

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

John E. Allison, professor of materials science and engineering, without tenure, Department of Materials Science and Engineering, College of Engineering, is recommended for the granting of tenure to be held with his title of professor of materials science and engineering, Department of Materials Science and Engineering, College of Engineering.

Academic Degrees:

Ph.D. 1982 Carnegie-Mellon University, Metallurgical Engineering and Materials Science,
Pittsburgh, PA
M.S. 1977 Ohio State University, Metallurgical Engineering, Columbus, OH
B.S. 1972 US Air Force Academy, Engineering Mechanics, Colorado

Professional Record:

2010-present Professor (without tenure), Department of Materials Science and Engineering, University of Michigan
1996-2000 Adjunct Professor, Department of Chemical and Materials Science, Wayne State University, Detroit, MI
1991-1992 Visiting Scholar, Department of Materials Science and Engineering, Monash University, Melbourne, Victoria, Australia
1989-2010 Adjunct Professor, Department of Materials Science and Engineering, University of Michigan
1983-2010 Senior Technical Leader, Research and Advanced Engineering, Ford Motor Company, Dearborn, MI
1982-1983 Visiting Scientist, Physical Metallurgy Department, Brown Boveri and Company, Baden, Switzerland
1975-1977 Structural Integrity Engineer/Captain (USAF), Structural Integrity Branch, Structural Mechanics Division, Air Force Flight Dynamics Laboratory, Wright Patterson Air Force Base, OH
1972-1975 Non-destructive Testing Research Engineer/First Lieutenant (USAF), Non-destructive Evaluation Branch, Metals and Ceramics Division, Air Force Materials Laboratory, Wright Patterson Air Force Base, OH

Summary of Evaluation:

Teaching: Professor Allison has taught two quite different courses since arriving in Fall 2010. The first is MSE 220, a large introductory materials science course taken by both materials science and engineering (MSE) majors and by many other 2nd year students in the college. He has also twice taught a graduate level materials science course, MSE 520, that is open to seniors as well as graduate students and which covers mechanical behavior of materials. In both classes students tell us that he is an energetic and engaging instructor who integrates examples from industry into the classroom. Students have given him very good evaluations in both courses. Professor Allison's graduate students uniformly praise him as an exceptional mentor and research advisor. They cite his willingness to spend considerable time with each of them and his interest in promoting a very positive group environment. All report a very positive attitude regarding the importance of their work and their confidence in making important contributions to research.

Research: Professor Allison's record of scholarly accomplishment is outstanding. He had a highly productive career as a materials scientist and research leader at the Research Laboratories of Ford Motor Company. During his time there he led a research team that twice won the Henry Ford Technology Award. In 2011 Professor Allison was elected to the National Academy of Engineering, arguably the most distinguished honor in the engineering profession. His excellence and impact in research is further amply demonstrated by his publication record of over 100 journal articles and many papers in conference proceedings, and many keynote presentations around the world.

Professor Allison has demonstrated in spectacular fashion that he can indeed transition from corporate research to building a world-class research effort in academia. Since his arrival in the College of Engineering in 2010, Professor Allison has successfully assembled large multidisciplinary teams of faculty focused on the emerging field of Integrated Computational Materials Engineering (ICME). His success rate in attracting funding to support this effort has been phenomenal. He is now the principal investigator for research programs totaling more than \$15M. Two major grants currently anchor this new direction for research: the recently awarded DOE-BES Software Innovation Center for Integrated Multi-scale Modeling of Structural Metals and the Office of Naval Research funded program on the Integration of Advanced Analysis and Materials Research: Capturing Process Sensitive Materials Information in Compact, Computationally Efficient Models. This funded research, and in particular the close collaboration that Professor Allison has both stimulated and nurtured, is having and will continue to have a transformative impact on materials research both at Michigan and in the larger science and engineering community.

Recent and Significant Publications:

- J. Wang, M. Li, J. Allison and P. D. Lee, "Multiscale Modeling of the Influence of Fe Content in a Al-Si-Cu Alloy on the Size Distribution of Intermetallic Phases and Micropores," *Journal of Applied Physics*, 107 (061804) 2010.
- R. Zhang, M. Li and J. Allison, "Phase-field Study on the Influence of Solute Interactions on Solidification Processes in Multicomponent Alloys," *Computational Materials Science*, 47, p. 832, (2010).
- J. Song, S.-M. Xiong, M. Li and J. Allison, "In-Situ Observation of Tensile Deformation of High-Pressure Die-cast Specimens of AM50 Alloy," *Materials Science and Engineering: A*, Volume 520, Issue 1-2, p 197, 2009.
- J. S. Wang, P. D. Lee, R. W. Hamilton, M. Li and J. E. Allison, "The Kinetics of Fe-Rich Intermetallic Formation in Aluminium Alloys: In-Situ Observation," *Scripta Materialia*, 60 (7), p. 516, (2009).
- X. Zhu, J. W. Jones and J. E. Allison, "Effect of Frequency, Environment and Temperature on Fatigue Behavior of E319 Cast Aluminum Alloy: Small Crack Propagation," *Metallurgical and Materials Transactions*, Vol. 39A, p. 2666, 2008.
- X. Zhu, J. W. Jones and J. E. Allison, "Effect of Frequency, Environment and Temperature on Fatigue Behavior of E319 Cast Aluminum Alloy: Stress Controlled Fatigue Life Response," *Metallurgical and Materials Transactions*, Vol. 39A, p. 2681, 2008.
- Z.-P. Guo, S.-M. Xiong, B.-C. Liu, M. Li and J. Allison, "Effect of Process Parameters, Casting Thickness, and Alloys on the Interfacial Heat-Transfer Coefficient in the High-Pressure Die-Casting Process," *Metallurgical and Materials Transactions*, Vol. 39A, 2008.

Service: Professor Allison's record of service and leadership to the university community and to the larger materials science and engineering community clearly demonstrates his achievement of and commitment to the level of professional service expected for the rank of professor. He has been tireless in his efforts to create a center for ICME. He has served on the Undergraduate Committee, the Graduate Committee and the Chair's Advisory Committee. He recently chaired an ad hoc committee that reviewed mathematics needs in the MSE curriculum. He is heavily involved in service with the National Academy,

the National Materials Advisory Board, and professional societies such as The Minerals, Metals & Materials Society, the American Society for Metals, and the American Institute of Mining, Metallurgical and Petroleum Engineers.

External Reviewers:

Reviewer A: "John possesses a profound understanding of material processing-structure-property-performance relations and is at the vanguard of the use of multi-scale computer models to develop new materials."

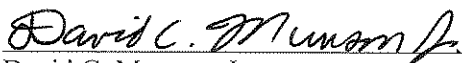
Reviewer B: "His work on the development of a 'virtual casting methodology' for Al-Si alloys in Ford is an outstanding example, which has triggered the current worldwide interest in integrated computational materials engineering as a new tool to accelerate the design and incorporation of new materials into the market...Allison is one of the leading scientists in the world in the area of Structural Materials Engineering..."

Reviewer C: "Professor Allison is a world-class expert on light alloys. He is one of the few researchers worldwide who have a sustained record of solving challenging problems in the field of light alloys. His international standing is significantly higher than his peer [sic] in USA, UK, Canada, Norway, Japan, Australia and Germany."

Reviewer D: "John has made substantial contributions to quantifying our understanding of the influence of microstructure on materials properties with a focus on practical problems such as fatigue. His papers on Mg alloys...metal matrix composites...fatigue in aluminum alloys...are classics."

Reviewer E: "[Professor Allison] is, first and foremost, a leader in the field of Integrated Computational Materials Engineering (ICME)...I know of few people more effective at developing a vision, building the right team, obtaining buy-in, and getting results."

Summary of Recommendation: Professor John Allison is an excellent teacher and mentor and a highly successful researcher and research leader who enjoys an exceptional national and international reputation in the emerging field of computational materials engineering. It is with the support of the College of Engineering Executive Committee that I recommend John E. Allison for the granting of tenure to be held with his title of professor of materials science and engineering, Department of Materials Science and Engineering, College of Engineering.



David C. Munson, Jr.

Robert J. Vlasic Dean of Engineering
College of Engineering

May 2013