

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

Martin J. Strauss, associate professor of mathematics, with tenure, College of Literature, Science, and the Arts, and associate professor of electrical engineering and computer science, without tenure, College of Engineering, is recommended for promotion to professor of mathematics, with tenure, College of Literature, Science, and the Arts, and professor of electrical engineering and computer science, without tenure, College of Engineering.

Academic Degrees:

Ph.D.	1995	Rutgers University
A.B.	1989	Columbia University

Professional Record:

2008 – present	Associate Professor, Department of Mathematics and Department of Electrical Engineering and Computer Science, University of Michigan
2006 – 2007	Visiting Associate Research Scholar, Program in Applied and Computational Mathematics, Princeton University
2004 – 2008	Assistant Professor, Department of Mathematics and Department of Electrical Engineering and Computer Science, University of Michigan
1997 – 2004	Principal Investigator, AT&T Laboratories—Research
1996	Consultant, AT&T Laboratories
1995 – 1996	Postdoctoral Research Associate, Computer Science Department, Iowa State University

Summary of Evaluation:

Teaching - Professor Strauss' teaching is divided between the Mathematics Department and the Computer Science and Engineering Division of the Department of Electrical Engineering and Computer Science (EECS). Because of departmental needs, most of his teaching in recent years has been at the upper-division undergraduate level, often in the area of numerical analysis, for which there is high student demand. Professor Strauss also developed a new course on probabilistic and interactive proofs, which he offered for the first time in Winter 2010. It attracted students from mathematics, computer science, and philosophy. He has supervised three doctoral students, a Masters student, and two postdoctoral researchers. He has also supervised two students, one undergraduate and one graduate, in designing mathematics-oriented activities for the Ann Arbor Hands-On Museum.

Research – Professor Strauss has established himself as a leader in the field of compressed sensing, where the main problem is to efficiently extract useful information from data sets (or streams) so huge that even looking at all the data is not feasible. He has produced excellent algorithms for this purpose, along with rigorous proofs of their desired properties. He has also worked in several other areas, including cryptography and computational complexity. There is every indication that Professor Strauss will continue to produce research of very high quality.

#### Recent and Significant Publications:

- “Space-optimal heavy hitters with strong error bounds,” with R. Berinde, et al., *Transactions on Database Systems (TODS)*, 35(4), 2010, pp. 26:1-26:28.
- “Private multiparty sampling and approximation of vector combinations,” with Y. Ishai, et al., *Theoretical Computer Science*, 410(18), 2009, pp. 1730–1745.
- “Near-optimal Bayesian localization via incoherence and sparsity,” with V. Cevher, et al., *ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)*, 2009, pp. 205–216.
- “Fast private norm estimation and heavy hitters,” with J. Killian, et al., *Theoretical Cryptography Conference*, 2008, pp. 176–193.

Service – Professor Strauss has had heavy service assignments in both units where he holds appointments, including the last three years on the Department of Mathematics’ Doctoral Committee and the EECS Graduate Admissions and Undergraduate Advising committees. He has served on the program committees of numerous conferences, on the editorial boards of *Contemporary Mathematics* and *Theory of Computing Systems* and a series of proceedings publications, and he has served as a referee for numerous journals.

#### External Reviews:

##### Reviewer (A)

“He has published papers in the very best conferences in theoretical computer science...as well as in the best conferences in Data Bases... He is productive, energetic, and active, has significant research accomplishments and wide interests that combine Mathematics and Computer Science, and collaborates very successfully with lots of excellent researchers.”

##### Reviewer (B)

“Technically, Dr. Strauss’s [sic] *field of expertise* is theoretical computer science. However, this does not do justice to this talented individual who works in dozens of areas of research and excels at all of them. ... I know of no one in the world who possesses the depth and breadth of Dr. Strauss. He produces fundamental results in dozens of areas of research... ..Strauss has publications in all the top journals for the areas concerned...”

##### Reviewer (C)

“Prof. Strauss is a world-renowned expert in the field of randomized algorithms and their applications to sparse approximation.”

##### Reviewer (D)

“I strongly support the promotion of Martin Strauss to Full Professor. ... Martin (with coauthors) had one of the pioneering papers on [streaming as a valid paradigm for storing data in memory and processing it]...and it is much referred to and has inspired a lot of later work.”

##### Reviewer (E)

“Dr. Strauss has demonstrated time and again an expertise to develop deep mathematical theory and algorithms and apply them to challenging real world problems. ... He will continue to be a true asset...at Michigan.”

Reviewer (F)

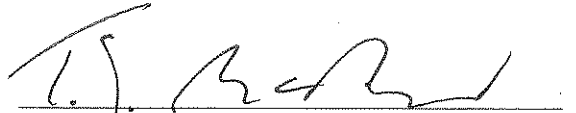
“He is one of the leaders in this exciting subject [compressed sensing], with the rare ability to combine both first-class theoretical mathematical ability with a strong awareness of applications and the practical constraints that real-world problems offer.”

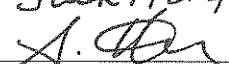
Reviewer (G)

“...Dr. Strauss is an outstanding researcher and scientist who has made significant contributions to the development of fields of mathematics and computer science that are important both for theory and for applications. ... His motivation and energy in attacking open questions from various fields of applied mathematics and computer science are amazing. ... [he] has very strong grant support. His recent NSF Career grant is an outstanding achievement.”

Summary of Recommendation:

Professor Strauss is a leader in his area of research. He makes an important contribution to the University's teaching mission, both in classroom teaching and in supervision of students at all levels as well as postdoctoral researchers. He has fulfilled substantial service responsibilities in both of his departments. The Executive Committees of the College of Literature, Science, and the Arts and the College of Engineering and we recommend that Associate Professor Martin J. Strauss be promoted to the rank of professor of mathematics, with tenure, College of Literature, Science, and the Arts, and professor of electrical engineering and computer science, without tenure, College of Engineering.

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

*S. Jack Hu for Dave Munson*  
  
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David C. Munson, Jr.  
Robert J. Vlasic Dean of Engineering  
College of Engineering

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