

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

Xianzhe Jia, associate professor of climate and space sciences and engineering, with tenure, Department of and Space Sciences and Engineering, College of Engineering, is recommended for promotion to professor of climate and space sciences and engineering, with tenure, College of Engineering.

Academic Degrees:

Ph.D.	2009	University of California, Geophysics and Space Physics, Los Angeles, CA
M.S.	2004	University of California, Geophysics and Space Physics, Los Angeles, CA
M.S.	2002	University of Science and Technology, Geophysics and Space Physics, Hefei, China
B.S.	1999	University of Science and Technology, Geophysics, Hefei, China

Professional Record:

2015 – present	Associate Professor with tenure, Department of Climate and Space Sciences and Engineering, University of Michigan
2010 – 2015	Assistant Research Scientist, Department of Climate and Space Sciences and Engineering, University of Michigan
2009 – 2010	Research Fellow, Atmospheric, Oceanic and Space Sciences, University of Michigan.

Summary of Evaluation:

Teaching: Professor Jia’s teaching record provides strong evidence of high quality, well-organized, rigorous teaching. He has offered a compassionate and accommodative environment both in the classroom and as a research mentor. He has worked constantly to improve his instructional methods and to create a diverse and inclusive learning environment. Student comments are overwhelmingly positive. Since joining the CLaSP faculty in 2015, he has had a clear impact upon the department’s undergraduate and graduate curricula. Professor Jia restructured and updated SPACE 477 and SPACE 574, which have led to increased enrollments in these courses and Q1 and Q2 scores from student evaluations above “4.” He is the chair or co-chair for seven Ph.D. committees and has been a member of another five committees. In addition, he has also advised undergraduate research projects and participated in the CLaSP Research Experience for Undergraduates program sponsored by the NSF.

Research: Professor Jia is a leader in magnetospheric physics and planetary science. This leadership has been particularly evident in his pioneering use of magnetosphere – moon and solar wind – planetary interactions to probe the interiors of the Galilean satellites and Mercury. The international science community recognizes his leadership and achievements in these and other important areas. The total number of scientific articles, the rate at which Professor Jia is publishing in highly rated journals, including *Science and Nature*, and the number of articles with graduate students as primary author, indicate that he has an extremely impactful research

program. The funding level he has achieved, supports a broad research program and steady pipeline of graduate students. This high level of funding also provides a measure of the great value attached to Professor Jia's research by research sponsors and the scientific community. He has authored or co-authored over 100 publications in refereed scientific journals, over 95 refereed conference summary abstracts, and several book chapters.

Recent and Significant Publications:

- X. Jia, J. Slavin, G. Poh, G. DiBraccio, G. Toth, Y. Chen, J. Raines, & T. Gombosi, "MESSENGER Observations and Global Simulations of Highly Compressed Magnetosphere Events at Mercury," *JGR Space Physics*, 10.1029/2018JA026166, 2019.
- X. Jia, M. Kivelson, K. Khurana, & W. Kurth, "Evidence of a plume on Europa from Galileo magnetic and plasma wave signatures," *Nature Astronomy*, 2, 459-464 2018.
- X. Jia, M. Kivelson, & T. Gombosi, "Driving Saturn's magnetospheric periodicities from the upper atmosphere/ionosphere," *Journal of Geophysical Research*, 117, A04215, 2012.
- X. Jia, M. Kivelson, K. Khurana, W. Kurth, "Evidence of a plume at Europa from Galileo magnetic and plasma wave signatures," *Nature Astronomy*. 05/2018; 2: 459-464; 2012.
- K. Khurana, X. Jia, M. Kivelson, F. Nimmo, G. Schubert, & C. Russell, "Evidence of a Global Magma Ocean in Io's Interior," *Science AAAS*, 332, 1186, 2011.

Service: Professor Jia's service contributions inside and outside the university are impressive. His service on the CLaSP Executive Committee, Strategic Planning, Research Quality, Graduate Qualifier and Faculty Awards committees constitutes a good portfolio of service for a professor. His professional service includes major leadership, scientific and outreach roles in the space plasma and planetary science communities including two major planetary science missions, Europa Clipper, and JUICE. Professor Jia's service commitments to popularizing space science discoveries for the public have had international impact.

External Reviewers:

Reviewer A: "Dr Jia is an outstanding research scientist with a sustained level of high-impact publications, national awards, and a wide range of funded activities.... Dr Jia is a talented individual, who is an exceptional research leader. Their work is influential and as a result Dr[.] Jia is consistently in demand by space missions and researchers across the international community. I would not hesitate in appointing Dr Jia as a Professor in my School, if I were to have such an opportunity!"

Reviewer B: "...Dr. Xianzhe Jia unequivocally meets the research criteria for promotion to Professor at UM. His research has been impactful and visible, his productivity is excellent, his funding record is astounding....CLASP is fortunate to have Xianzhe Jia in its ranks, and any department in the country would love to have him on their faculty."

Reviewer C: "There is little doubt that Dr. Xianzhe Jia has firmly established his reputation and, in fact, authority in the study of the magnetospheres of the outer planets...He has made a number of breakthroughs in numerical modeling and data analysis including the discoveries of the water plume of Europa and the magma ocean of Io. His exploration of the Saturn magnetospheric dynamics are well known and his global simulation of Mercury's magnetosphere can be considered classical."

Reviewer D: “Professor Jia’s specialty is the numerical simulation of planetary magnetospheres, ...Perhaps his most significant contribution was the development of a model showing that the puzzling variations in the rotation period of Saturn as measured by the modulation of its radio emissions were due to vortical motions in the planet’s ionosphere... This breadth of understanding of many different planetary environments has made him a leader in this field.”

Reviewer E: “I believe Dr. Xianzhe Jia to be an accomplished scientist who continues to play a central and productive role at the University of Michigan, and indeed is developing those roles and responsibilities... I would expect that Dr. Xianzhe Jia would be able to continue this commitment to excellence and provide invaluable scientific leadership at both institutional and community level well into the future.”

Summary of Recommendation: Professor Jia has a well-documented, sustained record of impactful research accomplishments in space plasma physics and planetary science. His leadership roles in NASA’s Europa Clipper and ESA’s Jupiter Icy Moon Explorer missions are evidence of his high scientific stature in the international space science community. He is successful in attaining funding and supporting doctoral students in his group. He has shown dedication to teaching with the development of new courses while receiving high student evaluation scores. It is with the support of the College of Engineering Executive Committee that I recommend Xianzhe Jia 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 2023