

# Curriculum Vitae

**Prof. Dr. Christoph Belak**  
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Institute of Mathematics  
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## Personal Details

Name **Christoph Belak**  
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Website <http://belak.ch/>  
Date of Birth 22.01.1987 in Mainz, Germany



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## 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

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## 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

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## Prizes and Awards

- 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
- 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 (DGVMF)  
 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*
- 09/2018 **Teaching Award of the University of Trier** (Nomination)  
 For lecture on *Stochastic Analysis and Mathematical Finance* held in the summer term 2018
- 04/2017 **Rhineland-Palatinate Award for Excellence in Teaching** (Nomination)  
 Institutes of Higher Education Evaluation Network South-West

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## Third-Party Funding

- 10/2020 **Berlin-Oxford IRTG 2544: Stochastic Analysis in Interaction**  
 International Research Training Group between TU Berlin, Humboldt University Berlin, Weierstraß-Institute Berlin (WIAS) and University of Oxford  
 Supplemental proposal for project *Complexity Reduction in Stochastic Optimal Control* with Samuel Cohen

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## Doctorate Students

- Since 01/2021 **Alexander Merkel**  
 Optimal liquidation problems with unobservable price impact parameters; particle filters and optimal control in Wasserstein space  
 Joint supervision with Samuel Cohen
- Since 10/2019 **Emanuel Rapsch**  
 Principal-agent problems with applications to the energy transition; Deep-learning based methods for stochastic control problems

## Academic Service

- Referee** For 16 peer-reviewed journals:  
 Applied Mathematics and Optimization, Applied Probability Journals, Finance and Stochastics, IEEE Transactions on Automatic Control, 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, Optimal Control Applications and Methods, Risks, SIAM Journal on Control and Optimization, SIAM Journal on Financial Mathematics, Stochastic Models, 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** **Research Internship**  
 Research project in deep learning with 3 M.Sc. students, TU Berlin, since 05/2020  
**Mathematics Ambassadors**  
 Project to promote Mathematics Courses of the University of Trier in High Schools
- Memberships** German Society for Insurance and Financial Mathematics (DGVMF)

## Invited Talks and Presentations

- 2020** 20. Dublin City University
- 2019** 19. TU Graz  
 18. University of Oxford  
 17. WU Vienna  
 16. University of Ulm  
 15. SIAM Conference on Control and its Applications (CT19), Chengdu  
 14. Conference on Stochastic Modeling in Finance and Insurance, Bedlewo
- 2018** 13. TU Berlin  
 12. IFIP TC 7 Conference on System Modelling and Optimization, Essen  
 11. Symposium on Optimal Stopping in Memory of Larry Shepp, Houston  
 10. University of Bielefeld  
 9. Carnegie Mellon University  
 8. University of Michigan
- 2017** 7. Workshop on Optimal Stopping in Complex Environments, Bielefeld  
 6. London School of Economics  
 5. 8th General AMaMeF Conference, Amsterdam  
 4. Byrne Young Researcher Workshop on Mathematical Finance, Ann Arbor
- 2016** 3. University of Hamburg
- 2014** 2. University of Hamburg
- 2011** 1. Dublin City University

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## Contributed Talks and Presentations

- 2019** 22. Stochastic Models and Control Workshop, Cottbus
- 2018** 21. 10th Bachelier Finance Society World Congress, Dublin
- 2017** 20. 11th Bachelier Colloquium, Métabief
- 2016** 19. Vienna Congress on Mathematical Finance, Vienna
- 18. 9th Bachelier Finance Society World Congress, New York
- 17. Quantitative Finance QP++ Symposium, Trier
- 16. 12th German Probability and Statistics Days, Bochum
- 15. 10th Bachelier Colloquium, Métabief
- 2015** 14. 9th Bachelier Colloquium, Métabief
- 2014** 13. TU Munich & TU Kaiserslautern Ph.D. Seminar, Kaiserslautern
- 12. 11th German Probability and Statistics Days, Ulm
- 2013** 11. International Workshop on Regime Switching Models in Finance, Kaiserslautern
- 10. TU Munich & TU Kaiserslautern Ph.D. Seminar, Bad Tölz
- 9. 6th European Summer School in Financial Mathematics, Wien
- 8. 6th AMaMeF and Banach Center Conference, Warschau
- 7. Frontiers in Financial Mathematics, Dublin
- 6. 7th Bachelier Colloquium, Métabief
- 2012** 5. TU Munich & TU Kaiserslautern Ph.D. Seminar, Lambrecht
- 4. Optimal Stopping, Control and Finance Workshop, Warwick
- 3. 7th Bachelier Finance Society World Congress, Sydney
- 2. 10th German Probability and Statistics Days, Mainz
- 1. 6th Bachelier Colloquium, Métabief

## Publications

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### Publications in Peer-Reviewed Journals

10. *Continuous-Time Mean Field Games with Finite State Space and Common Noise* (with Daniel Hoffmann and Frank Seifried), to appear in **Appl. Math. Optim.**, 2021
9. *Liquidation in Target Zone Models* (with Johannes Muhle-Karbe and Kevin Ou), **Market Microstruct. Liquidity**, Vol. 4, No. 03n04, 1950010 (12 pages), 2020
8. *Finite-Horizon Optimal Investment with Transaction Costs: Construction of the Optimal Strategies* (with Jörn Sass), **Finance Stoch.**, Vol. 23, No. 4, pp. 861–888, 2019
7. *Utility Maximisation in a Factor Model with Constant and Proportional Transaction Costs* (with Sören Christensen), **Finance Stoch.**, Vol. 23, No. 1, pp. 29–96, 2019
6. *Backward Nonlinear Expectation Equations* (with Thomas Seiferling and Frank Seifried), **Math. Financ. Econ.**, Vol. 12, No. 1, pp. 111–134, 2018
5. *A General Verification Result for Stochastic Impulse Control Problems* (with Sören Christensen and Frank Seifried), **SIAM J. Control Optim.**, Vol. 55, No. 2, pp. 627–649, 2017
4. *Worst-Case Portfolio Optimization in a Market with Bubbles* (with Sören Christensen and Olaf Menkens), **Int. J. Theor. Appl. Finance**, Vol. 19, No. 2, 1650009 (36 pages), 2016
3. *On the Uniqueness of Unbounded Viscosity Solutions arising in an Optimal Terminal Wealth Problem with Transaction Costs* (with Olaf Menkens and Jörn Sass), **SIAM J. Control Optim.**, Vol. 53, No. 5, pp. 2878–2897, 2015
2. *Worst-Case Portfolio Optimization with Proportional Transaction Costs* (with Olaf Menkens and Jörn Sass), **Stochastics**, Vol. 87, No. 4, pp. 623–663, 2015
1. *Worst-Case Optimal Investment with a Random Number of Crashes* (with Sören Christensen and Olaf Menkens), **Statist. Probab. Lett.**, Vol. 90, pp. 140–148, 2014

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### PhD Thesis

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

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### Preprints

3. *Optimal Investment for Retail Investors with Floored and Capped Costs* (with Lukas Mich and Frank Seifried), available at <https://ssrn.com/abstract=3447346>, 2019
2. *Branching Diffusions with Jumps and Valuation with Systemic Counterparties* (with Daniel Hoffmann and Frank Seifried), available at <https://ssrn.com/abstract=3451280>, 2019
1. *Pricing Contingent Claims under Jump Uncertainty* (with Olaf Menkens), available at <https://ssrn.com/abstract=2773231>, 2017