

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Jamie D. Phillips, associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D. 1998 University of Michigan, Electrical Engineering, Ann Arbor, MI
M.S. 1996 University of Michigan, Electrical Engineering, Ann Arbor, MI
B.S. 1994 University of Michigan, Electrical Engineering, Ann Arbor, MI

Professional Record:

2008-present Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2002-2008 Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
1999-2001 Research Scientist, Rockwell Science Center, Thousand Oaks, CA
1998-1999 Post-doctoral Researcher, Sandia National Labs, Albuquerque, NM

Summary of Evaluation:

Teaching: Professor Phillips is a superlative classroom instructor at both the undergraduate and graduate levels and is an excellent mentor for his research students. His success as a classroom instructor was recognized with a 2011 University Undergraduate Teaching Award. Professor Phillips has approached teaching with both passion and the same analytic style that has made him a successful researcher. In particular, his use of active learning methods has aided significantly in capturing the interest and attention of the students. Professor Phillips is very effective in both classroom instruction and research mentoring at not only conveying technical material, but also at inspiring students to exceed their perceived limitations and continuing in their educations and careers. Professor Phillips has graduated 10 Ph.D. students and is currently advising an additional four students. He has also advised three M.S. students and directed several undergraduate major projects.

Research: Professor Phillips' research focuses on optoelectronic materials and devices. He and his students have undertaken in-depth studies of a number of material systems, focusing on the synthesis, characterization, and device applications of these electronic and optoelectronic materials. He was known for his work on quantum dot infrared photodetectors from his graduate work. He has continued research in the infrared detectors with HgCdTe nBn photodetectors and Sb-based quantum dots. HgCdTe infrared detectors currently offer the highest performance for infrared imaging. He is also a recognized expert in the areas of ZnO and intermediate-band solar cells (IBSC). His group provided the first demonstration of an IBSC based on an intermediate band formed via defects in a bulk semiconductor material. This work was highlighted by the pioneers of IBSC in a *Nature Photonics* article in 2011. As noted by external reviewers, Professor Phillips' work combines creativity and scientific soundness.

Professor Phillips has maintained a steady level of research support from government agencies, industries and the University of Michigan throughout the years to support his research programs. A considerable portion of his research funding comes from industry, which indicates the significance and the impact of

his work. His group publishes, on average, five papers per year in refereed journals, many of them are in highly reputable journals in the applied physics and electrical engineering discipline.

Recent and Significant Publications:

- A.M. Itsuno, J.D. Phillips and S. Velicu, "Design of an Auger-suppressed unipolar HgCdTe NBvN photodetector," *Journal of Electronic Materials*, (2012).
- J. Siddiqui, J.D. Phillips, K. Leedy and B. Bayraktaroglu, "Bias-Temperature-Stress Characteristics of ZnO/HfO₂ Thin Film Transistors," *IEEE Transactions on Electron Devices*, 59, 1488-1493 (2012).
- A.M. Itsuno, J.D. Phillips and S. Velicu, "Mid-Wave Infrared HgCdTe nBn Photodetector," *Applied Physics Letters*, 100, 161102 (2012).
- J. Hwang, A.J. Martin, J.M. Millunchick and J.D. Phillips, "Thermal emission in type-II GaSb/GaAs quantum dots and prospects for intermediate band solar energy conversion," *Journal of Applied Physics*, 111, 074514 (2012).
- W. Wang, A. Lin and J. Phillips, "Intermediate-Band Photovoltaic Solar Cell Based on ZnTe:O," *Applied Physics Letters*, 95, 011103 (2009).
- W. Wang, A. Lin, J.D. Phillips and W. Metzger, "Generation and recombination rates at ZnTe:O intermediate band states," *Applied Physics Letters*, 95, 261107 (2009).

Service: Professor Phillips performs extensive professional service. He is an associate editor for the *Journal of Electronic Materials*; has served as organizer and as a program committee member for one of the leading electronic materials research conference; and has also been elected to the committee of the Device Research Conferences, as well as to the executive committee of the electronic materials and processing division in the American Vacuum Society. Since 2005 he served as a guest editor for five special issues of the *Journal of Electronic Materials*. Internally, he has been a chair and member of the EECS Undergraduate Committee, as well as the Graduate Committee, and he served as an undergraduate advisor.

External Reviewers:

Reviewer A: "Professor Phillips has established himself as a leader in the epitaxial growth and device applications of electronic materials including quantum dots, ferroelectrics, superlattices, wide and narrow band gap semiconductors."

Reviewer B: "Prof. Phillips is one of the few researchers in academia actively contributing to HgCdTe infrared detectors and is recognized internationally for his optical absorption models and exploration of new device concepts... Jamie's leadership in the area of IR detector materials is obvious through his group's record of publications..."

Reviewer C: "I have always been very impressed by Jamie's broad knowledge of his field and enthusiastic devotion to excellent science... I have no doubt that Jamie will continue his steep trajectory in scientific leadership based on his depth of knowledge, strong network and abundant energy for scientific discovery."

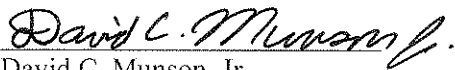
Reviewer D: "Jamie has developed into an internationally visible, strong scientist in the field of quantum dots, semiconductor hetero- and nanostructures and lately oxide based electronics. He has demonstrated excellent research and has achieved internationally respected results in the mentioned fields."

Reviewer E: "Jamie is one of the most talented [junior] researchers on the electronic materials side of exploratory electronic devices that I know of... I consider Dr. Phillips to be in the top tier of materials focused device researchers at similar points in their careers."

Reviewer F: “Professor Phillips is a recognized expert in these two areas...The concept was proposed in 1997, but Professor Phillips is one of the earlier contributors to demonstrate IBSC using the so-called Highly Mismatched Alloys, of which the dilute oxide ZnTe:O is an example.”

Reviewer G: “...The carrier transport issue is especially complicated and subtle, and Professor Phillips has done some very nice work to elucidate this issue through modeling...of carrier transport in IBSCs generally, and in subsequent experimental studies in GaSb/GaAs quantum-dot structures.”

Summary of Recommendation: Professor Phillips is a prominent scientist and has a strong record of research with substantial accomplishments in a number of areas including ZnO materials and devices, intermediate-band solar cell device physics, and HgCdTe infrared detector technology. He is an excellent teacher and well-respected mentor; and he is a leader who contributes both in external and internal service. It is with the support of the College of Engineering Executive Committee that I recommend Jamie D. Phillips for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



David C. Munson, Jr.

Robert J. Vlasic Dean of Engineering
College of Engineering

May 2013