

PROMOTION RECOMMENDATION

The University of Michigan
College of Engineering

Jamie D. Phillips, assistant professor of electrical engineering and computer science, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to associate 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, Michigan
M.S. 1996 University of Michigan, Electrical Engineering, Ann Arbor, Michigan
B.S. 1994 University of Michigan, Electrical Engineering, Ann Arbor, Michigan

Professional Record:

2002-present Assistant Professor, Department of Electrical Engineering and Computer Science,
University of Michigan
1999-2001 Research Scientist, Rockwell Science Center, Thousand Oaks, CA
1998-1999 Postdoctoral Researcher, Sandia National Laboratories, Albuquerque, NM

Summary of Evaluation:

Teaching: Professor Phillips is one of the best teachers in the EECS department. His course rankings are outstanding, and the comments on his teaching by both undergraduate and graduate students are glowing. He has willingly taught introductory undergraduate courses with great success. He has modernized and significantly improved existing graduate classes in the solid-state electronics area. He is also an exceptional research mentor for his research students. Finally, he has worked to help create the next generation of university faculty through a mentored graduate student teaching internship program, studied the effectiveness of this program on undergraduate learning, and has presented these results at an American Society of Engineering Education (ASBE) national meeting.

Research: Professor Phillips is a nationally known junior leader in electronic oxide materials and devices, particularly ZnO, and has also made substantial contributions in HgCdTe technology for improved infrared imaging devices. Successful growth and doping of wide band-gap electronic materials and incorporation of these materials into useful devices is a daunting task that has frustrated more senior researchers. Professor Phillips has already achieved significant success on this front in the ZnO system. He has achieved pioneering results in combining complex ferroelectric oxide materials with semiconducting ZnO to open a wide range of new electronic device possibilities. His results may enable new and improved devices for blue and ultraviolet optoelectronics, improved flat panel displays, and tunable microwave communications devices. He also continues to make significant contributions in the area of HgCdTe infrared detector technology. This field is dominated by researchers in government and defense contractor laboratories, but Professor Phillips is one of a few university researchers who are able to contribute in this field. His scientific work in this area is regarded as highly important to the advancement of this critical infrared imaging technology.

Recent and Significant Publications:

P. Y. Emelie, J. D. Phillips, S. Velicu and C. H. Grein, "Modeling and Design Considerations of HgCdTe Infrared Detectors Under Non-Equilibrium Operation," *Journal of Electronic Materials* 36(8), pp. 846-851 (2007).

- E. Cagin, D. Y. Chen, J. J. Siddiqui and J. D. Phillips, "Hysteretic Metal-Ferroelectric-Semiconductor Capacitors Based on PZT/ZnO Heterostructures," *Journal of Physics D* 40, pp. 2430-2434 (2007).
- J. S. Fu, X. A. Zhu, J. D. Phillips and A. Mortazawi, "Improving Linearity of Ferroelectric-Based Microwave Tunable Circuits," *IEEE Transactions on Microwave Theory and Techniques* 55, pp. 354-360 (2007).
- T. E. Murphy, D. Y. Chen, E. Cagin and J. D. Phillips, "Electronic Properties Of ZnO Epilayers Grown On C-Plane Sapphire By Plasma-Assisted Molecular Beam Epitaxy," *Journal of Vacuum Science and Technology B* 23, pp. 1277-1280 (2005).
- K. Moazzami, J. Phillips, D. Lee, D. Edwall, M. Carmody, E. Piquette, M. Zandian and J. Arias, "Optical Absorption Model for MBE HgCdTe and Application to Infrared Detector Photo Response," *Journal of Electronic Materials* 33, pp. 701-708 (2004).

Service: Professor Phillips' contributions in both departmental and external professional service have been outstanding and well above the level normally expected from an assistant professor. Among his several notable service activities are a long term as an undergraduate academic advisor for the BSEE program, a term as an associate editor for the *Journal of Electronic Materials*, conference committee positions for three prestigious meetings, his recent election to the Executive Committee of the Electronic Materials and Processing Division of AVS, and serving on six NSF proposal review panels. His inclusion of women and under-represented minority students at both the undergraduate and graduate levels in his research has been outstanding and definitely contributes positively to the climate for diversity at the University.

External Reviewers:

Reviewer A: "Dr. Phillips is recognized internationally as an outstanding and energetic researcher in the field of ZnO material growth and devices. ... Recently, Dr. Phillips has done remarkable work on the integration of ZnO with perovskite ferroelectric materials, which has broadened ZnO research into a new area. ... This work has promising potential for multifunctional and tunable devices, as well as for advanced microwave circuits."

Reviewer B: "I continue to be impressed with the quality of his research and technical expertise."

Reviewer C: "...I have continually been impressed with both his research and service contributions to our field, especially considering the relatively short time he has been involved."

Reviewer D: "His expertise and background is exceptional. It covers the entire spectrum of semiconductor science from growth through an extraordinarily wide range of materials characterization techniques up to the modeling, design, fabrication and characterization of many types of electrical, optical, and electro-optic semiconductor devices. ... Dr. Phillips also has shown a keen eye for the most exciting and promising areas of research, as evidenced by his current emphasis on ZnO and on semiconductor ferroelectric thin films..."

Reviewer E: "Dr. Phillips is one of the rising stars in the area of electronic oxide thin films. ... His research activities in the use of perovskite materials as a gate dielectric for ZnO-based thin film transistors ... is [sic] particularly noteworthy. ... Relative to other groups working in the US on ZnO materials, I would rank Dr. Phillips' group among the top five in terms of impact and leadership."

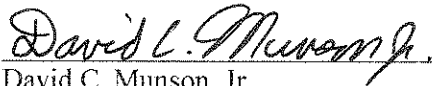
Reviewer F: "Jamie Phillips has compiled a strong record of accomplishment in the epitaxial growth of electronic materials including quantum dots, superlattices, complex oxides, and wide band gap semiconductors. ... His recent publications are particularly impressive in that they are at the forefront of

solid state electronics in terms of combining complex oxides with conventional semiconductors such as ZnO.”

Reviewer G: “It takes special talent and skills to grow wide band gap materials such as ZnO and GaN because they are truly challenging tasks. Not many researchers at universities can grow high quality wide band gap materials for optoelectronic device applications. ... I would rank him among the top few percents among his peers in the field of optoelectronics research, especially ZnO related wide band gap materials and optoelectronic devices.”

Reviewer H: “...Dr. Phillips and his team developed the most detailed description of optical absorption in HgCdTe. This was critical for industry applications of IR focal plane arrays (FPA) for government, industry, and civil uses of IR technology.”

Summary of Recommendation: Professor Phillips is a well known and respected member of the electronic material and device community. He has achieved significant success and visibility in the emerging and potentially very important area of ZnO-based electronics and optoelectronics and is an important scientific contributor to the field of HgCdTe infrared detector technology. He is an excellent teacher and mentor to both graduate and undergraduate students. He has made very substantial contributions in both departmental and external professional service. It is with the support of the College of Engineering Executive Committee that I recommend Jamie D. Phillips for promotion to associate 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

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