

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Mechanical Engineering

Wenda Tan, assistant professor of mechanical engineering, Department of Mechanical Engineering, College of Engineering, is recommended for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2014	Purdue University, Mechanical Engineering, West Lafayette, IN
M.S.	2007	Tsinghua University, Mechanical Engineering, Beijing, China
B.S.	2005	Tsinghua University, Mechanical Engineering, Beijing, China

Professional Record:

2021 – present	Assistant Professor, Department of Mechanical Engineering, University of Michigan
2021 – 2021	Associate Professor (with tenure), Mechanical Engineering, University of Utah, Salt Lake City, UT
2015 – 2021	Assistant Professor, Mechanical Engineering, University of Utah, Salt Lake City, UT

Summary of Evaluation:

Teaching: Since joining UM in 2021, Professor Tan has taught a variety of courses, including ME350 *Design & Manufacturing II*, ME450 *Design & Manufacturing III*, and ME586 *Laser Materials Processing*, both at the undergraduate and graduate levels. Students consistently rate his teaching highly, with an average score of 4.63 and 4.68 for Q1 and Q2, respectively. Professor Tan has made significant changes to the ME586 course structure, integrating modeling tools to enhance students' comprehension of manufacturing processes. He is praised by both undergraduate and graduate students for his effective and approachable teaching style. Professor Tan has graduated two Ph.D. students and has another six in progress. He also serves as a member of six additional Ph.D. committees and he is active in advising master's and undergraduate students.

Research: Professor Tan is an expert in computational modeling and simulation of manufacturing processes, with a focus on laser-based additive manufacturing and welding. His research group has developed advanced models in this field and is now expanding their applications to other manufacturing processes such as metal binder jetting additive manufacturing and casting. With over 30 journal articles, 19 of which were published after joining the University of Utah faculty in 2015, Professor Tan's research is well supported by various sources including NSF, DoD, NASA, and industry. He has been part of over \$7M in past and current grants, of which \$3.7M is his share, with another \$2.1M (of \$4M total) in pending grants.

Through his work, Professor Tan has significantly contributed to understanding defect mechanisms in laser powder bed fusion (LPBF) additive manufacturing, pioneered microstructural modeling of LPBF, and developed industry-relevant methods for improving laser welding of dissimilar metals. His models have received accolades at an Additive Manufacturing Benchmark Challenge organized by NIST, emphasizing his leadership in the field. Professor Tan's publications have made a significant impact on both scientific and industrial practices, with a notable 2,338 citations and an h-index of 20 according to Google Scholar. His pioneering work in computational modeling has garnered recognition, establishing him as a prominent figure in his field.

Recent and Significant Publications:

- Kamat, S, Li, X, Stump, B, Plotkowski, A, Tan, W, "Multi-physics modeling of grain growth during solidification in electron beam additive manufacturing of Inconel 718," *Modelling and Simulation in Materials Science and Engineering*, 31: 104020, 2023.
- Huang, W, Cai, W, Rinker, T, Bracey, J, Tan, W, "Effects of laser oscillation on metal mixing, microstructure, and mechanical property of aluminum-copper welds," *International Journal of Machine Tools and Manufacture*, 188: 104020, 2023.
- Sarswat, P, Sarkar, S, Murali, A, Huang, W, Tan, W, Free, M, "Design, fabrication and evaluation of Fe-Mn-Mo-Zr-Ti-V-B type additive manufactured mixed metal boride ceramics," *Applied Surface Science Advances*, 9: 100247, 2022.
- Mostafaei, A, Elliott, A, Barnes, J, Li, F, Tan, W, Cramer, C, N, Nandwana, P, Chmielus, M, "Binder jet 3D printing: Process parameters, materials, properties, modeling, and challenges," *Progress in Materials Science*, 119: 100707, 2021.
- Li, X, Guo, Q, Chen, L, Tan, W, "Quantitative investigation of gas flow, powder-gas interaction, and powder behavior under different ambient pressure levels in laser powder bed fusion," *International Journal of Machine Tools and Manufacture*, 170: 103797, 2021.

Service: Professor Tan has excelled in various service roles during his career. In his department, he contributed significantly to faculty search and seminar committees, as well as strategic planning efforts. At the college level, he actively participated in the development of the Global Automotive and Manufacturing Engineering (GAME) program and was involved in the Freshman Scholarship Review Committee. He holds an editorial role at the *Journal of Manufacturing Processes* and remains active in professional societies, including the American Welding Society (AWS) and the Minerals, Metals and Materials Society (TMS). Furthermore, he has dedicated efforts to promoting STEM education among K-12 students, particularly focusing on girls in collaboration with the Society of Women Engineers (SWE) to integrate manufacturing education modules into their outreach events. Professor Tan's dedication to academic, professional, and outreach initiatives make him an invaluable asset to the community.

External Reviewers:

Reviewer A: "Based on the above narrative, I believe Prof. Wenda Tan is leading a strong research program in the additive manufacturing area and also mentoring future leaders. If Wenda applies for a position in our university, he will be offered an associate professor with tenure based on his achievements so far."

Reviewer B: “The significance of Professor Tan’s work is that he has not only produced models that both accurately reflect important features of manufacturing processes, but he also uses these computational advances to shed light on difficult or impossible to measure phenomena that impact quality and performance.”

Reviewer C: “Wenda has been constantly performing research works with exceptional quality. His papers and presentations always include excellent experimental & numerical results and thorough analyses. His group has been capable of developing its own multi-physics simulation codes based upon first principles instead of simply using commercial software packages, which differentiated him from other researchers significantly.”

Reviewer D: “I find that Dr. Tan is aggressively seeking research funding, mentoring graduate and undergraduate students, publishing peer-reviewed papers in mainstream journals, and making presentations of research results in professional meetings.”

Reviewer E: “Professor Tan’s professional accomplishments in scholarship, education, and service leadership measure well with those of many other established scholars. In summary, it is my professional opinion that Dr. Tan has demonstrated a reasonable level of scientific accomplishments and professional leadership in the field of materials and advanced manufacturing.”

Summary of Recommendation: Professor Tan has demonstrated exceptional performance in teaching, research, and service. Additionally, he actively supports the college’s dedication to fostering diversity, equity, and inclusion. It is with the support of the College of Engineering Executive Committee that I recommend Wenda Tan for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering.



Steven L. Ceccio, Ph.D.
Interim Dean of Engineering
Vincent T. and Gloria M. Gorguze Professor
of Engineering
College of Engineering

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