

# Marcel F. Nutz

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## 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.
- *Professeur Invité* at Université Paris Dauphine, France, 2016.
- Ecole Polytechnique, Paris, France, 2014.
- 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.
- *Minerva Foundation Fellow*, 2011–2014.
- NSF Grant DMS-1512900 *Model Uncertainty and Optimal Transport*, 2015–2018 (sole PI, \$208,484).
- NSF Grant DMS-1208985 *Stochastic Control under Model Uncertainty*, 2012–2015 (sole PI, \$131,614).
- Swiss National Science Foundation 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

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*

- Yuchong Zhang, 2015–.

### *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.

### *ETH Zurich*

- *G-Expectations and Nonlinear Martingales*, Spring 2011 (new course).

### *Minicourse*

- *Topics in Nonlinear Expectations*, Bielefeld University, 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, 2017 (chair), 2016 (chair).
  - 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: April 29, 2018