

Curriculum Vitae

Prof. Dr. Christoph Belak

Technische Universität Berlin
Faculty II – Mathematics and Natural Sciences
Institute of Mathematics
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Personal Details

Name **Christoph Belak**
 Address An der Maeswiese 12
 54296 Trier, Germany
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 Website <http://belak.ch/>
 Date of Birth 22.01.1987 in Mainz, Germany

Education

03/2015 **PhD in Mathematics**, University of Kaiserslautern
 Thesis: *Worst-Case Portfolio Optimization: Transaction Costs and Bubbles*
 Supervisors: Jörn Sass, Olaf Menkens
 Referees: Jörn Sass, Mogens Steffensen
 Grade: summa cum laude
 05/2011 **Diplom in Mathematics**, University of Kaiserslautern
 Grade: 1.1
 03/2006 **Abitur**, Bischöfliches Willigis Gymnasium, Mainz
 Grade: 1.7

Scientific Career

Since 04/2019 **Junior Professor**, Technische Universität Berlin
Stochastics and Quantitative Financial Mathematics
 10/2015 – 03/2019 **Postdoctoral Fellow**, University of Trier
 in the *Stochastic Processes* group (Frank Seifried)
 02/2018 – 04/2018 **Center for Computational Finance Junior Fellow**, Carnegie Mellon University
 2 months, invited by Johannes Muhle-Karbe
 04/2015 – 09/2015 **Postdoctoral Fellow**, University of Kaiserslautern
 in the *Stochastic Control and Financial Mathematics* group (Ralf Korn)
 10/2011 – 03/2015 **PhD Student** (Scholarship), University of Kaiserslautern
 Supervisor: Jörn Sass
 10/2011 – 09/2013 **PhD Student** (Scholarship), Dublin City University
 Joint PhD Program with University of Kaiserslautern
 Supervisor: Olaf Menkens
 10/2013 – 03/2015 **Teaching Assistant**, University of Kaiserslautern
 04/2012 – 09/2012 **Teaching Assistant**, University of Kaiserslautern
 10/2011 – 09/2013 **Teaching Assistant**, Dublin City University
 10/2010 – 03/2011 **Teaching Assistant**, University of Kaiserslautern
 05/2010 – 05/2011 **Research Assistant**, Fraunhofer-Institut for Industrial Mathematics (ITWM), Kaiserslautern

Prizes and Awards

- 09/2018 **Teaching Award of the University of Trier** (Nomination)
For lecture on *Stochastic Analysis and Mathematical Finance* held in the summer term 2018
- 01/2018 **Joseph A. Schumpeter Prize 2017**
German Central Bank and Department IV, University of Trier
For Publication: C. Belak, S. Christensen, O. Menkens: *Worst-Case Portfolio Optimization in a Market with Bubbles*, Int. J. Theor. Appl. Finance, Vol. 19, No. 2, 2016
- 04/2017 **Rhineland-Palatinate Award for Excellence in Teaching** (Nomination)
Institutes of Higher Education Evaluation Network South-West
- 06/2016 **Prize for Outstanding Scientific Achievements 2016**
Alumni Network of the University of Kaiserslautern
For PhD Thesis: *Worst-Case Portfolio Optimization: Transaction Costs and Bubbles*
- 04/2016 **Gauss Early Career Prize 2015**
German Society for Insurance and Financial Mathematics (DGVFM)
For PhD Thesis: *Worst-Case Portfolio Optimization: Transaction Costs and Bubbles*
- 10/2011 **Prize for Outstanding Diplom Thesis 2011**
Regional State Bank Baden-Wuerttemberg and Department of Mathematics, University of Kaiserslautern
For Diplom Thesis: *Worst-Case Portfolio Optimization with Proportional Transaction Costs*

Academic Service

- Referee** ▷ Applied Mathematics and Optimization
▷ Finance and Stochastics
▷ International Journal of Financial Studies
▷ Journal of Mathematical Analysis and Applications
▷ Mathematical Finance
▷ Mathematical Methods of Operations Research
▷ Mathematics and Financial Economics
▷ Mathematics of Operations Research
▷ Risks
▷ SIAM Journal on Control and Optimization
▷ SIAM Journal on Financial Mathematics
▷ Quantitative Finance
- Workshops** **Stochastic Models and Control Workshop 2017**, Trier
with Frank Seifried
Stochastic Models and Control Workshop 2015, Kaiserslautern
with Ralf Korn, Jörn Sass, Frank Seifried
- Committees** **Budget Committee**
Department IV, University of Trier, from 06/2017 to 03/2019
- Projects** **Mathematics Ambassadors**
Project to promote Mathematics Courses of the University of Trier in High Schools
- Memberships** German Society for Insurance and Financial Mathematics (DGVFM)

Thesis Supervision

- MSc Theses**
- ▷ The Stochastic Perron Method for Regime-Switching Models
 - ▷ Backward Stochastic Differential Equations and Malliavin Calculus
 - ▷ Optimal Consumption and Leisure Time
 - ▷ Optimal Investment with Indivisible Assets
 - ▷ Market Liquidity Modeling (Co-Supervision)
- BSc Theses**
- ▷ Optimal Stopping of Stochastic Processes in Discrete Time (Co-Supervision)
 - ▷ Portfolio Optimization in the Binomial Model with Indivisible Assets (Co-Supervision)

Thesis Referee

- MSc Theses**
- ▷ Extreme Value Theory, Generalized Pareto Processes and Liquidity Risk Modeling
 - ▷ Malliavin Calculus and Sensitivities
- BSc Theses**
- ▷ A Game-Theoretic Approach to Probability and Applications to Deviation Inequalities
 - ▷ Coherent Risk Measures and Duality
 - ▷ Fractional Brownian Motion and Stochastic Integrals
 - ▷ Optimal Stopping and Valuation of American Call Options
 - ▷ Terminal Wealth of Doob's Upcrossing Inequality

Invited Talks and Presentations

- 2019** ▷ Conference on Stochastic Modeling in Finance and Insurance, Bedlewo
- 2018** ▷ Mathematical Finance Seminar, TU Berlin
 - ▷ IFIP TC 7 Conference on System Modelling and Optimization, Essen
 - ▷ Symposium on Optimal Stopping, Houston
 - ▷ Center for Mathematical Economics, University of Bielefeld
 - ▷ Probability and Computational Finance Seminar, Carnegie Mellon University
 - ▷ Invited Lecture (Stochastic Perron's Method), Carnegie Mellon University
 - ▷ Financial/Actuarial Mathematics Seminar, University of Michigan
- 2017** ▷ Optimal Stopping in Complex Environments Workshop, Bielefeld
 - ▷ Joint Risk & Stochastics and Financial Mathematics Seminar, London School of Economics
 - ▷ 8th General AMaMeF Conference, Amsterdam
 - ▷ Byrne Young Researcher Workshop on Mathematical Finance, Ann Arbor
- 2016** ▷ Colloquium on Mathematical Statistics and Stochastic Processes, University of Hamburg
- 2014** ▷ Colloquium on Mathematical Statistics and Stochastic Processes, University of Hamburg
- 2011** ▷ Financial Mathematics Seminar, Dublin City University

Contributed Talks and Presentations

- 2019** ▷ 12th International Workshop on Stochastic Models and Control, Cottbus
- 2018** ▷ 10th Bachelier Finance Society World Congress, Dublin
- 2017** ▷ 11th Bachelier Colloquium, Métabief
- 2016** ▷ Vienna Congress on Mathematical Finance, Vienna
 - ▷ 9th Bachelier Finance Society World Congress, New York
 - ▷ Quantitative Finance QP++ Symposium, Trier
 - ▷ 12th German Probability and Statistics Days, Bochum
 - ▷ 10th Bachelier Colloquium, Métabief
- 2015** ▷ 9th Bachelier Colloquium, Métabief
- 2014** ▷ TU Munich & TU Kaiserslautern Research Seminar, Kaiserslautern
 - ▷ 11th German Probability and Statistics Days, Ulm
- 2013** ▷ International Workshop on Regime Switching Models in Finance, Kaiserslautern
 - ▷ TU Munich & TU Kaiserslautern Research Seminar, Bad Tölz
 - ▷ 6th European Summer School in Financial Mathematics, Vienna
 - ▷ 6th AMaMeF and Banach Center Conference, Warsaw
 - ▷ Frontiers in Financial Mathematics, Dublin
 - ▷ 7th Bachelier Colloquium, Métabief
- 2012** ▷ TU Munich & TU Kaiserslautern Research Seminar, Lambrecht
 - ▷ Optimal Stopping, Control and Finance Workshop, Warwick
 - ▷ 7th Bachelier Finance Society World Congress, Sydney
 - ▷ 10th German Probability and Statistics Days, Mainz
 - ▷ 6th Bachelier Colloquium, Métabief

Publications

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Publications in Peer-Reviewed Journals

- 2019 ▷ Utility Maximisation in a Factor Model with Constant and Proportional Transaction Costs (with Sören Christensen), *Finance and Stochastics*, Vol. 23, No. 1, pp. 29–96, 2019
- 2018 ▷ Backward Nonlinear Expectation Equations (with Thomas Seiferling and Frank Seifried), *Mathematics and Financial Economics*, Vol. 12, No. 1, pp. 111–134, 2018
- 2017 ▷ A General Verification Result for Stochastic Impulse Control Problems (with Sören Christensen and Frank Seifried), *SIAM Journal on Control and Optimization*, Vol. 55, No. 2, pp. 627–649, 2017
- 2016 ▷ Worst-Case Portfolio Optimization in a Market with Bubbles (with Sören Christensen and Olaf Menkens), *International Journal of Theoretical and Applied Finance*, Vol. 19, No. 2, 1650009 (36 pages), 2016
- 2015 ▷ On the Uniqueness of Unbounded Viscosity Solutions arising in an Optimal Terminal Wealth Problem with Transaction Costs (with Olaf Menkens and Jörn Sass), *SIAM Journal on Control and Optimization*, Vol. 53, No. 5, pp. 2878–2897, 2015
- 2015 ▷ Worst-Case Portfolio Optimization with Proportional Transaction Costs (with Olaf Menkens and Jörn Sass), *Stochastics: An International Journal of Probability and Stochastic Processes*, Vol. 87, No. 4, pp. 623–663, 2015
- 2014 ▷ Worst-Case Optimal Investment with a Random Number of Crashes (with Sören Christensen and Olaf Menkens), *Statistics & Probability Letters*, Vol. 90, pp. 140–148, 2014

PhD Thesis

- 2015 ▷ Worst-Case Portfolio Optimization: Transaction Costs and Bubbles, University of Kaiserslautern, 2015, available at <http://nbn-resolving.de/urn/resolver.pl?urn:nbn:de:hbz:386-kluedo-40450>

Preprints

- 2018 ▷ Optimal Trading with General Signals and Liquidation in Target Zone Models (with Johannes Muhle-Karbe and Kevin Ou), available at <https://ssrn.com/abstract=3224674>
- 2018 ▷ Finite-Horizon Optimal Investment with Transaction Costs: Construction of the Optimal Strategies (with Jörn Sass), available at <https://ssrn.com/abstract=2636341>
- 2017 ▷ Pricing Contingent Claims under Jump Uncertainty (with Olaf Menkens), available at <https://ssrn.com/abstract=2773231>

Teaching Portfolio

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Teaching Portfolio

Courses at Technische Universität Berlin

Course Name	Format	Semester	Load h/wk	Evaluation Scale: 1 to 6
The Filtering Problem and Portfolio Optimization under Partial Information	Seminar	Summer 19	2	upcoming

Courses at University of Trier

Course Name	Format	Semester	Load h/wk	Evaluation Scale: 1 to 6
Stochastic Analysis and Mathematical Finance with Frank Seifried	Lectures	Summer 19	4	upcoming
Finance C / Foundations of Mathematical Finance with Sebastian Geissel	Lectures	Winter 18	4	1.6
Stochastic Processes	Lectures	Winter 18	4	1.3
Stochastic Analysis and Mathematical Finance	Lectures	Summer 18	4	1.0
Stochastic Analysis and Mathematical Finance	Exercises	Summer 18	2	1.0
Stochastic Processes	Lectures	Winter 17	4	1.1
Stochastic Processes	Exercises	Winter 17	2	1.1
Lévy Processes	Seminar	Summer 17	2	1.0
Stochastic Analysis and Mathematical Finance	Exercises	Summer 17	2	—
Stochastic Analysis and Mathematical Finance	Tutorials	Summer 17	2	1.2
Stochastic Control and Optimization	Lectures	Winter 16	2	1.3
Stochastic Control and Optimization	Exercises	Winter 16	1	1.8
Stochastic Processes	Exercises	Winter 16	2	1.8
Stochastic Processes	Tutorials	Winter 16	2	1.8
Stochastic Analysis and Mathematical Finance	Exercises	Summer 16	2	1.8
Stochastic Analysis and Mathematical Finance	Tutorials	Summer 16	2	1.8
Interest Rate and Credit Risk Models	Exercises	Summer 16	1	—
Interest Rate and Credit Risk Models	Tutorials	Summer 16	1	—
Stochastic Processes	Exercises	Winter 15	2	1.5
Stochastic Processes	Tutorials	Winter 15	2	1.5

Courses at University of Kaiserslautern

Course Name	Format	Semester	Load h/wk	Evaluation Scale: -2 to 2
Financial Mathematics I	Exercises	Summer 15	2	2.0
PhD Seminar	Seminar	Summer 15	2	—
Interest Rate Theory with Frank Seifried	Lectures	Winter 14	2	1.7
Stochastic Methods	Lab	Winter 14	2	1.3
Continuous-Time Portfolio Optimization with Jörn Sass	Lectures	Summer 14	2	—
Nonlinear Expectations with Frank Seifried and Jörn Sass	Seminar	Summer 14	2	—
Stochastic Methods	Exercises	Winter 13	2	1.9
Measure and Integration Theory	Exercises	Summer 12	4	1.3
Stochastic Methods	Exercises	Winter 10	2	—

Courses at Dublin City University

Course Name	Format	Acad. Year	Load h/wk
MS117: Probability I	Exercises	2012/13	1
MS136: Business Mathematics	Exercises	2012/13	1
MS144: Accounting Mathematics	Exercises	2012/13	1
MS208: Probability II	Exercises	2012/13	1
MS223: Mathematics for Scientists II	Exercises	2012/13	1
MS225: Introduction to Differential Equations	Exercises	2012/13	2
MS230: Introduction to Numerical Methods	Exercises	2012/13	1
MS117: Probability I	Exercises	2011/12	1
MS125: Mathematics for Scientists I	Exercises	2011/12	1
MS136: Business Mathematics	Exercises	2011/12	2
MS216: Mathematics of Finance: An Introduction	Exercises	2011/12	2
MS230: Introduction to Numerical Methods	Exercises	2011/12	2