

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Climate and Space Sciences and Engineering

Allison L. Steiner, associate professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering, and associate professor of Earth and environmental sciences, without tenure, Department of Earth and Environmental Sciences, College of Literature, Science, and the Arts, is recommended for promotion to professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering, and professor of Earth and environmental sciences, without tenure, Department of Earth and Environmental Sciences, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D. 2003 Georgia Institute of Technology, Atmospheric Science, Atlanta, GA
B.S. 1994 Johns Hopkins University, Chemical Engineering, Baltimore, MD

Professional Record:

2012 – present Associate Professor (without tenure), Department of Climate & Space Sciences and Engineering, University of Michigan
2012 – present Associate Professor (with tenure), Earth and Environmental Sciences, University of Michigan
2006 – 2012 Assistant Professor Department of Climate & Space Sciences and Engineering, University of Michigan
2003 – 2003 Visiting Scientist, Atmospheric Chemistry Division, National Center for Atmospheric Research, Boulder, CO
2003 – 2006 Post-Doctoral Research Fellow, Department of Environmental Science, Policy and Management, University of California, Berkeley, CA

Summary of Evaluation:

Teaching: Professor Steiner's teaching accomplishments demonstrate solid performance with traditional classroom courses at the undergraduate service level, the upper division undergraduate level within the major, and at the graduate level in courses related to her research activities. Notably, she has undertaken significant teaching responsibilities of a non-traditional nature, serving as mentor and undergraduate research advisor to numerous undergraduates working in the fields of climate science and related applications. These activities have thus far resulted in three peer-reviewed journal articles with undergraduate students as co-authors (two published, one currently in review). She has also served as a faculty advisor to a CoE Multidisciplinary Design Program (MDP) project involving 25 students at the undergraduate and masters level. The MDP student team presented their results at a major professional society conference of the American Meteorological Society. She has graduated five Ph.D. students as the chair or co-chair with another three in progress.

Research: Professor Steiner works at the interdisciplinary boundaries between air quality, atmospheric chemistry, and biology as they relate (and are inter-related) to the Earth's climate system. Her research addresses problems that are currently pivotal for the climate science community, as the causes, effects and implications of the changing climate have never been more important. Her most influential publications report contributions to coupled land/atmosphere effects on global warming, global warming effects on air quality related to tropospheric ozone, and the role of biology, namely pollen, on the global water cycle. These studies also demonstrate Professor Steiner's propensity to work across boundaries of the climate

sciences that are traditionally distinct and (unfortunately) rather isolated. She has established herself as a major interdisciplinary climate scientist, both nationally and internationally. Professor Steiner's strong and consistent level of support from NSF, NASA, NOAA, and others is noteworthy. Her share of past support while at UM totals \$1.66M out of \$8.25M in total grant and contract value, while her share of current sponsored research totals \$1.75M out of \$4.83M. These numbers suggest a strong funding base and significant collaborative interactions with other research groups.

Recent and Significant Publications:

- Li, Y., M.C. Barth, G. Chen, E.G. Patton, S.-W. Kim, A. Wisthaler, T. Mikoviny, A. Fried, R. Clark, A.L. Steiner, "Large-eddy simulation of biogenic VOC chemistry during the DISCOVER-AQ 2011 campaign," *Journal of Geophysical Research-Atmospheres*, 07/16/2016; 121(13): 8083-8105, doi:10.1002/2016JD024942.
- Kawecki, S., G.M. Henebry, A.L. Steiner, "Effects of urban plume aerosols on a mesoscale convective system," *Journal of the Atmospheric Sciences*, 2016; 73: 4641-4660, doi: 10.1175/JAS-D-16-0084.1.
- Bryan, A.M., S.J. Cheng, K. Ashworth, A.B. Guenther, B.S. Hardiman, C.S. Vogel, G. Bohrer, A.L. Steiner, "Forest-atmosphere BVOC exchange in diverse and structurally complex canopies: 1D modeling of a mid-successional forest in northern Michigan," *Atmospheric Environment*, 11/01/2015; 120: 217-226, doi: 10.1016/j.atmosenv.2015.08.094.
- Steiner, A.L., S.D. Brooks, C. Deng, D.C.O. Thornton, M. Pendleton, V. Bryant, "Pollen as atmospheric cloud condensation nuclei," *Geophysical Research Letters*. 05/16/2015; 42(9): 3596-3602, Citation Count: 11, doi: 10.1002/2015GL064060.
- Bryan, A.M., A.L. Steiner, D.J. Posselt, "Regional modeling of surface-atmosphere interactions and their impacts on Great Lakes hydroclimate." *Journal of Geophysical Research-Atmospheres*, 02/16/2015; 120(3): 1044-1064, Citation Count: 4, doi: 10.1002/2014JD022316.

Service: Professor Steiner's contributions to service have been exemplary both within the UM and beyond. She has served on several departmental committees with significant time commitments (the CLaSP Faculty Search Committee and the CLaSP Executive Committee), is the current co-chair of the CoE NextProf Workshop (a program to help inform and educate under-represented doctoral students on skills and opportunities required to be successful in academic positions), and, at the university level, has served on numerous program review and fellowship selection committees. Beyond UM, among her many service contributions, she has served on the editorial board of the journal *JGR-Atmospheres* and sit on the Board of Atmospheric Sciences and Climate of the National Academy of Sciences. Her leadership of the Earth Science's Women's Network is another significant contribution to the professional community.

External Reviewers:

Reviewer A: "I would like also to stress the ability of Allison to communicate her research to broad audiences and to her students. I like very much her philosophy that leads her 'to teach climate and atmospheric science as a way to understand the world around us, and to improve our environment.' In other words, Allison is combining scientific and engineering approaches to help the world become more sustainable."

Reviewer B: "The work of Professor Steiner that first drew my attention was biosphere-atmosphere interactions ... Professor Steiner showed in a 2010 PNAS paper that this linear relationship [of tropospheric ozone level increase] only holds true up to temperatures of ~39° C. The detailed understanding provided by this work is really critical for developing effective control strategies for tropospheric ozone, without unrecognized unintended consequences."

Reviewer C: "What is truly impressive about Professor Steiner's research is that she recognizes the new frontiers and attacks them innovatively and rigorously ... I am particularly excited by the new directions in her research, especially her work on pollen as potential cloud condensation nuclei ... This is a new idea. As is typical of Professor Steiner, she carries out beautiful examination with microscopy (with EDS) and analysis of proteins and carbohydrates in the pollen samples. This opens up a totally new avenue of inquiry in cloud microphysics."

Reviewer D: "I can count Allison Steiner among the leading international experts in this research field, and among the very few with absolute forefront expertise in the area of land impacts on atmospheric chemistry. This is demonstrated by several prestigious awards that she received in recent years..."

Reviewer E: "That Allison Steiner is recognized as a world leader in the field of atmospheric chemistry and, more broadly, atmospheric science is evidenced in ... her appointment to the National Research Council Member Board on Atmospheric Sciences and Climate, and her leadership on the recent NRC study: 'The Future of Atmospheric Chemistry Research report, 2015 – 2016.' This is a very influential study that will substantially inform national investments in our field over the next decade."

Summary of Recommendation: Professor Steiner's teaching accomplishments demonstrate solid performance. She has established herself as a major interdisciplinary climate scientist, both nationally and internationally. Her contributions to service have been exemplary both within the UM and beyond. It is with the support of the College of Engineering Executive Committee that I recommend Allison L. Steiner for promotion to professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering, and professor of Earth and environmental sciences, without tenure, Department of Earth and Environmental Sciences, College of Literature, Science, and the Arts.



Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering



Andrew D. Martin, Dean
Professor of Political Science and Statistics
College of Literature, Science, and the Arts

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