

PROMOTION RECOMMENDATION  
The University of Michigan  
College of Literature, Science, and the Arts

Emily Rauscher, assistant professor of astronomy, College of Literature, Science, and the Arts, is recommended for promotion to associate professor of astronomy, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2010	Columbia University, New York
B.A.	2005	University of California, Berkeley

Professional Record:

2015 – present	Assistant Professor, University of Michigan
2014 – 2015	President’s Post-doctoral Fellow, University of Michigan
2013 – 2014	Lyman Spitzer Jr. Post-doctoral Fellow, Princeton University
2012 – 2013	NASA Sagan Post-doctoral Fellow, Princeton University
2010 – 2012	NASA Sagan Post-doctoral Fellow, University of Arizona

Summary of Evaluation:

Teaching: Professor Rauscher has been an excellent contributor to teaching within the department, having taught at all educational course levels (distribution, undergraduate major, graduate). A major highlight is the development of a new course for undergraduate majors on exoplanets. Professor Rauscher embraced this effort by bringing active teaching techniques into the classroom while exposing the students to a wide range of important astrophysical concepts in this new emerging field. Further, Professor Rauscher has been a leader in research opportunities for undergraduates, work that has often led to publications in field-leading journals. This dedication to our students is notable.

Research: Professor Rauscher is a world-leading theorist in the area of gas-giant atmospheric modeling, who has made important contributions towards our understanding of the structure and physics within the atmospheres of exoplanetary systems. Her theoretical work has provided grounding information to interpret observations and sets new constraints on the effects of clouds, the presence of atmospheric winds, 3-dimensional structure, and the effects of a surface on the atmosphere in lower mass planets. Throughout, Professor Rauscher has positioned herself, and her group, to operate at the frontier of today’s astrophysical capabilities and problems. The attention to astrophysical detail, and demonstrated knowledge of cutting-edge techniques, puts Professor Rauscher in excellent position to take state-of-the-art theoretical models, combined with a wide range of future new observational capabilities, into exciting new areas of discovery. Professor Rauscher’s high quality, rigorous scholarship is well valued in the Department of Astronomy and serves as a linchpin of the department’s efforts in this exciting new astrophysical frontier.

Recent and Significant Publications:

May, E. M. & Rauscher, E. (2020). From Super-Earths to Mini-Neptunes: Implications of a Surface on Atmospheric Circulation. *Astrophysical Journal*, 893(2), 161-173.

Roman, M. & Rauscher, E. (2019). Modeled Temperature-Dependent Clouds with Radiative Feedback in Hot Jupiter Atmospheres. *Astrophysical Journal*, 872(1). //dx.doi.org/10.3847/1538-4357/aafdb5

Rauscher, E., Suri, V., & Cowan, N. B. (2018). A More Informative Map: Inverting Thermal Orbital Phase and Eclipse Lightcurves of Exoplanets. *Astronomical Journal*, 156(235). //doi.org/10.3847/1538-3881/aae57f

(2017). Models of Warm Jupiter Atmospheres: Observable Signatures of Obliquity. *Astrophysical Journal*, 846(69). //doi.org/10.3847/1538-4357/aa81c3

Service: Professor Rauscher has devoted strong effort towards leadership, governance, and service within the Department of Astronomy and extending into the College of Literature, Science, and the Arts. Professor Rauscher has served on some of the more time-consuming committees in the department including the graduate admissions committee, the preliminary examination committee, and the Diversity, Equity, and Inclusion Committee. Professor Rauscher has placed herself front and center in improving our recruitment efforts as a member of the standing search committee, as a member of the graduate admission committee, and as a continual attendee at the National Society of Black Physicists (NSBP) and Society for the Advancement of Chicano/Hispanics and Native Americans in Science (SACNAS) meetings. Professor Rauscher also aided the college and the university through service on a high-level committee to select the new LSA Dean.

External Reviewers:

Reviewer A: “Dr. Rauscher is an impressive [junior] professor who absolutely has a worldwide reputation in modeling the atmospheric circulation of ‘exoplanets’... She has been consistently innovative in her science and in working at the interface of theory and observations.”

Reviewer B: “...no other modeler today has been as successful as Emily in combining theoretical work on atmospheric modelling together with observational campaigns on hot exoplanets.”

Reviewer C: “She has continued to stay at the forefront of this field, pushing the community towards new ideas which she helps to originate ... Emily’s work covers a broad range within the field of exoplanets and has been deeply influential.”

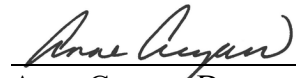
Reviewer D: “... Emily’s body of work is impressively rigorous and diverse, and has significantly impacted multiple aspects of the exoplanet field ... Emily is on a strong career trajectory...”

Reviewer E: “Rauscher is a world-leading exoplanet scientist, famous for her three-dimensional planet atmospheric simulations—with strong ties to observational work.”

Reviewer F: "... Dr. Rauscher is among the very best in her age group, on par with highly successful exoplanet atmosphere theorists ... and observers ..."

Summary of Recommendation:

Professor Rauscher is a world-leading expert in theoretical models of planetary atmospheric dynamics and structure. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Assistant Professor Emily Rauscher be promoted to the rank of associate professor of astronomy, with tenure, College of Literature, Science, and the Arts.



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Anne Curzan, Dean

Geneva Smitherman Collegiate Professor of  
English Language and Literature, Linguistics,  
and Education

Arthur F. Thurnau Professor

College of Literature, Science, and the Arts

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