

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

Approved by the Regents
May 14, 2009

Daniel B. Forger, 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:

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| Ph.D. | 2003 | New York University |
| M.S. | 1999 | Harvard Graduate School of Arts and Sciences |
| B.A. | 1999 | Harvard College |

Professional Record:

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| 2008 – present | Research Assistant Professor, Center for Computational Medicine and Biology, Medical School, University of Michigan |
| 2005 – present | Assistant Professor, Department of Mathematics, University of Michigan |
| 2003 – 2005 | Sloan Postdoctoral Fellow, Biology Department, New York University |
| 2003 | Research Consultant, Department of Neurology, Medical School, University of Massachusetts |

Summary of Evaluation:

Teaching — Professor Forger’s classroom teaching has been concentrated in applied mathematics courses, especially in mathematical biology where he designed three new courses. In two of these courses he provided typed notes for every class because no suitable textbook was available. Student response has been very positive and they have given Professor Forger high ratings. Outside the classroom, he has a high level of one-on-one instruction.

Research — Professor Forger has established himself as a leading expert on the circadian clock (the mechanism by which living organisms synchronize with the day-night cycle) and its basis at the cellular and molecular level. He works on biologically significant problems and is recognized for his ability to communicate to biologists the importance of his mathematical models for their experimental work. Through experimental confirmation, one of his models led to a complete reversal of what had previously been “known” about the molecular cause of familial advanced sleep phase syndrome. It is unusual that a mathematical model will lead to the reversal of established knowledge about the molecular cause of an illness. Professor Forger’s recent work has expended into neuroscience and into the general theory of oscillatory behavior.

Recent and Significant Publications:

“Rate constants rather than biochemical mechanism determine behavior of genetic clocks,” with E. Conrad, et al., *Journal of the Royal Society Interface*, 5, 2008, pp. 9-15.
“Modeling the electrophysiology of suprachiasmatic nucleus neurons,” with C. K. Sim, *Journal of Biological Rhythms*, 22, 2007, pp. 445–453.

“An opposite role for tau in circadian rhythms revealed by mathematical modeling,” with M. Gallego, et al., *Proceedings of the National Academy of Sciences*, 103, 2006, pp. 10618–10623.

“Noisy inputs and the induction of on-off switching behavior in a neuronal pacemaker,” with D. Paydarfar and J. R. Clay, *Journal of Neurophysiology*, 96, 2006, pp. 3338–3348.

Service — Professor Forger has served on the graduate admissions and fellowships committees, the departmental Executive Committee, and for two years on the computer committee. He has organized events in connection with the mathematical biology theme semester, even though he was on leave at the time. Outside the university, he organized a workshop and a symposium, and served as guest editor for a special issue of the *Journal of Biological Rhythms*, as a referee for numerous journals, and as an outside reviewer for a tenure case.

External Reviews:

Reviewer (A)

“It is my belief that Forger is *the* leading researcher in the field of circadian rhythms on a world-wide basis. ... Forger has a kind of genius for mathematical modeling. He is able to sift through large amounts of noisy and incomplete experimental data and to draw important conclusions from those data about the underlying mechanisms that must be at work.”

Reviewer (B)

“Danny Forger is a highly creative and energetic mathematician who has established an international reputation in circadian rhythms research. ... [his] field of biological clocks is an important and very active one and the work he does is likely to have significant impact in a much broader area because many of the insights apply to more general dynamical systems such as those involved in cell signaling and regulation.”

Reviewer (C)

“...he uses his considerable mathematical talents to deepen our understanding of the molecular basis of important aspects of cellular and organismal physiology. ... As the importance of mathematics and computation in modern life sciences and medicine is increasingly accepted and valued, Danny Forger is well positioned to become one of the field’s leading figures in years to come.”

Reviewer (D)

“...Forger is the complete package. He has a large number of publications, in really good journals. ... He has serious grant money... He has experience working in an experimental laboratory. ... He clearly knows his mathematics... He has won significant awards already. Overall, very impressive indeed.”

Reviewer (E)

“Dr. Forger ranks highly with respect to others at the same level. His recent award as [an] Air Force Young Investigator is especially impressive. ...[his] research spans a couple of areas of mathematical biology, one of which is neuroscience. ... Dr. Forger’s research is very interesting and current, and he is very productive. I enthusiastically recommend his promotion...”

Reviewer (F)

“Professor Forger is well recognized among colleagues. ... I feel that his mathematical insights in combination with applying them to models and his demands for experimental results...provides a ‘fresh breeze’ in the field.”

Reviewer (G)


“...Danny has broad interests and works closely with many experimentalists. The latter requires a special talent since it is very important for the theoretician to learn to speak the language of the experimentalist. Few mathematicians are willing to do this.”

Reviewer (H)

“...he is a remarkable teacher and communicator with [a] strong background both in applied mathematics and biology. He can always provide intuitive and informative explanations to the biologists, mathematicians, engineers, physicists, and chemists to present his concept of biology and mathematics. He has a remarkable ability to use a good metaphor and to adjust his explanations to the level and background of students, audience, and collaborators.”

Summary of Recommendation:

Professor Forger has established himself as a leader in his field, made major contributions to teaching, and carried a substantial load of service. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Daniel B. Forger 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

May 2009