

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

Xianglei Huang, associate professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences, College of Engineering, 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.

Academic Degrees:

Ph.D. 2004 California Institute of Technology, Pasadena, CA  
M.S. 2000 California Institute of Technology, Pasadena, CA  
B.S. 1997 University of Science and Technology of China, Hefei, China

Professional Record:

2012-Present Associate Professor, with tenure, Department of Climate and Space Sciences and Engineering, University of Michigan  
2006-2012 Assistant Professor, Department of Climate and Space Sciences and Engineering, University of Michigan  
2006-2006 Associate Research Scholar, Program in Atmospheric and Oceanic Sciences, Princeton, Princeton University, New Jersey  
2004-2006 AOS Post-doctoral Research Associate, Program in Atmospheric and Oceanic Sciences, Princeton University, Princeton, New Jersey

Summary of Evaluation

Teaching: Professor Huang's classroom teaching has centered around a pair of required courses in radiative transfer, one undergraduate and one graduate. He has also developed a graduate-level course in Climate Data Analysis that covers advanced computational methods. Professor Huang's ability to make what are often considered dry and theoretical topics more accessible to the students is captured in student letters. The letters also speak to his dedication as a teacher and to his willingness to devote the time necessary to help his students learn. Professor Huang has graduated five Ph.D. students (one as co-chair) and currently advises another three.

Research: Professor Huang's primary area of research has focused on the use of spectrally resolved observations across the infrared spectrum in the Earth's atmosphere and their use in evaluating climate models. He has used the observed spectrally resolved infrared radiance in conjunction with climate models to evaluate biases in the model representation of water vapor. Of particular significance was his development of a global data base for surface spectral emissivity and demonstration of the importance of spectral emissivity as well as the scattering of infrared radiation by ice clouds for determining outgoing longwave radiation in polar regions. The importance of these studies was recognized by his selection as a co-I for implementation on two high-profile satellite missions. One of these is for ESA, signifying his international standing. Professor Huang has published over 60 articles in peer-reviewed journals (over 40 in current rank). Of these articles, nearly 20 were published as first author, another many with his

graduate students and post-doctoral candidates as first author. He has established solid funding for his group, positioning him for sustained leadership in his research area.

#### Recent and Significant Publications:

- Huang, X. L., X. H. Chen, M. G. Flanner, P. Yang, D. Feldman, C. Kuo, “Improved representation of surface spectral emissivity in a global climate model and its impact on simulated climate,” *Journal of Climate*, 2018; 31(9): 3711-3727.
- Huang, X.L., X.H. Chen, D.K. Zhou, X. Liu, “An observationally based global band-by-band surface emissivity dataset for climate and weather simulations,” *J. Atmos. Sci.*, 2016; 73: 3541-3555.
- Chen, X. H, X. L. Huang, “Sensitivity of modeled far-IR radiation budgets in polar continents to treatments of snow surface and ice cloud radiative properties,” *Geophysical Research Letters*, 2014; 41(18): 6530-6537.
- Huang, X.L., N.G. Loeb, W.Z. Yang, “Spectrally resolved fluxes derived from collocated AIRS and CERES measurements and their application in model evaluation, Part II: cloudy sky and band-by-band cloud radiative forcing over the tropical oceans,” *JGR-Atmospheres*, 2010; 115: D21101.
- Huang, X.L., Y. L. Yung, “Spatial and spectral variability of the outgoing thermal IR spectra from AIRS: A case study of July 2003,” *Journal of Geophysical Research – Atmospheres*, 2005; 110(6): D12102.

Service: Professor Huang’s service activities are extensive, dating back to the beginning of his appointment as an assistant professor in 2006. He served on his department’s executive committee from 2009 to 2011 and ran the departmental seminar (2008 to 2009). Since his tenure in 2012, he has made significant contributions at the department level through his service as the chair of two faculty search committees, one in 2012 to 2013, and one in 2016 to 2017. Because of his stature and standing in his scientific community, Professor Huang frequently serves on advisory committees and proposal review panels for NASA, DoE, NSF, and internationally for funding agencies in Italy, Great Britain, Kuwait, and New Zealand.

#### External Reviewers:

Reviewer A: “His peer reviewed publications are of high quality and he has published more than 60 peer reviewed papers. He also has a solid record of securing funding from various agencies. He also has a proven track record of service at multiple levels from within the University and community to national levels.”

Reviewer B: “NASA program managers seek out top scientists in the field for these [review] panels, and the fact that they keep coming back to Dr. Huang is testimony that they hold him in very high regard.”

Reviewer C: “In summary, I think Xianglei is highly qualified individual that fully deserves the promotion to full professor at this point in his career...He would almost certainly be promoted at [my institution]. Individuals like Xianglei are hard to find. I would do everything I could to keep him happy.”

Reviewer D: “Professor Huang has done groundbreaking work in the utilization of spectrally resolved observations in a number of areas, including remote sensing, radiation budget, climate and weather model evaluation and climate feedback analysis.”

Reviewer E: “I believe that Xianglei is at the very top of his peers in infrared radiation – climate studies.”

Summary of Recommendation: Professor Huang has clearly demonstrated the characteristics of a truly outstanding researcher, scholar, teacher, and a valuable member of the University of Michigan academic community. It is with the support of the College of Engineering Executive Committee that I recommend Xianglei Huang for promotion to professor of climate and space sciences, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering.



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Alec Gallimore, PhD  
Robert J. Vlasic Dean of Engineering  
College of Engineering

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