

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

Christiane Jablonowski, associate professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, 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:

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| Ph.D. | 2004 | University of Michigan, Atmospheric and Space Sciences and Scientific Computing, Ann Arbor, MI |
| M.S. | 1998 | University of Bonn (Diplom), Meteorology, Bonn, Germany |
| B.S. | 1994 | RWTH Aachen University (Vordiplom), Physics, Aachen, Germany |

Professional Record:

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| 2013 – present | Associate Professor (with tenure), Department of Climate and Space Sciences and Engineering, University of Michigan |
| 2006 – 2012 | Assistant Professor, Department of Atmospheric Oceanic and Space Sciences, University of Michigan |
| 2006 | Research Fellow, Department of Atmospheric Oceanic and Space Sciences, University of Michigan |
| 2004 – 2006 | Post-doctoral Researcher, Advanced Study Program and Scientific Computing Division, National Center for Atmospheric Research, Boulder, CO |

Summary of Evaluation:

Teaching: Professor Jablonowski has demonstrated a dedication to teaching that includes both the classroom and departmental culture. Her classroom evaluations are solid, and more telling of her excellence are the letters from students and her colleagues. She has an active and effective role in DEI activities, especially gender equity. Professor Jablonowski has sustained excellence in teaching and advising at all levels. Her students note her ability to adapt her teaching methods. She promotes her students through first authorship, and they have an impressive range of awards. She has graduated seven Ph.D. students as chair or co-chair and is the chair of another Ph.D. student in progress. She has also been a member of several other Ph.D. committees. She is actively involved in advising M.S. and undergraduate students and mentoring post-doctoral scholars.

Research: In the climate sciences, Professor Jablonowski has developed advanced modeling tools to support scale interactions in global circulation models (GCM). These techniques, most notably the dynamically moving Adaptive Mesh Refinement (AMR) and the statistically nested variable-resolution meshes have been recognized by DoE award and the Presidential Early Career Award for Scientists and Engineers. She has developed idealized model configurations and test setups to NCAR's Community Earth System Model (CSEM) software framework. Her research results initially published in scientific journals, such as the baroclinic wave test case and the moist variant of the Held-Suarez test, have been transitioned to operations at the NOAA and

NCAR model suites benefitting both the weather and climate research and operational services, benefiting the entire climate community. Professor Jablonowski's research papers, presentations, and proposals show the growth of her research interests, with a recent move into data science. The rigor of the complex simulation experiments that she and her students have designed for model verification are repeatedly noted. She prioritizes student's publications with students receiving lead authorship. Presently, Professor Jablonowski has approximately \$1M in grants from NOAA. Her productivity has remained high throughout the time since her previous promotion.

Recent and Significant Publications:

- C. Jablonowski and D. L. Williamson, "A Baroclinic Instability Test Case for Atmospheric Model Dynamical Cores," *Quarterly Journal of the Royal Meteorological Society*, 2006; 132: 621C, 2943-2975.
- C. Jablonowski and D. L. Williamson, "The Pros and Cons of Diffusion, Filters and Fixers in Atmospheric General Circulation Models," Numerical Techniques for Global Atmospheric Models, Lauritzen, P. H., C. Jablonowski, M. A. Taylor and R. D. Nair: Lecture Notes in Computational Science and Engineering, Springer, Vol. 80: 381-493; 2011.
- K. A. Reed and C. Jablonowski, "Idealized Tropical Cyclone Simulations of Intermediate Complexity: A Test Case for AGCMs," *Journal of Advances in Modeling Earth Systems*, 2012; 4: M04001.
- J. Kent, C. Jablonowski, J. Thuburn and N. Wood, "An Energy Conserving Restoration Scheme for the Shallow Water Equations," *Quarterly Journal of the Royal Meteorological Society*, 2016; 142: 1100-1110.
- J. O. Ferguson, C. Jablonowski and H. Johansen, "Assessing Adaptive Mesh Refinement (AMR) in a Forced Shallow-Water Model with Moisture," *Mon. Wea. Rev.*, 2019; 147: 3673-3692.

Service: Professor Jablonowski's service has two primary dimensions; service to the climate modeling research community and service to the University of Michigan. Her external service is extraordinary and serves to advance the scientific excellence of the community through rigorous numerical verification. This is characterized by her leadership in the Dynamical Core Model Intercomparison Project (DCMIP). She participates in several other community projects either as organizer or advisor. Internally, her work with the Michigan Institute of Computational Discovery and Engineering is notable. In her department, she led an important strategic planning activity, which focused on changing departmental culture to be more collaborative and inclusive. Recently, she has been engaged in the CLaSP faculty DEI discussion series.

External Reviewers:

Reviewer A: "Fifteen years later, I realize how prescient Dr. Jablonowski's work was now that adaptive methods are appearing in many new models. ... Subsequent papers continued the theme, ... and now 'Jablonowski' is the name associated with the global standard of test suites used by everyone."

Reviewer B: "Without her focused, competent, results-oriented, yet open and unbigoted way of interaction, which enables her to lead such efforts and create a productive environment, the

DCMIP initiative would never have happened.... I found the number of awards earned by her students and mentees most impressive, when revisiting her CV.”

Reviewer C: “One way that she has led the field is by providing the most widely used evaluation tool for the ‘dry dynamical core’ of global atmospheric models”

Reviewer D: “I can unequivocally state Christiane’s career has been marked by significant accomplishments in the design of atmospheric model dynamical cores, adaptive mesh and variable-resolution modeling techniques, and the use of Machine Learning (ML) concepts in the atmospheric sciences. I rank Christiane to be in the top 5% of those working in these areas – she is stellar.”

Reviewer E: “In addition to being a visionary in advocating models that could run well on the new (then) computer architectures, Professor Jablonowski was, even in the early days of her career, a voice of the uncomfortable dialog between climate scientists and computational scientists that if we weren’t careful with these numerical methods, then we wouldn’t be using the scientific method, which is absolutely crucial if we are to use these models to make policy decisions about the environment.”

Summary of Recommendation: Professor Jablonowski is an internationally recognized leader in numerical analysis and computational fluid dynamics. She has mentored a set of students who are finding success at peer academic institutions; she works to secure that students receive recognition. It is with the support of the College of Engineering Executive Committee that I recommend Christiane Jablonowski for promotion to professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering.



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

May 2021