

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

Anna C. Gilbert, 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.	1997	Princeton University
S.B.	1993	University of Chicago

Professional Record:

2004 – present	Assistant Professor, Department of Mathematics, University of Michigan
2002 – 2004	Principal Technical Staff Member, AT&T Labs-Research
1998 – 2002	Senior Technical Staff Member, AT&T Labs-Research
1997 – 1998	Postdoctoral Research Associate, Yale University and AT&T Labs-Research

Summary of Evaluation:

Teaching – With only two years at the University of Michigan, Professor Gilbert has a short teaching record. Her previous appointments were in research for AT&T. It took her a bit of time to settle in, but it is already clear that she is well on her way to becoming an excellent instructor. Student evaluations for her most recent course, Fourier Analysis, are excellent. By focusing the course on the development of the theory of wavelets, she has been able to attract students from the applied sciences as well as mathematics. She has been active in directing research at both the undergraduate and graduate levels.

Research – Professor Gilbert’s research is focused on the design of efficient algorithms for signal processing and the extraction of information from large data sets. Her work is characterized by a combination of theory and application. She is interdisciplinary in the best possible sense, using sophisticated mathematical ideas from harmonic analysis and approximation theory to design and rigorously analyze new algorithms with applications in computer science. She is the author of 38 refereed publications, many of which have appeared in the most prestigious vehicles within her subject. Her work has had major impact and has been recognized by several grants, including a Sloan Research Fellowship and a National Science Foundation CAREER award.

Recent and Significant Publications:

“Theoretical and experimental analysis of a randomized algorithm for sparse Fourier transform analysis,” with J. Zou, et al., *Journal of Computational Physics*, 211(2), 2006, pp. 572-595.

“Improved time bounds for near-optical sparse Fourier representation via sampling,” with S. Muthukrishnan and M. J. Strauss, *Proceedings of SPIE Wavelets XI*, San Diego, 2005.

“Wavelet analysis of conservative cascades,” with S. Resnick, et al., *Bernoulli*, 9(1), 2003, pp. 97-135.

“On the fractal behavior of TCP,” with H. Karloff, *Proceedings of the 2003 ACM Symposium on Theory of Computing*, 2003, pp. 297-306.

Service – Professor Gilbert has served on the Computing Committee and the Admissions and Fellowships Committee for the Applied and Interdisciplinary Mathematics (AIM) Program. In 2005-2006, she served as the junior faculty representative on the departmental Executive Committee. This is perhaps the most time consuming committee in the Department of Mathematics. She is also active as a referee and is on the editorial board of *Communications in Mathematical Sciences*.

External Reviews:

Reviewer (A)

“Her work on sparse representation or compressed sensing is arguably part of one of the most important areas of computational harmonic analysis, attracting some of the best people in the field... I believe Gilbert’s ranking in sparse representation research and her creation of all-important associated algorithms put her in the top handful internationally.”

Reviewer (B)

“You ask me whether these works would be on my list of the most significant articles which have appeared recently in her field of specialty. Of course they would. But *these two papers are among the most important papers I have ever read, period.* ... In the last year or so, I have written evaluation letters on behalf of candidates seeking a permanent position in US or European universities. While most of these candidates amply deserved to receive tenure, Anna stands head and shoulders above each one of them.”

Reviewer (C)

“...since 2002 approximately, she launched an ambitious and very productive research program dealing with the fast recovery of signals from sparse measurements, most of the time in a probabilistic framework. ... I am particularly impressed by this program, which is at the crossroads of mathematical analysis, approximation theory, probabilities and computer science.”

Reviewer (D)

“...Gilbert is a rising star in a number of particularly important areas. She has made a variety of important and well-known contributions in computer networking. She has an excellent record of publication and grant funding. She clearly meets the standard for tenure...”

Reviewer (E)

“She had achieved excellent results when you hired her, and showing promise for more; she has lived up to that promise, and she clearly has a lot in store still. She is also proving herself an effective mentor for younger researchers, postdocs as well as graduate students. I recommend, in the very strongest terms, that you grant her tenure.”

Reviewer (F)

“This is an enthusiastic letter of recommendation for promotion to tenure for Anna Gilbert. ... She is productive and influential...it can easily be seen that she would normally be promoted to tenure in a mathematical sciences department at a major research university.”

Reviewer (G)

“...she is a major figure in the field concerned with the statistical analysis and modeling of network traffic. Her papers in this area, both co-authored and single-authored, have had an important impact on how the field is defined. In particular, Dr. Gilbert has blended a mathematically sophisticated approach to multiscale analysis with a real appreciation of the intricacies of network protocols, and this has set an admirably high standard for other work in the field.”

Reviewer (H)

“The case of Anna C. Gilbert is obvious. Inside her age group, she is an excellent applied mathematician. ... What is truly remarkable in A. Gilbert’s work is her subtle balance between bright mathematical ideas and efficient pragmatism. ...Gilbert would be hired by any major American University if she wanted.”

Reviewer (I)

“...Ana [sic] excels in both the pure and applied aspects of her field, allowing her to design algorithms that are innovative, practical, and also backed up by theory. As such I consider her to be one of the leaders in the field... ...Anna’s research is strong, relevant, and impressive...”

Summary of Recommendation:

Professor Gilbert has a substantial research program and her teaching record is quite good. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Anna C. Gilbert be promoted to the rank of associate professor of mathematics, with tenure, in the College of Literature, Science, and the Arts.



Terrence J. McDonald
Arthur F. Thurnau Professor,
Professor of History, and Dean
College of Literature, Science, and the Arts

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