

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

Justin C. Kasper, associate professor of climate and space sciences and engineering, without 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:

Ph.D. 2003 Massachusetts Institute of Technology, Physics, Cambridge, MA  
A.B. 1999 University of Chicago, Physics, Chicago, IL

Professional Record:

2013 – present Associate Professor (without tenure), Department of Climate and Space Sciences and Engineering, University of Michigan  
2007 – 2013 Astrophysicist, High Energy Astrophysics Division, Smithsonian Astrophysical Observatory, Cambridge, MA  
2005 – 2009 Visiting Scholar, Center for Space Physics, Boston University, Boston, MA  
2004 – 2005 Research Scientist, Kavli Institute for Astrophysics and Space Research, MIT, Cambridge, MA  
2002– 2004 Post-doctoral Researcher, Kavli Institute for Astrophysics and Space Research, MIT, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Kasper is a talented and energetic classroom instructor. His classroom experience includes a variety of small courses, many with hands-on projects. He also taught one large (174 students) course, Space 101: Rocket Science, for which he received excellent ratings. Letters from students note his enthusiasm for the material, his engaging style, his openness to flipping the classroom into discussion sessions, and his willingness to open his experimental research laboratory for class projects. He is a dedicated advisor and mentor of student research projects at both the undergraduate and graduate level. Through engaging students in hardware and data analysis he educates not only scientists but also future leaders in the field. He has graduated two Ph.D. students and is advising another five in progress, with two due to graduate this year.

Research: In the field of solar wind and heliospheric research, Professor Kasper is without peer as a successful experimentalist in his cohort. His solar wind instrument (SWEAP) on the NASA Parker Solar Probe mission, for which he was chosen over more established research groups, is a technological triumph for its capability to perform in the extreme heat that will be experienced by a spacecraft that will fly to within 10 solar radii of the Sun. He is one of the leaders of the plasma instrument (PIMS) for the Europa Mission and Instrument Lead (Faraday Cup) for the

DISCOVER mission (managed by NOAA). Professor Kasper's share of funding on sponsored research is \$3.4M, and his track record with major instruments position him favorably for selection to develop instruments for NASA missions for many years to come. This work has also been productive of scholarship. Professor Kasper has over 140 publications, and a Google h-index of 46.

#### Recent and Significant Publications:

- J. C. Kasper, K. G. Klein, T. Weber, M. Maksimovic, A. Zaslavsky, S. D. Bale, B. A. Maruca, M. L. Stevens, A. W. Case, "A zone of preferential ion heating extends tens of solar radii from the Sun," *Astrophys. J.*, 849(2), 126, 2017.
- J. C. Kasper, B. A. Maruca, M. L. Stevens, A. Zaslavsky, "Sensitive test for ion-cyclotron resonant heating in the solar wind," *Phys. Rev. Lett.*, 110, 091102, 2013.
- S. D. Bale, J. C. Kasper, G. G. Howes, E. Quataert, C. Salem, D. Sundkvist, "Magnetic fluctuation power near proton temperature anisotropy instability thresholds in the solar wind," *Phys. Rev. Lett.*, 103, 211101, 2009.
- J. C. Kasper, A. J. Lazarus, S. P. Gary, "Hot solar-wind helium: Direct evidence for local heating by Alfvén-cyclotron dissipation," *Phys. Rev. Lett.*, 101, 261103, 2008.
- P. Hellinger, P. Travnicek, J. C. Kasper, A. Lazarus, "Solar wind proton temperature anisotropy: Linear theory and WIND/SWE observations," *Geophys. Res. Lett.*, 33, L09101, 2006.

Service: Professor Kasper has an excellent record of service to the profession at fairly high levels. He has served on major advisory and policy committees, including the National Research Council (NRC) Assessment of the NSF's 2015 Geospace Portfolio, National Academies Intelligence Science and Technology Experts Group (ISTEG), NRC Committee on Solar and Space Physics (CSSP), NRC Decadal Survey on Solar and Space Physics, NASA Heliophysics Division Roadmap Committee and the NASA Solar and Heliospheric Management and Operations Working Group (MOWG). In his role as instrument lead on major NASA missions, he has formed highly diverse multi-institution teams. Internally, Professor Kasper has been an indispensable member in the formation of the MSpace Institute, which will provide collaborative opportunities to the UM and regional space sciences community.

#### External Reviewers:

Reviewer A: "His scientific work is uniformly of high quality and he has contributed significantly to our understanding of the solar wind and the interplanetary medium."

Reviewer B: "Justin is one of the instrumentalists [of his cohort] in space physics today and he will be one of the future leaders in Heliophysics. ... I cannot think of a case that is more deserving of promotion."

Reviewer C: "Justin is the best person I know in his [cohort] in experimental heliophysics. His combination of experimental contributions, understanding of the key science questions, and analysis of satellite data sets him apart from almost everyone in the field."

Reviewer D: “Justin is one of the rising stars in experimental space science who has already made important contributions to the field and has the potential to be a world leader in heliophysics.”

Reviewer E: “Justin will continue to lead proposals to NASA (and NSF) in instrumentation for Heliophysics and Space Physics and strengthen the excellence of experimental research at Michigan.”

Reviewer F: “I do not see a peer at this stage in Justin’s careers. Justin can only be compared to others much more senior and established e.g., the other PIs of instruments on PSP, and despite the gap in years, experience, length of CV, Justin stacks up well.”

Reviewer G: “Part of the reason for Prof. Justin [Kasper]’s success in space instrumentation is that he has an excellent grasp of the underlying plasma physics which enables him to identify important unsolved problems and focus on how to obtain and analyze the data that would solve them.”

Summary of Recommendation: Professor Kasper is a superstar researcher, very productive teacher and active member of the CoE faculty. He has made significant contributions to the field of heliospheric physics; he is an excellent teacher and mentor; and he is a leader who contributes both in external and internal service. It is with the support of the College of Engineering Executive Committee that I recommend Justin C. Kasper for promotion to professor of climate and space sciences and engineering, with tenure, Department of Climate and Space Sciences and Engineering, College of Engineering.



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

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