

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Civil and Environmental Engineering

Ann E. Jeffers, assistant professor of civil and environmental engineering, Department of Civil and Environmental Engineering, College of Engineering, is recommended for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.

Academic Degrees:

| | | |
|-------|------|--|
| Ph.D. | 2009 | Virginia Polytechnic Institute and State University, Civil Engineering, Blacksburg, VA |
| M.S. | 2005 | Virginia Polytechnic Institute and State University, Civil Engineering, Blacksburg, VA |
| B.S. | 2004 | University of Pittsburgh, Civil Engineering (<i>Summa Cum Laude</i>), Pittsburgh, PA |

Professional Record:

| | |
|----------------|---|
| 2009 – present | Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan |
| 2004 – 2009 | Research and Teaching Assistant, Department of Civil and Environmental Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA |
| 2003 – 2004 | Undergraduate Teaching Assistant, Department of Civil and Environmental Engineering, University of Pittsburgh, Pittsburgh, PA |
| 2002 – 2003 | Engineering Intern, Pennsylvania Department of Transportation, Bridgeville, PA |

Summary Evaluation:

Teaching: Professor Jeffers' teaching evaluations and comments from students at all levels indicate that she is a superb mentor and excellent teacher. Her average Q1 and Q2 scores are 4.43 and 4.62, placing her among the best in the department. For her outstanding teaching, she was awarded the American Society of Civil Engineering's ExCEED New Faculty Excellence in Teaching Award in 2014. As an advisor, Professor Jeffers' commitment to her students, her drive to instill professional integrity and her sincere interest in their professional development is also noteworthy. Particularly noteworthy has been her active recruitment of underrepresented minority students for the NSF-funded Michigan Louis Stokes Alliance for Minority Participation (MI-LSAMP) grant and her participation in the Summer Undergraduate Research Experience (SURE) program. Professor Jeffers is also a strong proponent for the inclusion of global education in her students' experience, having initiated a local student chapter of the Bridges to Prosperity national service organization. She has graduated one Ph.D. student. Another is expected to graduate this year, with four more in progress.

Research: Professor Jeffers has made significant research contributions with her development of numerical simulations that combine computational fire dynamics and the nonlinear response of structures. Exact modeling of this interface is crucial for obtaining accurate predictions of the response of structures to a realistic fire environment. Professor Jeffers has been praised for initiating this work and has already established herself as an international leader in this area. She has garnered over \$1.1M from NSF and the Office of Naval Research to support her research, and she publishes

her results in the prominent journals in her field. Professor Jeffers' work was recently recognized with the Harry C. Bigglestone Award for Excellence in Communication of Fire Protection Concepts for the most outstanding paper in 2013 in the *Journal of Fire Protection*. She was also the recipient of an NSF CAREER award in 2013 to support her ground-breaking work.

Recent and Significant Publications:

- Guo, Q. and Jeffers, A.E., (2014), "Finite Element Reliability Analysis of Structures Subjected to Fire," *Journal of Structural Engineering*, DOI: 10.1061/(ASCE)ST.1943-541X.0001082.
- Jeffers, A.E. and Beata, P.A., (2014), "Generalized Shell Heat Transfer Element for Modeling the Thermal Response of Non-Uniformly Heated Structures," *Finite Elements in Analysis and Design*, 83, 58-67.
- Yu, X. and Jeffers, A.E., (2013), "A Comparison of Subcycling Algorithms for Bridging Disparities in Temporal Scale Between the Fire and Solid Domains," *Fire Safety Journal*, 59, 55-61.
- Guo, Q., Shi, K., Jia, Z., and Jeffers, A.E., (2013), "Probabilistic Evaluation of Structural Fire Resistance," Special Issue: World Trade Center, *Fire Technology*, 49, 793-811.
- Jeffers, A.E., (2013), "Heat Transfer Element for Modeling the Thermal Response of Non-Uniformly Heated Plates," *Finite Elements in Analysis and Design*, 63, 62-68.

Service: Professor Jeffers has earned national prominence for her dedicated service on technical committees on both the structural response side of her research (American Society of Civil Engineers Fire Protection Committee), and the fire modeling side (Society of Fire Protection Engineers Standards Making Committee, SFPE). In recognition of her service to the SFPE, she received the 2014 Rolf H. Jensen Award for "extraordinary and unusual service to an SFPE committee." Because of her national and emerging international reputation as well as technical breadth, she was recently appointed an associate editor for the *Fire Safety Journal*, the top journal in the field of fire safety engineering. Locally, Professor Jeffers has served on numerous committees and worked to increase diversity and improve the climate of the College of Engineering through her leadership as the CEE Chair for Tech Day, by being a mentor for the Network for Women in Civil and Environmental Engineering, and by developing design projects for Women in Science and Engineering summer camps. Her interest in the broad development of a student's talent has been demonstrated through her outreach activities that include the founding and service as a faculty advisor for the University of Michigan Student Chapter of Bridges to Prosperity.

External Reviewers:

Reviewer A: "Dr. Jeffers' research is primarily in the area of structural-fire engineering. Among researchers [of her cohort] working in this area, both in the U.S. and internationally, I consider Dr. Jeffers to be at the top of this group."

Reviewer B: "Dr. Jeffers' scholarship on structural performance in fire has made important contributions to the profession...Dr. Jeffers is one of the pioneers of this field, laying down the fundamental concepts that will pave the way for developing reliability-based approaches for fire design."

Reviewer C: "She received high recognition, 'Harry C. Bigglestone Award,' for her recent paper published in the *Journal of Fire Technology (JFT)*. This award is given annually to the most outstanding paper in JFT and her contribution was cited as "pioneering" and having "the potential to change the way structural fire design is done."

Reviewer D: "Dr. Jeffers is emerging as one of the leading scholars [of her cohort] in studying

effects of fire on structures...The major contributions are two-folds [sic]: (1) finite element models to understand the effects of fire on structure, and (2) reliability analysis of structures due to fire and thermal loads.”

Reviewer E: “The high quality of the Dr. Jeffers research is evidenced by the high caliber of journals in which her papers are published, her receipt of the Harry C. Bigglestone award..., the number of invitations she has received to present her work, and the number of invitations she has received to participate in NSF- and NIST-sponsored workshops addressing structural engineering for fire.”

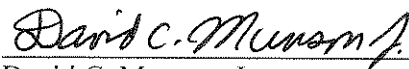
Reviewer F: “I think Ann’s strength as a professor of engineering is a terrific work ethic, great communication skills, and rigorous scholarship. I highly recommend her promotion.”

Reviewer G: “Prof. Jeffers is quickly becoming an international reference on the topic of computational fire and structures. She is on a stellar path to success. Her work is now routinely discussed in conferences (especially in Europe and Asia) and each of her new journal papers have become a must-read for PhD student [sic] on the area.”

Reviewer H: “Overall, Dr. Jeffers is considered among the most promising scientists within the fire and structural community. There is no doubt that her reputation, productivity, achievements and recognition will continue to increase leading to an exciting career that will greatly influence the science and practice of structural fire safety engineering.”

Reviewer I: “Over the past five years, Dr. Jeffers has established herself as the preeminent researcher in the field of structural fire engineering particularly related to topics of computational methods and reliability analysis...I highly recommend Dr. Jeffers for promotion and tenure at the U. of Michigan.”

Summary of Recommendation: Professor Jeffers is a visible and highly-respected researcher. Her pioneering research efforts at the interface between modeling fire characteristics and the nonlinear response of structures in a fire environment have been lauded by her senior peers who consider her to be the leading national and international scholar, of her cohort, in her field. She is an excellent teacher and mentor of undergraduate and graduate students. She has made significant service contributions to professional societies, as well as within the college and local community. It is with the support of the College of Engineering Executive Committee that I recommend Ann E. Jeffers for promotion to associate professor of civil and environmental engineering, with tenure, Department of Civil and Environmental Engineering, College of Engineering.



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

May 2015