

May 17, 2007

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

Michal R. Zochowski, assistant professor of physics, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of physics, with tenure, College of Literature, Science, and the Arts. (Also being recommended for promotion to associate research scientist in the Biophysics Research Division.)

Academic Degrees:

Habilitation	2002	Institute of Biocybernetics and Biomedical Engineering, Polish Academy of Science
Ph.D.	1995	University of Warsaw
M.Sc.	1993	University of Warsaw

Professional Record:

2001 – present	Assistant Professor, Department of Physics, and Assistant Research Scientist, Biophysics Research Division (BRD), University of Michigan.
1998 – 2001	Postdoctoral Fellow, Department of Molecular and Cellular Physiology, Yale University School of Medicine
1996 – 2000	Assistant Professor, Center for Theoretical Physics, Polish Academy of Science
1996 – 1998	Postdoctoral Fellow, Center for Complex Systems, Florida Atlantic University
1993 – 1996	Assistant, Center for Theoretical Physics, Polish Academy of Science

Summary of Evaluation:

Teaching – Professor Zochowski displays his commitment to Michigan students through classroom teaching, mentoring of researchers, and concentration counseling. While his record is limited in length by his joint Physics/BRD appointment, he has taught honors introductory courses, courses for non-scientists, and upper level biophysics courses. He works well with students and shows real dedication to their success. He has been a very effective concentration counselor, taking a particular interest in the biophysics concentrators. He has a strong interest in interdisciplinary science and a clear understanding of the challenge of educating students across disciplinary boundaries.

Research – Professor Zochowski leads an interdisciplinary research program to study one of the most complex problems in biophysics, the underlying neural dynamics of the brain. In addition to running a neuroscience laboratory with state-of-the-art capabilities, he brings a unique theoretical insight to problems in neural dynamics. The theoretical techniques that he has developed are broadly applicable in neuroscience and he successfully employs these techniques in various collaborative projects with researchers at Michigan's Medical School and other institutions. His research is funded primarily through a major external National Institutes of Health grant. Both his theoretical and experimental contributions are highly regarded by scientists working in neuroscience and in related disciplines.

#### Recent and Significant Publications:

“Measuring properties of asymmetric temporal interdependencies in simulated and biological network,” with R. Dzakpasu, et al., *Chaos*, 16, 2006, 043121.

“Transition from local to global phase synchrony in small world neural network and its possible implications for epilepsy,” with B. R. Percha, et al., *Physical Review E*, 72, 2005, 031909.

“Odorant presentation history dependent oscillations in the olfactory bulb,” with L. B. Cohen, *Journal of Neurophysiology*, 94, 2005, pp. 2667-2675.

“Conditional entropies; phase synchronization and changes in the directionality of information flow in neural systems,” with R. Dzakpasu, *Journal of Physics A: Mathematical and Theoretical*, 37, 2004, pp. 3823-3834.

Service – Professor Zochowski has served on the Graduate Admissions Committee for both units and has served as undergraduate concentration advisor for biophysics and physics majors. He has also performed service at the national level reviewing papers and proposals.

#### External Reviews:

##### Reviewer (A)

“Michal is not the only researcher who can master advanced theoretical methods; what makes him exceptional is his ability to incorporate his physical intuition with the biological knowledge and intuition and to develop new generic models and mathematical analysis methods (like his causal entropy method), to decipher hidden biological principles.”

##### Reviewer (B)

“...Michal has established a[n] active and successful laboratory at the University of Michigan. There are many published and submitted papers and he has mentored a large number of scientists [of their generation]. The biological experiments he has carried out were elegant.”

##### Reviewer (C)

“Michal appears to have a good command of many analytical tools from dynamical systems and also is able to apply these to many biological problems. His work covers a broad area ranging from imaging to analysis of synchronization in networks. ... I think that your department is lucky to have someone like Michal. Our Physics Department has been trying for years to get a biological physicist...”

##### Reviewer (D)

“Dr. Zochowski has an impressive publication record and has assembled a strong research group. ... He is the first researcher in the field to distinguish systematically between phase synchronization and lag synchronization. This achievement makes it possible to understand many previously unexplained phenomena.”

##### Reviewer (E)

“He put forward original Physics-based ideas that have the potential of changing the way we understand the dynamics of complex systems... He is one of the few physicists who run[s] a real neurobiology lab in a Physics department and is thus in the position to formulate novel ideas and actually test them with state-of-the-art techniques.”

Reviewer (F)

“Michals’ [sic] studies in olfaction are excellent. His 2005 Journal of Neurophysiology paper shows that there is a memory of previous sniffing events – outside of adaptation – at the level of the olfactory bulb. ... His recently submitted Journal of Neuroscience manuscript extends this work and cleanly demonstrates a unique role for neurological feedback to the bulb.”

Reviewer (G)

“...he is an excellent scientist and teacher... I support his promotion... His absolute uniqueness is interdisciplinarity...”

Reviewer (H)

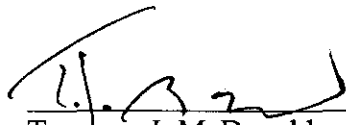
“He is truly outstanding in the novelty and number of his publications. Since his appointment in 2001 as an Assistant Professor at the University of Michigan he has done creative ground breaking work... ..he will be a valuable asset in research, service, and teaching...”

Reviewer (I)

“I am convinced that, based on his record to date, he would easily be promoted and receive tenure at my institution. ...Zochowski’s work is particularly intriguing in that he has zeroed in on some of the most salient problems of our field...”

Summary of Recommendation:

Professor Zochowski has shown intellectual quality, productivity, inventiveness, and leadership in creating and disseminating knowledge in physics and biophysics. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Michal R. Zochowski be promoted to the rank of associate professor of physics, with tenure, in the College of Literature, Science, and the Arts.



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

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