

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Diann E. Brei, associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering, is recommended for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering.

Academic Degrees:

Ph.D. 1993 Arizona State University, Mechanical Engineering, Phoenix, AZ
B.S. 1988 Arizona State University, Computer Systems Engineering, Phoenix, AZ

Professional Record:

2001 – present Associate Professor (with tenure), Department of Mechanical Engineering, University of Michigan
1994 – 2001 Assistant Professor, Department of Mechanical Engineering, University of Michigan

Summary of Evaluation:

Teaching: Professor Brei has regularly taught design and manufacturing undergraduate core courses and has served as the area coordinator for the Design and Manufacturing Group. She has devoted significant effort toward continuous improvement of these courses, creating new instructional material and mentoring new faculty and staff that joined the instructional teams. Her effort and accomplishments have been recognized with various teaching awards, including the Pi Tau Sigma Best Professor, Ruth and Joel Spira Outstanding Teaching Award, National Multiple Sclerosis Society Da Vinci Award, ASEE Best Paper Award, and the ME Teaching Incentive Award. At the graduate level, Professor Brei introduced two new classes that have benefited our students greatly: the Smart Materials and Structures course and the Electromechanical Design course. Professor Brei has graduated seven Ph.D. students and is currently advising six more. Her graduate students have been publishing with her in journals and conference proceedings. It is clear her students appreciate Professor Brei for being an effective teacher and caring advisor. Her mentorship is also demonstrated by the many awards that her students have earned over the years, including the national SMASIS and ICAST best paper awards, NSF and NASA fellowships, the William Mirsky Memorial Award, UM Outstanding Graduate Student Instructor and UM Distinguished Leadership Awards.

Research: Professor Brei's research expertise is in the field of Smart Materials and Structures (SMS), with a focus on developing methodologies and technologies for device design. She is especially well known, nationally and internationally, for the design and manufacturing of devices employing shape memory alloys. She has established and sustained an exceptionally strong research program at Michigan, funded by various agencies and industries. Her effort in founding and now renewing the GM/U-M SMS Collaborative Research Laboratory (CRL) is especially impressive. Professor Brei has been publishing her research findings in reputable journals in her field, but more importantly, she has established herself as a leading researcher making significant impact on the technical community and our society through translational research. This is evidenced by her extraordinary record of licensed patents; patents that have found their way into actual technology in the marketplace. Through her outstanding efforts and leadership, Professor Brei has made special contributions in building the SMS scientific community, stimulating progress in the field from basic research through technology transfer into industrial application. This has impacted the SMS field enormously, establishing it as a popular and sustainable research discipline for researchers and engineers worldwide, in academia, government labs, and industry.

For her accomplishments, Professor Brei has been honored with numerous recognitions, such as ASME Fellow, AIAA Associate Fellow, College of Engineering Ted Kennedy Team Excellence Award, Engineering Award for Outstanding Accomplishment in Research and Education, various best paper and hardware awards, and invitations to be a keynote speaker at international conferences.

Recent and Significant Publications:

- Miyasaka, E. A., Okawada, M., Herman, R., Utter, B., Luntz, J., Brei, D., Teitelbaum, D.H., 2011, "Flow Through a Mechanical Distraction Enterogenesis Device: a Pilot Test," *Journal of Surgical Research*, Vol. 170(2).
- Miyasaka, E. A., Okawada, M., Utter, B., Maria, H., Luntz, J., Brei, D., Teitelbaum D. H., October 2010, "Application of Distractive Forces to the Small Intestine: Defining Safe Limits." *Journal of Surgical Research*, Vol. 163, pp. 169-175.
- Redmond, J., Brei, D., Luntz, J., Browne, A., Johnson, N., Strom, K., June 2010, "The Design and Experimental Validation of an Ultrafast SMART (Shape Memory Alloy ReseTable Latch)," *ASME Journal of Mechanical Design*. Vol. 132 (6) 061007.
- Pathak, A., Brei, D., Luntz, J., March 2010, "Transformation strain based method for convective heat transfer characterization from Shape Memory Alloy wires," *Smart Materials and Structures*, Vol.19 (3). 035005.
- Miyasaka, E. A., Okawada, M., Utter B., Maria, H., Yang, W., Luntz, J., Brei, D., Teitelbaum, D. H., February 2010, "Use of Distractive Forces to Lengthen Small Bowel: Determination of Safe Levels of Applied Force." *Journal of Surgical Research*, Vol. 158 (2), pp. 256-257.
- Alexander, P. W., Brei, D., Halloran, J. W., July 2007, "DEPP Functionally Graded Piezoceramics via Micro-Fabrication by Co-Extrusion," *Journal of Materials Science*, 32 (14), pp. 5805-5814.
- Spencer, A. U., Sun, X., El-Sawaf, M., Haxhija, E. Q., Brei, D. E., Luntz, J., Yang, H., Teitelbaum, D. H., December 2006, "Enterogenesis in a clinically feasible model of mechanical small bowel lengthening," *Surgery*, Vol. 140 (2), pp. 212-220.
- Cannon, B., Brei, D., February 2004, "Piezoceramic Hollow Fiber Active Composites," *Composite Science and Technology*, Vol. 64 (2), pp. 245-261.
- Ervin, J. D., Brei, D., January 2004, "Dynamic Behavior of Piezoelectric Recurve Actuation Architectures," *ASME Journal of Vibration and Acoustics*, Vol. 126 (1), pp. 37-46.
- Alexander, P. W., Brei, D., October 2003, "Piezoceramic Telescopic Actuator Quasi-static Experimental Characterization," *Journal of Intelligent Material Systems and Structures*, Vol. 14 (10), pp. 643-656.

Service: Professor Brei has been an outstanding citizen, actively involved in serving the University and the professional community. She has served on various important departmental committees, such as the Graduate Program Committee, the Curriculum Committee, Faculty Search Committee and Undergraduate Program Committee. At the University level, she has been a member of the Rackham Graduate School Executive Committee which recently created the continuous enrollment policy. In addition to serving Michigan, Professor Brei has been an active volunteer and leader to the two professional societies that house the field of Smart Materials and Structures: the American Society of Mechanical Engineers (ASME) and American Institute of Aeronautics and Astronautics (AIAA). Professor Brei was a founding member of the AIAA Adaptive Structures Technical Committee and has served as the technical committee chair, vice chair, secretary, and adaptive structures conference technical and general chair. She is a member of the ASME Aerospace Division Executive Committee and an associate editor for the *Journal of Mechanical Design*. One of Professor Brei's most outstanding contributions to the community was co-founding and co-organizing the highly successful and visible ASME SMASIS conference. Through these activities, Professor Brei has demonstrated outstanding leadership in building and sustaining the Smart Materials and Structures research community and shape the future of the technical field.

External Reviewers:

Reviewer A: "...I believe her work in the community is exemplary and above and beyond what one would expect from a full professor."

Reviewer B: "...there is no doubt in my mind that she is one of the finest researchers in the smart structures field."

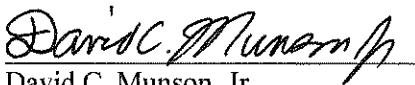
Reviewer C: "...comparing to equivalent levels of colleagues I know in France/Europe, she is really on the top."

Reviewer D: "I consider Diann's work to be of the highest quality...Diann's research had demonstrated the very high level of excellence we require...I believe the projects Diann reviewed in her casebook to be very relevant to the required reinvention of the automobile to meet the needs and requirements of the 21st century. They will have a significant impact on our industry."

Reviewer E: "There is a small but growing cadre of people internationally who have engaged themselves in this task and Professor Brei is one of the 'global' leaders in this group and I would rate her clearly in the top 1% of this field..."

Reviewer F: "To summarize, I believe that she is among the most forward looking practitioners in this area."

Summary of Recommendation: Diann E. Brei has contributed significantly to all aspects of teaching, research, and service. She has been a leader in the teaching and improving of our undergraduate design and manufacturing core courses and has developed two important graduate level classes. As a researcher, Professor Brei is well known and is recognized as a leader in the field of Smart Materials and Structures, nationally and internationally. In service, Professor Brei has been an outstanding citizen and leader serving UM and the professional community with distinction. It is with the support of the College of Engineering Executive Committee that I recommend Diann E. Brei for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering.



David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2012