

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Wei Lu, 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. 2001 Princeton University, Materials Science and Engineering, Princeton, NJ
Ph.D. 1998 Tsinghua University, Solid Mechanics, Beijing, P.R. China
M.S. 1995 Tsinghua University, Solid Mechanics, Beijing, P.R. China
B.S. 1994 Tsinghua University, Engineering Mechanics, Beijing, P.R. China

Professional Record:

2007 - present Associate Professor (with tenure), Department of Mechanical Engineering, University of Michigan
2001 - 2007 Assistant Professor, Department of Mechanical Engineering, University of Michigan

Summary of Evaluation:

Teaching: Professor Lu is a highly-regarded teacher and advisor. He has taught a mix of undergraduate and graduate level courses at Michigan. These include undergraduate core courses Mechanical Behavior of Materials and Introduction to Solid Mechanics, a large and popular technical elective, Strength of Materials, and a specialty graduate class that he developed, Nano/Micro Structure Evolution. He has consistently received high marks on his Q1/Q2 teaching evaluations. Professor Lu has also demonstrated excellence in student advising and mentoring. He has graduated six Ph.D. students and is currently supervising six more. He has also advised two M.S. students and a number of undergraduate student projects. His students consistently publish with him in high quality journals, showing his strong mentorship. Student letters testify that Professor Lu is an effective teacher who is enthusiastic, organized, and articulate, and is an outstanding advisor who has provided them with excellent guidance.

Research: Professor Lu is an eminent scholar and a leading researcher in mechanics and materials, with a major focus on the multi-scale and multi-physics approaches to address emerging challenges. He has made significant contributions to the scientific understanding and engineering application of systems involving interface motion, structure evolution, deformation, multiple energetic forces and kinetic processes. The methods and outcomes that Professor Lu developed have been well recognized by the technical community for their scholarly elegance and connection to the essential physics of the applications at hand. His work on the modeling and computation of self-assembled nano systems is of high scholarly value and has a broad range of potentials in nano-fabrication and nanoscale biodiagnostic device applications. Through developing a realistic 3D mechanical-thermal-electrochemical framework for prediction and optimization of the battery performance and cycle life, his group has obtained better understanding of the integrated mechanical-thermal-electrochemical characteristics of Li-ion battery. These results have been integrated into and played an important role in the design of next generation electrical vehicles.

Professor Lu has developed a strong research program here, funded by a mix of government agencies and industry. He is currently the PI and co-director of the UM-GM Advanced Battery Coalition for Drivetrains (five year, \$5.7 M research grant). He has an outstanding publication record with nearly 80

archival journal papers (62 since joining Michigan) in high impact and high quality journals; his papers are well cited by his peers. His accomplishments are also recognized by the various awards he received including the U of M Faculty Recognition Award, the Robert M. Caddell Memorial Research Achievement Award, and the NSF CAREER Award. He is also recognized by the many invited talks he presents at various conferences, workshops, and institutions, including one at the National Academies Keck Futures Initiative Conference. The quality and impact of his work are well respected by his peers and praised in external letters.

Recent and Significant Publications:

- H. Gong, W. Lu, L. Wang, G. Li and S. Zhang, "The effects of substrate size and temperature on the deposition of Cu clusters on a Si substrate," *Journal of Applied Physics*, 112, 024903, 2012.
- S. Lee and W. Lu, "Using elastic light scattering of red blood cells to detect infection of malaria parasite," *IEEE Transactions on Biomedical Engineering*, 59, 150-155, 2012.
- K. D. Li, Q. Wei, L. M. Wang and W. Lu, "Dynamics of nanoscale void/fiber assembly formation in irradiated amorphous materials," *International Journal for Multiscale Computational Engineering*, 10, 109-116, 2012.
- S. Lee, L.M. Wang and W. Lu, "Formation of ordered nanodroplet chains on a solid surface by enhanced surface diffusion and shadow effect," *Surface Science*, 606, 659-663, 2012.
- S. Lee and W. Lu, "Computing light scattering spectrum of microparticles toward disease diagnosis," *Journal of Computational and Theoretical Nanoscience*, 9, 409-413, 2012.
- S. Lee and W. Lu, "Surface instability, ripple formation, and spontaneous transition to chains of dots by competing kinetics," *Computational Materials Science*, 50, 2706-2711, 2011.
- Z. Zhao and W. Lu, "Growing large nanostructured superlattices from a continuum medium by sequential activation of self-assembly," *Physical Review E*, 83, 041610, 2011.

Service: Professor Lu has been an outstanding citizen and leader in serving the University of Michigan and the technical community. At the university level, he has served as the chair of the Senate Assembly Financial Affairs Advisory Committee, and as member of the Senate Assembly Committee for a Multicultural University. At the college level, he is an elected member of the College Senate Assembly, former member of the Engineering Nominating Committee, and Library Advisory Committees. He has also served on college tenure and/or reappointment casebook committees (chair of three). At the department level, he is the coordinator for the Materials and Solid Mechanics Area, and a member of the Faculty Search Committee. He has been on both the Graduate Admissions Committee and Graduate Program Committee for many years. In addition, Professor Lu has also been very active in his technical community, providing service and leadership. He is a fellow of the American Society of Mechanical Engineers (ASME). He has organized symposiums in various conferences in his field, and has been very active in several technical committees in ASME and the Materials Research Society (MRS). He serves as associate editor for the *Journal of Computational and Theoretical Nanoscience* and is on the editorial board of several other journals.

External Reviewers:

Reviewer A: "...he has created a substantial and diverse body of research that shows originality and maturity. He has a strong publication record, and he is active within the community."

Reviewer B: "...in the general area of applied and computational mechanics I believe that Wei is one of the top academic researchers that are addressing important and timely aspects in nanomechanics and nanoscience...he is helping to reshape the field of applied mechanics and I have over the years considered him initially as one of the most important faculty [of his cohort] in this area, and now, with equal enthusiasm, as one of the most productive and creative mid-career academics in applied

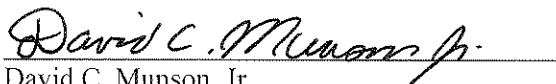
mechanics...These are all fundamental studies with important scholarly and technological impact that are helping to set new standards for assembly and patterning research.”

Reviewer C: “The 5 papers you sent to me are characteristic of his work, each representing a combination of insightful theoretical modeling, well performed numerical simulations and experiments on a topical problem in nano- or biomechanics with important applications... Prof. Wei Lu has made important contributions to modeling and simulation of dynamic evolution of nanoscale phases and multilayers systems, played substantial leadership on the highly visible battery research effort at U of M and is a rising star in the field of nanomechanics.”

Reviewer D: “Prof. Lu presented a very novel and exciting mechanism to generate perfectly ordered nanostructure patterns over a large area by activating self-assembly sequentially...His work sets a new standard for patterning research...Professor Lu’s work so far has been highly original and creative...He will be a new leader in the field of mechanics.”

Reviewer E: “Dr. Lu is an internationally recognized leading figure in modeling evolution of nano and micro [sic] structures.”

Summary of Recommendation: Professor Lu is an eminent scholar and a renowned researcher in mechanics and materials. He has an excellent publication record and has developed a strong research program at Michigan. Professor Lu is a well-respected and effective teacher and an excellent advisor. He has been an outstanding citizen and leader, contributing to the university and the professional communities with a wide variety of activities. It is with the support of the College of Engineering Executive Committee that I recommend Wei Lu 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 2013