PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Sergey Nadtochiy, assistant professor of mathematics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of mathematics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:
Ph.D.	2009	Princeton University
M.A.	2008	Princeton University
M.Sc.	2005	Moscow State University

Professional Record:
2012 – present	Assistant Professor, Department of Mathematics, University of Michigan
2009 – 2012	Senior Post-doctoral Research Fellow, Oxford-Man Institute and Mathematical Institute, University of Oxford

Summary of Evaluation:

Teaching – Professor Nadtochiy has contributed greatly to the teaching mission of the Department of Mathematics. Financial mathematics is an area with high student demand, but there are few faculty qualified to teach this course. As a result, all of his classroom teaching has been in courses connected with financial engineering. His work in the classroom has been outstanding and students have responded with ratings in the upper quartile on the "excellent instructor" item of the E&E questionnaire. In addition, he has contributed to curriculum development, both in the design of individual courses and in the development of the new master's program in Quantitative Finance and Risk Management. Besides classroom teaching, Professor Nadtochiy has provided excellent mentoring for students at the undergraduate and graduate levels, as well as for post-doctoral scholars.

Research – Professor Nadtochiy received his Ph.D. in operations research and financial engineering, and he has established himself as an internationally renowned leader in the field of financial mathematics. His work involves several areas of mathematics, including probability theory, partial differential equations, game theory, and optimal control. Although his work is motivated by applications, Professor Nadtochiy has produced results that are of mathematical interest even apart from applications. The external reviewers praise his work for its technical depth and for its direct applicability to important financial issues. Reviewers are also impressed by the breadth of his research interests, extending far beyond what he did as a doctoral student and as a post-doctoral researcher. His research has been internationally acclaimed and recognized by a CAREER grant from the National Science Foundation and by an Early Career Prize awarded by the Activity Group on Financial Mathematics and Engineering of the Society for Industrial and Applied Mathematics.

Recent and Significant Publications:

"Robust trading of implied skew," with J. Obloj, *International Journal of Theoretical and Applied Finance,* 20(2), 2017.

"Simulation of implied volatility surfaces via tangent Lévy models," with R. Carmona and Y. Ma, *SIAM Journal on Financial Mathematics*, 8(1), 2017, pp. 171–213.

"Weak reflection principle for Levy processes," with E. Bayraktar, *Annals of Applied Probability*, 25(6), 2015, pp. 3251–3294.

"An approximation scheme for solution to the optimal investment problem in incomplete markets," with T. Zariphopoulou, *SIAM Journal on Financial Mathematics*, 4(1), 2013, pp. 494–538.

Service – Professor Nadtochiy's service activities have exceeded what is normally expected of an assistant professor. He has done admirable service work within the Department of Mathematics and in the wider financial mathematics community. He has served on the department's elected Executive Committee, worked as an undergraduate student adviser for five years, and served on the department's Transfer Credit Evaluation Committee for three years. He is an associate editor of the journal *High Frequency*, and he has served as a reviewer for numerous other prominent journals. He also organized a conference that was held in Ann Arbor in 2016.

External Reviews:

Reviewer (A)

"Sergey is a deep thinker. His strength is based on an unusual combined expertise in Probability, Partial Differential Equations and Functional Analysis, and a deep understanding of the financial markets. This cocktail provided him with a perfect background for his new foray in the world of equilibrium models for large populations of traders in the high frequency markets."

Reviewer (B)

"I regularly see Sergey at mathematical finance conferences. He gives very interesting talks and is always eager to discuss. ...I view Sergey as one of the strongest researchers of his [cohort] in mathematical finance."

Reviewer (C)

"Sergey is a very strong mathematician who combines a distinct sense for formal rigor and economic concepts with applications in quantitative finance. His works are at the forefront of various directions. His works are novel and considered influential in the corresponding strands of literature."

Reviewer (D)

"...Sergey's case is the strongest I am seeing. I believe that Sergey is working on truly challenging problems and not merely doing small improvements on existing work as we see much too often. He is on the path to become one of the leaders in our field."

Reviewer (E)

"Deep mathematical insight and versatile a[t] intuition are the defining tracts of Sergey's scholarship. ... Sergey's tenure case is also well-positioned in relation to peers in his [cohort] – or senior. ...[his] funding record also clearly demonstrates his strong standing in the scientific community..."

Reviewer (F)
"In summary, Sergey has a stellar record in every academic dimension, and holds a clear promise of future leadership – by example. His promotion to Associate Professor should be a straightforward matter… In fact, I would be surprised if other top universities had not already approached him with tenured offers. His academic trajectory is soaring, and a strong case for promotion to full professor lies ahead in a few years."

Reviewer (G)
"Sergey is a first-rate scholar [in his cohort] working in Stochastic Analysis and Mathematical Finance. … I have great admiration for this work: deep, beautiful, and directly applicable mathematics."

Reviewer (H)
"After he joined University of Michigan, Sergey has expanded his research scope considerably. … The problems that he has been working on, albeit technical, all have strong motivations in finance and stochastic control/game theory. Sergay [sic] also has an excellent record on NSF funding, highlighted by his recent Career Award."

Summary of Recommendation:
Professor Nadtochiy is an international leader in research in financial mathematics, developing new mathematical methods and applications to significant financial questions. He played a major role in the development of the new masters' program in Quantitative Finance and Risk Management and related courses. His classroom teaching is excellent and he has carried out substantial service responsibilities both within his department and outside the university. The Executive Committee of the College of Literature, Science and the Arts and I recommend that Assistant Professor Sergey Nadtochiy be promoted to the rank of associate professor of mathematics, with tenure, College of Literature, Science, and the Arts.

Andrew D. Martin, Dean
Professor of Political Science and Statistics
College of Literature, Science, and the Arts

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