

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

Andrew Snowden, 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
B.A.	2004	University of Maryland

Professional Record:

2013 – present	Assistant Professor, Department of Mathematics, University of Michigan
2012 – 2013	National Science Foundation (NSF) Post-doctoral Fellow, Department of Mathematics, Massachusetts Institute of Technology
2010 – 2012	C.L.E. Moore Instructor, Department of Mathematics, Massachusetts Institute of Technology
2009 – 2010	NSF Post-doctoral Fellow, Department of Mathematics, Stanford University

Summary of Evaluation:

Teaching – Professor Snowden is a gifted and dedicated teacher of both graduate and undergraduate students, who has received uniformly excellent student evaluations for his classroom teaching. He has been an active participant in the departmental summer research program for undergraduate students, supervising four such projects. While it is somewhat unusual for Department of Mathematics’ faculty, prior to tenure, to serve as thesis advisors for doctoral students, Professor Snowden is already supervising two such students as well as serving as a mentor for two post-doctoral students.

Research – Professor Snowden’s research achievements have been nothing short of phenomenal. His work involves an amazingly broad and deep swath of commutative algebra, algebraic geometry, representation theory, and number theory. Especially noteworthy is his foundational work on the Langlands Program in arithmetic geometry, his work on geometric invariant theory, and his collaboration on stability patterns in representation theory. All of these have drawn international attention, but the most impressive is that the latter of these was singled out as a topic for coverage at the Bourbaki Seminar in Paris. This amounts to a recognition that it is among the most important advances in mathematics of the past year.

Recent and Significant Publications:

“Stability patterns in representation theory,” with S. Sam, *Forum of Mathematics Sigma*, forthcoming.

“Finiteness of K3 surfaces and the Tate conjecture,” with M. Lieblich and D. Maulik, *Annales Scientifiques d’ENS*, 47, 2014, pp. 285-308.

“Syzygies of Segre embeddings and Delta-modules,” *Duke Mathematical Journal*, 162, 2013, pp. 225-277.

“The ideal of relations for the ring of invariants of n points on the line,” with B. Howard, et al.,
Journal of the European Mathematical Society, 14, 2012, pp. 1-60.

Service – Professor Snowden has done a substantial amount of service for the Department of Mathematics, including three consecutive years serving as a co-organizer for the Undergraduate Math Club. This club hosts speakers for weekly meetings and plays an important role in maintaining a sense of community among the approximately 600 undergraduate students with a mathematics concentration. Recently, he began serving on the departmental Honors Committee. He also co-organized a department seminar and a year-long learning seminar on arithmetic geometry. Externally, he is co-organizing a workshop on representation stability set to take place next year at the American Institute of Mathematics.

External Reviewers:

Reviewer (A)

“...this is a slam dunk case – I very strongly recommend such a promotion. Michigan made a brilliant move when they somehow persuaded Andrew to apply exclusively to Michigan a few years ago. ... His work is both deep and broad, and continues to develop in interesting directions.”

Reviewer (B)

“Snowden’s expertise across diverse areas of algebraic geometry, representation theory, and number theory has complemented and strengthened the UM’s world-class expertise in these fields, and provides a strong connection between algebraic geometers and representation theorists. His down-to-earth mathematical style, rich in examples even though he works with rather abstract concepts, makes him a great colleague with whom to discuss many things and I am sure he has been a very good mentor and advisor to graduate students (some graduate students here eagerly watched all of the videos of one of Snowden’s graduate courses, which he posted on the Internet as an experiment).”

Reviewer (C)

“...I hold Andrew Snowden for [sic] one of the most promising mathematicians working on functor categories and their interactions with algebra and geometry... His preprint *Gröbner methods for representations of combinatorial categories* (joint with Steven Sam) is clearly the most important work on finiteness properties in functor categories (and one of the most important works in the whole area of functor categories) of these last years and deserves to be published in one of the best mathematical journals of the world.”

Reviewer (D)

“He is contributing both to initial, particular examples motivating the field and to foundations for the general theory [of equivariant commutative algebra]. If I were to compile a list of important results in this area, then it would certainly include three of Snowden’s papers: his Duke paper on points on P^1 , his Duke paper on...[Delta]-modules, and his preprint with Sam on a general framework for representations of combinatorial categories.”

Reviewer (E)

“...Andrew is an extraordinary mathematician [in his cohort] distinguished in both depth of insight and creativity. I rate him among the very best people [in his cohort] in algebraic

geometry... The work Andrew is doing right now with Steven Sam seems to me to have the potential to be a field in itself. He's the kind of mathematician who makes any department much more interesting. ...we would hire him at [my institution]..."

Reviewer (F)

"The Sam-Snowden papers are extremely impressive. They use tools from all over mathematics: algebraic geometry, combinatorics, homological algebra, representation theory, Gröbner bases, formal language theory, and much more[.] The papers are really clear and well-written. ...Sam-Snowden produced so much good mathematics so quickly that I would say most of their work has yet to be absorbed by the community. It is quite overwhelming in scope."

Reviewer (G)

"I'm honored to write in support of the proposed promotion of Andrew Snowden to Associate Professor with tenure. Snowden is one of the strongest mathematicians [in his cohort] around – in any field – and the case for his promotion at this time is extremely compelling. ... For most mathematicians [in his cohort], one can get a pretty good sense by the time they are a few years past their PhDs of the general level in which their research is likely to fall. In the case of Snowden, however, I don't see any obvious upper bound to what he could accomplish in the coming years."

Reviewer (H)

"...[the joint work of Snowden with Howard, Millson, and Vakil] is a beautiful result about a classical object. Moreover, in some sense the formalism they set up to prove it inspired Snowden's later work on representation stability; indeed, if you look at x1.7 of the JEMS [*Journal of the European Mathematical Society*] paper, you will see a primitive description of the sort of structures he went on to study. This points to a feature of Snowden's work on representation theory and geometry that I was struck by as I reviewed it to write this letter: though it concerns a wide variety of objects and uses a huge swath of tools, it also has a strong intellectual coherence. I find this very impressive."

Summary of Recommendation:

Professor Snowden is a rising star with amazing depth and breadth in algebra, algebraic geometry, and number theory. At the same time, he is an outstanding and innovative teacher. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Andrew Snowden 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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