

Marcel F. Nutz

Email: mnutz@columbia.edu

Web: <http://www.math.columbia.edu/~mnutz/>

Employment and Education

- *Associate Professor* with tenure, Department of Statistics, Columbia University, also affiliated with the Department of Mathematics, 2016–present (tenured 2017).
- *Assistant Professor* (tenure-track), ditto, 2014–2016.
- *J. F. Ritt Assistant Professor*, Department of Mathematics, Columbia University, 2011–2014.
- *Postdoctoral Research Fellow* (with H. M. Soner), ETH Zurich, 2010–2011.
- *Ph.D. in Mathematics*, ETH Zurich, 2010.
- *Diploma in Mathematics* with distinction, ETH Zurich, 2007.

Visiting Positions and Extended Visits

- Ecole Polytechnique, Paris, France, 2017, 2014.
- *Professeur Invité* at Université Paris Dauphine, France, 2016.
- Forschungsinstitut für Mathematik (FIM), ETH Zurich, Switzerland, 2012.
- *Professeur Invité* at Université Paris Dauphine, France, 2012.
- *Professeur Invité* at Université d'Evry, France, 2012.
- Humboldt University Berlin, Germany, 2009.

Awards and Honors

- *Alfred P. Sloan Research Fellow*, 2016–2018 (extended through 2020).
- *Minerva Foundation Fellow*, 2011–2014.
- NSF Grant DMS-1812661, 2018–2021.
- NSF Grant DMS-1512900, 2015–2018.
- NSF Grant DMS-1208985, 2012–2015.
- Swiss NSF Grant PDFM2-120424/1, 2008–2011 (for PhD).
- *Medal of ETH*, 2007.
- Select plenary lectures:
 - 13th German Probability and Stochastic Days, Freiburg, Germany, 2018.
 - Thera Stochastics—A Mathematics Conference in Honor of Ioannis Karatzas, Greece, 2017.
 - Advances in Financial Mathematics, Paris, France, 2017.
 - 6th IMS–FIPS Workshop, Edmonton, Canada, 2016.
 - Byrne Workshop on Stochastic Analysis in Finance and Insurance, Ann Arbor, 2016.

Publications and Preprints

36. M. Nutz, J. San Martin and X. Tan. Convergence to the Mean Field Game Limit: A Case Study. Preprint arXiv:1806.00817, 2018.
35. M. Nutz and Y. Zhang. A mean field competition. Preprint arXiv:1708.01308, 2017.
34. M. Nutz and J. A. Scheinkman. Shorting in speculative markets. Preprint SSRN:2969112, 2017.
33. M. Nutz, F. Stebegg and X. Tan. Multiperiod martingale transport. Preprint arXiv:1703.10588, 2017.
32. J. Muhle-Karbe and M. Nutz. A risk-neutral equilibrium leading to uncertain volatility pricing. *Finance & Stochastics*, to appear.
31. M. Nutz and F. Stebegg. Canonical supermartingale couplings. *Annals of Probability*, to appear.
30. M. Nutz. A mean field game of optimal stopping. *SIAM Journal on Control and Optimization*, Vol. 56, No. 2, pp. 1206–1221, 2018.
29. A. Neufeld and M. Nutz. Robust utility maximization with Lévy processes. *Mathematical Finance*, Vol. 28, No. 1, pp. 82–105, 2018.
28. J. Guyon, R. Menegaux and M. Nutz. Bounds for VIX futures given S&P 500 smiles. *Finance & Stochastics*, Vol. 21, No. 3, pp. 593–630, 2017.
27. M. Beiglböck, M. Nutz and N. Touzi. Complete duality for martingale optimal transport on the line. *Annals of Probability*, Vol. 45, No. 5, pp. 3038–3074, 2017.
26. S. Biagini, B. Bouchard, C. Kardaras and M. Nutz. Robust fundamental theorem for continuous processes. *Mathematical Finance*, Vol. 27, No. 4, pp. 963–987, 2017.
25. A. Neufeld and M. Nutz. Nonlinear Lévy processes and their characteristics. *Transactions of the American Mathematical Society*, Vol. 369, No. 1, pp. 69–95, 2017.
24. B. Bouchard and M. Nutz. Consistent price systems under model uncertainty. *Finance & Stochastics*, Vol. 20, No. 1, pp. 83–98, 2016.
23. B. Bouchard and M. Nutz. Stochastic target games and dynamic programming via regularized viscosity solutions. *Mathematics of Operations Research*, Vol. 41, No. 1, pp. 109–124, 2016.
22. M. Nutz. Utility maximization under model uncertainty in discrete time. *Mathematical Finance*, Vol. 26, No. 2, pp. 252–268, 2016.
21. M. Nutz. Robust superhedging with jumps and diffusion. *Stochastic Processes and their Applications*, Vol. 125, No. 12, pp. 4543–4555, 2015.
20. B. Bouchard and M. Nutz. Arbitrage and duality in nondominated discrete-time models. *Annals of Applied Probability*, Vol. 25, No. 2, pp. 823–859, 2015.

19. M. Nutz and J. Zhang. Optimal stopping under adverse nonlinear expectation and related games. *Annals of Applied Probability*, Vol. 25, No. 5, pp. 2503–2534, 2015.
18. M. Beiglböck and M. Nutz. Martingale inequalities and deterministic counterparts. *Electronic Journal of Probability*, Vol. 19, No. 95, pp. 1–15, 2014.
17. A. Neufeld and M. Nutz. Measurability of semimartingale characteristics with respect to the probability law. *Stochastic Processes and their Applications*, Vol. 124, No. 11, pp. 3819–3845, 2014.
16. M. Nutz. Superreplication under model uncertainty in discrete time. *Finance & Stochastics*, Vol. 18, No. 4, pp. 791–803, 2014.
15. B. Bouchard, L. Moreau and M. Nutz. Stochastic target games with controlled loss. *Annals of Applied Probability*, Vol. 24, No. 3, pp. 899–934, 2014.
14. A. Neufeld and M. Nutz. Superreplication under volatility uncertainty for measurable claims. *Electronic Journal of Probability*, Vol. 18, No. 48, pp. 1–14, 2013.
13. M. Nutz and R. van Handel. Constructing sublinear expectations on path space. *Stochastic Processes and their Applications*, Vol. 123, No. 8, pp. 3100–3121, 2013.
12. M. Nutz. Random G -expectations. *Annals of Applied Probability*, Vol. 23, No. 5, pp. 1755–1777, 2013.
11. M. Nutz. Pathwise construction of stochastic integrals. *Electronic Communications in Probability*, Vol. 17, No. 24, pp. 1–7, 2012.
10. M. Nutz. A quasi-sure approach to the control of non-Markovian stochastic differential equations. *Electronic Journal of Probability*, Vol. 17, No. 23, pp. 1–23, 2012.
9. B. Bouchard and M. Nutz. Weak dynamic programming for generalized state constraints. *SIAM Journal on Control and Optimization*, Vol. 50, No. 6, pp. 3344–3373, 2012.
8. Y. Dolinsky, M. Nutz and H. M. Soner. Weak approximation of G -expectations. *Stochastic Processes and their Applications*, Vol. 122, No. 2, pp. 664–675, 2012.
7. M. Nutz and H. M. Soner. Superhedging and dynamic risk measures under volatility uncertainty. *SIAM Journal on Control and Optimization*, Vol. 50, No. 4, pp. 2065–2089, 2012.
6. M. Nutz. Risk aversion asymptotics for power utility maximization. *Probability Theory and Related Fields*, Vol. 152, No. 3–4, pp. 703–749, 2012.
5. M. Nutz. Power utility maximization in constrained exponential Lévy models. *Mathematical Finance*, Vol. 22, No. 4, pp. 690–709, 2012.
4. M. Nutz. The Bellman equation for power utility maximization with semimartingales. *Annals of Applied Probability*, Vol. 22, No. 1, pp. 363–406, 2012.
3. J. Muhle-Karbe and M. Nutz. Small-time asymptotics of option prices and first absolute moments. *Journal of Applied Probability*, Vol. 48, No. 4, pp. 1003–1020, 2011.
2. M. Nutz. The opportunity process for optimal consumption and investment with power utility. *Mathematics and Financial Economics*, Vol. 3, No. 3, pp. 139–159, 2010.

1. M. Nutz. Optimal consumption and investment with power utility.
Dissertation ETH Zurich, No. 19272, 2010. Advisor: M. Schweizer. Co-examiners: H. Pham, H. M. Soner, N. Touzi.
0. M. Nutz. Quadratic PDE and backward SDE.
Diploma Thesis ETH Zurich, 2007. Advisor: F. Delbaen.

Advising

Ph.D. Students

- Florian Stebegg, ongoing.
- Xiaowei Tan, ongoing.
- Ariel Neufeld, defended 5/2015. First job: ETH Zurich.

Postdoc Mentor for

- Ruimeng Hu, 2018–.
- Yuchong Zhang, 2015–2018.

Dissertation Committee Member/Referee

Minghan Yan (Mathematics, Columbia), 2017; Léo Neufcourt (Statistics, Columbia), 2017; Lisha Qiu (Statistics, Columbia), 2017; Yinghui Wang (Mathematics, Columbia), 2016; Cameron Bruggeman (Mathematics, Columbia), 2016; Sébastien Choukroun (Mathematics, Paris 7), 2015; Subhankar Sadhukhan (Statistics, Columbia), 2012.

Oral Exam Committee Member

Léo Neufcourt (Statistics, Columbia), 2016. Lisha Qiu (Statistics, Columbia), 2016. Zhi Li (Mathematics, Columbia), 2015. Xiaowei Tan (Mathematics, Columbia), 2015. Cameron Bruggeman (Mathematics, Columbia), 2014.

Invited Talks

- 2018: Conference on Robust Techniques in Quantitative Finance, Oxford; Symposium on Optimal Stopping in Memory of Larry Shepp, Houston; International Workshop on Applied Probability, Budapest; BIRS/CMO Workshop “Stochastic Analysis and its Applications,” Oaxaca (Mexico); Workshop on Stochastic Analysis Applied to Economics, Finance and Insurance, Santiago (Chile); University of Chile, Santiago (Chile); 13th German Probability and Stochastic Days, Freiburg (Germany); Carnegie Mellon University.
- 2017: Koç University, Istanbul; Workshop “Advances in Stochastic Analysis for Risk Modeling,” CIRM (France); First Gran Sasso Workshop on Mathematical Finance, Italy; LUISS Guido Carli, Rome; Workshop “Theoretical Insight through Experimentation”, ICERM, Providence; Colloquium, TU Vienna; “Thera Stochastics—A Mathematics Conference in Honor of Ioannis Karatzas,” Santorini (Greece); Shanghai Advanced Institute of Finance, Shanghai Jiao Tong University; Joint University Symposium on Financial Risk Management, Chinese University of Hong Kong; Hong Kong Polytechnic University;

- Conference “PDE and Probability Methods for Interactions,” Inria Sophia Antipolis (France); Workshop “Mean Field Games,” Nice (France); Workshop “Pricing-Hedging Duality,” Zurich; University of California, Berkeley; Conference “Advances in Financial Mathematics,” Paris.
- 2016: University of Texas at Austin; University of California, Santa Barbara; Sixth IMS–FIPS Workshop, Edmonton; University of Vienna; Second International Congress on Actuarial Science and Quantitative Finance, Cartagena (Colombia); Byrne Workshop on Stochastic Analysis in Finance and Insurance, University of Michigan, Ann Arbor; BIRS/CMO Workshop “Stochastic Analysis and Mathematical Finance,” Oaxaca (Mexico); Workshop on Optimal Transportation, Equilibrium, and Applications to Economics, NYU, New York; Brown University, Providence; Conference “Mathematical Finance Without Probability,” Wolfgang Pauli Institute, Vienna; University of Southern California, Los Angeles.
 - 2015: University of Oxford; International Conference on Stochastic Analysis and Applications, Hammamet (Tunisia); Midwest Probability Colloquium, Northwestern; 11th Columbia–Jafee Conference, New York; Conference “Mathematical Finance Beyond Classical Models,” Institute for Theoretical Studies, Zurich; SPA Conference, Oxford; Bloomberg Quant Seminar, New York; Séminaire Bachelier, Paris; ETH Zurich; Conference “Mathematical Finance and Partial Differential Equations,” Rutgers; Fields Institute, Toronto; University of Michigan, Ann Arbor; Workshop “Optimal Transport and Stochastics,” Hausdorff Research Institute for Mathematics, Bonn.
 - 2014: Princeton University; SIAM Financial Mathematics & Engineering, Chicago; 7th International Symposium on Backward Stochastic Differential Equations, Weihai (China); Thematic Cycle on Robust Management in Finance, Paris; Workshop “Mathematical Finance: Arbitrage and Portfolio Optimization,” BIRS, Banff (Canada); Workshop “Stochastic Analysis in Finance and Insurance,” Oberwolfach (Germany); ETH Zurich; Conference “Advances in Financial Mathematics,” Paris.
 - 2013: University of California, Santa Barbara; University of Southern California, Los Angeles; Workshop on Mathematical Finance, Fields Institute, Toronto; Sixth European Summer School in Financial Mathematics, Vienna; Workshop “New Developments in Stochastic Analysis: Probability and PDE,” Beijing; Workshop “Knightian Uncertainty and Backward Stochastic Differential Equations,” NUS, Singapore; Séminaire Bachelier, Paris; Columbia–Princeton Probability Day, Princeton; ETH Zurich; University of Vienna; CUNY, New York.
 - 2012: Workshop “Games, Model Uncertainty and Related Fields,” Jinan (China); Rutgers University; University of Texas at Austin; SIAM Annual Meeting, Minneapolis; SIAM Financial Mathematics & Engineering, Minneapolis; Université du Maine (France); Université d’Evry (France); Séminaire Bachelier, Paris; ETH Zurich; University of Oxford; Columbia University (Risk Seminar), New York.
 - 2011: Princeton University; University of Michigan, Ann Arbor; University of Southern California, Los Angeles; Columbia University (Statistics), New York; Bielefeld University (Germany); Shandong University, Jinan (China); Workshop on Nonlinear Expectations, Beijing; Western Conference on Mathematical Finance, Los Angeles; Columbia University, New York; Workshop “Stochastic Analysis in Finance and Insurance,” Oberwolfach (Germany); Séminaire Bachelier, Paris.
 - 2010: London School of Economics; Conference “New advances in backward SDEs for financial engineering applications,” Tamerza (Tunisia); AMAMEF Workshop, Berlin; Université Paris 6/7; University of Vienna.
 - 2009: TU & HU Berlin; Workshop “Finance and Insurance,” Jena (Germany); TU & LMU Munich.

Teaching Experience

Columbia University

- *Stochastic Control and Applications in Finance* (GR6507, formerly G6507), Fall 2017, Fall 2014 (new course).
- *Probability Theory III* (GR6303), Fall 2017 (new course), Fall 2016.
- *Probability Theory I* (GR6301, formerly G6105), Fall 2016, Fall 2015.
- *Topics in Advanced Probability: Robust Finance, Optimal Transport and Skorokhod Embeddings* (G8243), Spring 2015 (new course).
- *Probability Theory* (W4155), Spring 2015, Spring 2014, Spring 2013, Spring 2012.
- *Calculus III* (V1201), Fall 2013 (two sections), Spring 2013, Spring 2012.

Others

- At ETH Zurich: *G-Expectations and Nonlinear Martingales*, Spring 2011 (new course).
- At Bielefeld University: minicourse *Topics in Nonlinear Expectations*, 2011.

Service to Community

- Co-Chair, IMS Standing Committee on Finance, Insurance, Probability and Statistics (FIPS), 2016–.
- Associate Editor for *SIAM Journal on Financial Mathematics*, 2018–.
- Associate Editor for *Stochastic Processes and their Applications*, 2018–.
- ArXiv moderator, 2014–.
- IMS Committee on Nominations, 2016/17.
- Co-organizer of
 - *8th IMS FIPS Workshop*, London, 2018.
 - *METE—Mathematics and Economics: Trends and Explorations*, Zurich, 2018.
 - *Berkeley–Columbia Meeting in Engineering and Statistics*, New York, 2018.
 - *7th IMS FIPS Workshop*, Baltimore, 2017.
 - *Theoretical Insight through Experimentation*, ICERM Workshop, Providence, 2017.
 - *Thera Stochastics—A Mathematics Conference in Honor of Ioannis Karatzas*, Santorini, 2017.
 - *Berkeley–Columbia Meeting in Engineering and Statistics*, Berkeley, 2016.
 - *World Congress of the Bachelier Finance Society*, New York, 2016 (local organizer).
 - *11th Columbia–JAFEE Conference*, New York, 2015.
 - Invited Session on *Optimal Transport and Stochastic Calculus*, SPA conference, Oxford, 2015.
 - *Conference on Stochastic Portfolio Theory and Related Topics*, New York, 2015.
 - *Symposium on Systemic Risk*, New York, 2015.
 - *Probability, Control and Finance—A Conference in Honor of the 60th Birthday of Ioannis Karatzas*, New York, 2012.
- Reviewer for national and international grant-making agencies.

- Referee for: Acta Applicanda Mathematicae, Annals of Applied Probability, Annals of Probability, Applied Mathematical Finance, Bernoulli, Bulletin of the London Mathematical Society, Duke Mathematical Journal, Electronic Communications in Probability, Electronic Journal of Probability, ESAIM: Control, Optimisation and Calculus of Variations, Finance & Stochastics, International Journal of Theoretical and Applied Finance, Journal of Functional Analysis, Journal of Mathematical Analysis and Applications, Journal of Mathematical Economics, Mathematical Finance, Nonlinear Analysis: Theory, Methods & Applications, Proceedings of the London Mathematical Society, Proceedings of the National Academy of Sciences, Review of Financial Studies, SIAM Journal on Control and Optimization, SIAM Journal on Financial Mathematics, Statistics and Probability Letters, Stochastic Processes and their Applications, Stochastics and Dynamics, etc.

Service to University

- Steering committee, *Mathematics of Finance* MA program, 2014–.
- Departmental committees for
 - PhD admission, 2017/18, 2016/17, 2015/16.
 - PhD curriculum, 2017/18.
 - Probability qualifying exam, 2018, 2017 (chair), 2016 (chair).
 - Core Competency exam, 2018.
 - Hiring, 2017/18, 2014/15.
- Co-organizer of
 - Mathematical Finance Seminar, Departments of Mathematics and Statistics, 2012–.
 - Probability Seminar, Departments of Mathematics and Statistics, 2011–.

Last updated: June 5, 2018