Approved by the Regents
May 18, 2017

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

David E. Speyer, associate professor of mathematics, with tenure, College of Literature Science, and the Arts, is recommended for promotion to professor of mathematics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2005	University of California, Berkeley
A.B.	2002	Harvard University

Professional Record:

2010 –present	Associate Professor, Department of Mathematics, University of Michigan
2007 – 2010	Clay Research Fellow, Massachusetts Institute of Technology
2005 – 2007	Clay Research Fellow, University of Michigan

Summary of Evaluation:

Teaching – Professor Speyer is an outstanding, dedicated teacher of both undergraduate and graduate students, and a highly successful mentor. He has served as a role model for our beginning faculty and graduate student instructors by teaching freshman calculus, and has contributed to curricular reforms with his overhaul and modernization of the department's introductory course in linear algebra. Outside of the classroom, Professor Speyer has been an active participant in the summer research program for undergraduates, having supervised six such projects. He has also been very productive at the graduate level, having supervised three doctoral theses, with two more expected to finish this year, and two more in the in progress.

Research – Since joining the university in 2010, Professor Speyer has rapidly developed into one of the leading international researchers working at the interface of algebra, geometry, and combinatorics. His research is characterized by originality, deep insights, and technical prowess. It spans an impressively wide range of mathematical disciplines and includes landmark contributions to tropical geometry, cluster algebras, modern Schubert calculus, and enumerative combinatorics. Some of these contributions have found application outside of mathematics; for example, in statistical physics and in the computation of scattering amplitudes for subatomic particles. All indications lead one to expect continued growth from him as an outstanding researcher and leader at the forefront of algebraic and geometric combinatorics.

Recent and Significant Publications:

"Combinatorial frameworks for cluster algebras," with N. Reading, *International Mathematics Research Notices*, 1, 2016, pp. 109-173.

"Weak separation and plabic graphs," with S. Oh and A. Postnikov, *Proceedings of the London Mathematical Society*, 110, 2015, pp. 721-754.

"Projections of Richardson varieties," with A. Knutson and T. Lam, *Journal fur die reine und angewandte Mathematik*, 687, 2014, pp. 133-157.

"K-classes of matroids and equivariant localization," with A. Fink, *Duke Mathematical Journal*, 161, 2012, pp. 2699-2723.

Service – Professor Speyer has done a substantial amount of service for the Department of Mathematics, including stints on the Doctoral Committee (counseling and monitoring graduate students in the doctoral program), the Graduate Admissions and Fellowships Committee, and writing and grading exams for the qualifying review for admission to candidacy. For the past few years, Professor Speyer has co-directed the department's summer research program for undergraduate students, attracting more than 30 student participants in each annual cycle. Outside the department, he has organized numerous workshops and conferences, and has served on the college's REBUILD committee, a National Science Foundation-funded project to revitalize the teaching of large core courses in STEM subjects.

External Reviewers:

Reviewer (A)

"…he has contributed pioneer work with the key people. Sturmfel[s] in tropical geometry, Pos[t]nikov with positroids, Reading with Cambrian objects, and more. What I see is that he not only collaborate[s] with the best but also bring[s] new ideas. Very recently…Kamnitzer mentioned that the fundamental idea in his work on representation[s] of algebraic groups was suggested by Speyer. This shows that David Speyer's work has great impact in mathematics, enough to inspire the best in many area[s] of mathematics."

Reviewer (B)

"David Speyer combines a great deal of mathematical knowledge with a strong intuition and an exceptional creativity. It is fair to say that he is among the most productive researchers in his field. From the beginning of his career until today his work has been and still is a rich source of inspiration to myself and many others."

Reviewer (C)

"There is a new program at (my home institution)…under which the university gives departments positions specifically targeted at senior faculty in specific research areas. In math we are recruiting for one such position, targeted at Combinatorics, broadly defined. The associated hiring committee consists of the 5 people, myself included, in the department most interested in combinatorics. At our first meeting, Speyer was the unanimous first choice…"

Reviewer (D)

"…I have always found his research to be deep and important. He has a great publication record and interesting research program underway. My impression is that he is the world expert in his domain, and even though I can't define this domain in a few words, most mathematicians would agree with me that it is a fundamental part of modern combinatorics. For me this fact is enough to give him my full support for a full professorship position."

Reviewer (E)

"…this is one of the easiest full professor decisions you will have to make. I would twist people's arms until they come off to hire David at [my institution]… His breadth of knowledge across geometry, combinatorics, number theory, and algebra, and readiness to connect these fields, is of the highest order. … Michigan is deeply fortunate to have the chance to make David full professor."

Reviewer (F)
"…I would like to emphasize that Speyer has outstanding abilities to communicate mathematics to a broad audience. This can be seen from his untiring activity on mathematical blogs, and is also well reflected in his inspired and inspiring Teaching Statement. In conclusion, I am totally convinced that SPEYER fully deserves a position of professor with tenure at the University of Michigan, and I recommend him whole-heartedly."

Reviewer (G)
"David Speyer's research work is highly visible nationally and internationally, and I would regard his as a strong contribution to development in mathematics across a broad range of areas which is deep and has an impact on the international research agenda."

Reviewer (H)
"David Speyer is definitely one of the strongest researchers in the area of algebraic and geometric combinatorics. He is a world class leader in this area of mathematics. … Speyer definitely deserves a full professorship in any top university."

Reviewer (I)
"I hope I have conveyed the impressive breadth and depth of Speyer's interests, and how much I admire his work. He has developed a world-wide reputation as a leader in combinatorics."

Summary of Recommendation:
Professor Speyer has become a recognized leader in algebraic and geometric combinatorics. His research is characterized by originality, deep insights, and technical prowess. At the same time, he is a dedicated and effective teacher and mentor. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor David E. Speyer be promoted to the rank of 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

May 2017