

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Mechanical Engineering
Department of Electrical Engineering and Computer Science

Kevin P. Pipe, associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and associate professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering, is recommended for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering.

Academic Degrees:

Ph.D.	2004	Massachusetts Institute of Technology, Electrical Engineering, Cambridge, MA
M.Eng.	1999	Massachusetts Institute of Technology, Electrical Engineering and Computer Science, Cambridge, MA
B.S.	1999	Massachusetts Institute of Technology, Electrical Engineering and Computer Science, Cambridge, MA

Professional Record:

2010 – present	Associate Professor (with tenure), Department of Mechanical Engineering, University of Michigan
2010 – present	Associate Professor (without tenure), Department of Electrical Engineering and Computer Science, University of Michigan
2004 – 2010	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2004 – 2010	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan

Summary of Evaluation:

Teaching: Professor Pipe is an excellent teacher and advisor. He has taught a range of courses, from basic undergraduate to advanced graduate level in the Department of Mechanical Engineering (ME). His performance in the classroom has yielded excellent student evaluations, even in large undergraduate core classes like ME235. His teaching skills and efforts are highly respected and appreciated by the students, as evidenced by the student letters. In addition to being an effective classroom teacher, Professor Pipe is also an excellent advisor and mentor. Since joining Michigan, he has graduated 12 Ph.D. students, with three more currently in the pipeline. In addition, he has advised several Master's students, many of whom have participated directly in his research projects. From the student letters, it is clear that he is well respected and admired as an advisor. Professor Pipe's strong mentorship is also demonstrated by the many papers he has published with his students.

Research: Professor Pipe is a renowned scholar and research leader in the field of thermal transport and thermal electric materials, especially those based on soft matter. He has developed a stellar research program at Michigan with continuous and strong funding from government agencies (NSF, DOD, DOE, NIST, DARPA and AFOSR) and industry, including leading a multidisciplinary DOD MURI program as a PI. He has published over 55 papers (over 25 since his last promotion) in high-impact journals such as *Nature Materials*, *Advanced Materials*, *Physical Review Letters* and *Applied*

Physics Letters, and attracted numerous citations; he also was awarded four patents. These facts clearly attest to the visibility and impact of his work. Professor Pipe has been presenting his research findings at the important conferences in his field and was invited to give talks at various institutions. Comments from the external reviewers clearly testify that his publications are of high quality and impact and that he is one of the best researchers and leaders in his field. It is obvious that Professor Pipe has developed an outstanding reputation in research, both nationally and internationally. He is the recipient of a DARPA Young Faculty Award and the ME Department Excellent Faculty Award.

Recent and Significant Publications:

- K. Zhang, A. Yadav, L. Shao, R. Bommen, J. Zhao, S. Velicu, and K. P. Pipe, "Thermoelectric properties of MBE-grown HgCdTe-based superlattices from 100K to 300K," *AIP Advances*, in press (2016).
- L. Shao, A. Raghavan, G.-H. Kim, L. Emurian, J. Rosen, M. C. Papaefthymiou, T. F. Wenisch, M. M. K. Martin, and K. P. Pipe, "Figure-of-merit for phase-change materials used in thermal management," *International Journal of Heat and Mass Transfer* 101, 764 (2016).
- G.-H. Kim, J. Kim, and K. P. Pipe, "Humidity-dependent thermoelectric properties of poly (3,4-ethylenedioxythiophene):poly(styrene sulfonate)," *Applied Physics Letters* 108, 093301 (2016).
- M. S. Kwon, Y. Yu, C. Coburn, A. W. Phillips, K. Chung, A. Shanker, J. Jung, G. Kim, K. Pipe, S.R. Forrest, J. H. Youk, J. Gierschner, and J. Kim, "Suppressing molecular motions for enhanced room-temperature phosphorescence of metal-free organic materials," *Nature Communications* 6, 8947 (2015).
- V. Rashidi and K. P. Pipe, "Contributions of strain relaxation and interface modes to thermal transport in superlattices," *Computational Materials Science* 107, 151 (2015).
- S. Biswas, O. Shalev, K. P. Pipe, and M. Shtein, "Chemical vapor jet deposition of parylene polymer films in air," *Macromolecules* 48, 5550 (2015).
- G.-H. Kim, D. Lee, A. Shanker, L. Shao, M. S. Kwon, D. Gidley, J. Kim, and K. P. Pipe, "High thermal conductivity in amorphous polymer blends by engineered interchain interactions," *Nature Materials* 14, 295 (2015).
- L. Shao and K. P. Pipe, "Amplification and directional emission of surface acoustic waves by a two-dimensional electron gas," *Applied Physics Letters* 106, 023106 (2015).
- Y. Zhao, D. Nothorn, A. Yadav, K.-H. An, K. P. Pipe, and M. Shtein, "Effects of substrate topography on current injection and light emission properties of organic light emitting devices," *Organic Electronics* 15, 3529 (2014).

Service: Professor Pipe is an outstanding citizen, providing excellent service and leadership to Michigan and to the technical community. Internally, Professor Pipe has served with distinction. He has done an exceptional job as the ME associate chair for graduate education (ACGE) and is currently an elected member of the ME Department Advisory Committee. He has made primary contributions to diversity and climate as the ME ACGE and the director of the College of Engineering Bridge-to-Ph.D. Program. Externally, he has demonstrated leadership being a symposium organizer for many conferences in his field, and served as the general chair and organizer of the 14th International Conference on Phonon Scattering in Condensed Matter (PHONONS 2012), which was held in Ann Arbor. His service and leadership record is indeed impressive and has exceeded expectation.

External Reviewers:

Reviewer A: "Kevin's excellent contributions in polymer thermal and thermoelectric transport place him as an international leader in this emerging area. And a leader he is!"

Reviewer B: “Kevin Pipe is on an exceptional career trajectory and is highly distinguished in his peer group through his ability to pick challenging problems and help assemble diverse scientific teams. Most importantly, he has a track record of delivering outstanding research results to the archival literature... .”

Reviewer C: “Dr. Pipe’s group has introduced a novel approach to improve the ZT of the organic semiconductors and conducting polymer. This technique has opened a new direction in thermoelectric research. ...He can be considered as a leading expert in organic thermoelectric material. This is reflected by his plenary talk at PHONONS2015.”

Reviewer D: “The applicant’s work has very good visibility and impact. More broadly speaking, I am impressed with the applicant’s approach to modify the property of materials by targeted, molecular design. This includes the work on controlled doping of thermoelectric polymer materials (Nat. Mat. 2013) – a very high-impact result as it presents a breakthrough in the development of high-performance, low-cost thermoelectrics.”

Reviewer E: “Dr. Kevin Pipe has established a world class level of scholarly achievement, service, and teaching at Michigan.”

Reviewer F: “Kevin Pipe’s work over the last decade has pushed the frontier of this field, both through the examination of different classes of materials (organics, skutterdites, HgCdTe, carbon nanotubes) shows a tremendous range and also deep understanding of material properties and engineering of hitherto unexplored structures. The breadth of his program is impressive.”

Reviewer G: “Professor Pipe is clearly a well-known and respected scholar in the nanoscale heat transfer community, representing a unique scholar with strong expertise in the thermal, electrical and optical domains. He has a very strong reputation and is clearly a strong member of our community.”

Summary of Recommendation: Professor Pipe has contributed significantly to all aspects of research, teaching and service. He has developed a stellar research program and publication record. His work has major impact, well-recognized and praised by the external reviewers. He is an excellent teacher, advisor and mentor to our students. He is a leader and great citizen who has contributed significantly both in external and internal service. It is with the support of the College of Engineering Executive Committee that I recommend Kevin P. Pipe for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, and professor of electrical engineering and computer science, without tenure, Department of Electrical Engineering and Computer Science, College of Engineering.



Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

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