Feb 2020.

Fellow of the Higher Education Academy (HEA), Jan 2018.

Professional duties

Conference organisation: part of the organising committee of the London/Oxford/Warwick Financial Mathematics workshop series, since Jan 2022; local organiser of the Warwick workshop in Apr 2022.

Editorial service: Associate Editor for Math. Fin. Econ, since Jan 2022.

Referee service: Ann. Appl. Probab., Bernoulli J., J. Bank. Finance, Finance Stoch., Int. J. Theor. Appl. Finance, Math. Finance, Math. Fin. Econ., Mod. Stoch. Theory Appl., Quant. Finance, Risks, SIAM J. Control Optim., Stoch. Proc. Appl., anniversary publications.

Administrative duties

Equal opportunity officer of Faculty 8 Mathematics and Physics at Stuttgart, since Oct 2025.

Postgraduate admission officer for the MSc in Statistics at Warwick, Sep 2023 - Jan 2025.

Course director for the MORSE degree at Warwick (about 500 students), Sep 2020 - Dec 2022.

Deputy course director for the MORSE degree at Warwick (about 500 students), Sep 2019 - Aug 2020.

Working group for the restructuring of the MSc Mathematical Finance at Warwick, Oct 2018 - Jun 2019.

Organisation of the Stochastic Finance @ Warwick Seminar, Jan 2017 - Jun 2018, Oct 2021 - Dec 2022.

Organisation of the (internal) Post/Doctoral seminar in Mathematical Finance at ETH Zürich, Feb 2011 to Dec 2013.

Organisation of the interdisciplinary (internal) Fin&Math Doc seminar between Universität Zürich and ETH Zürich, Oct 2012 to Dec 2013.

Language skills

German mother tongue.

English fluent.

French very good.

Spanish basic.

Voluntary work

Coordinator of the European Association of Christian Postgraduate Groups, since Apr 2020.

Chair of the Christian Postgraduate and Staff Network, Warwick, Jan 2017 - Aug 2020.

Voluntary staff member of the non-profit organisation VBG Switzerland, Sep 2014 to Aug 2016.

Member of the board of the Christian University Society VBG Zürich, Jun 2010 to Oct 2013.

References

Prof. Dr. David Hobson, University of Warwick, Department of Statistics, Coventry, CV4 7AL, United Kingdom, *e-mail*: `d.hobson@warwick.ac.uk`

Prof. Dr. Johannes Muhle-Karbe, Imperial College London, Department of Mathematics, London, SW7 1NE, United Kingdom, *e-mail*: `j.muhle-karbe@imperial.ac.uk`

Prof. Dr. Martin Schweizer, Departement Mathematik, ETH Zürich, Rämistrasse 101, CH-8092 Zürich, Switzerland, *e-mail*: `martin.schweizer@math.ethz.ch`

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