Emily Rauscher (she/her/hers)

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Research Interests

Characterizing exoplanet atmospheres: using three-dimensional models of their atmospheric circulation, investigating how the atmosphere relates to the planet as a whole, and identifying observational methods that can constrain the planet's physical state

Education

Ph.D. in Astronomy **2010**

Columbia University, New York, NY

B.A. in Astrophysics and Physics (with High Honors) **2005**

University of California, Berkeley, CA

Employment

University of Michigan, Astronomy Department **2014 – present**

Associate Professor: Sept. 2021 – present
Assistant Professor: Sept. 2015 – Aug. 2021
[Maternity leave / modified duties: Fall 2015 – Winter 2016]
President's Postdoctoral Fellow: Sep. 2014 – Aug. 2015

Princeton University, Department of Astrophysical Sciences **2012 – 2014**

Lyman P. Spitzer Jr. Postdoctoral Fellow: Sep. 2013 – Aug. 2014
NASA Sagan Postdoctoral Fellow: Sep. 2012 – Aug. 2013

University of Arizona, Lunar & Planetary Laboratory **2010 – 2012**

NASA Sagan Postdoctoral Fellow

Awards and Fellowships

- Simons Fellow in Theoretical Physics, from the Simons Foundation 2022
- University of Michigan Class of 1923 Memorial Teaching Award 2021
- Scialog Fellow (from the Research Corporation and Heising-Simons Foundation, with the Kavli Foundation) 2019
- Cottrell Scholar Award from the Research Corporation for Science Advancement 2019
- Recent Alumni Award from Columbia University Graduate School of Arts and Sciences 2016
- President's Postdoctoral Fellow, University of Michigan 2014
- Lyman P. Spitzer Jr. Postdoctoral Fellow, Department of Astrophysical Sciences, Princeton University 2013
- NASA Sagan Postdoctoral Fellow 2010
- Kavli Institute for Theoretical Physics Graduate Fellow 2010
- NASA Graduate Student Researchers Program Fellow 2008

Mentoring

Current research group members:

- Undergraduate students: Fahin Rahman *(since 2020)*, Mireya Arora *(since 2021)*, Lucas Brefka *(since 2021)*, Grace Ochs *(since 2021)*, Derek Still *(since 2021)*, Lilia Cinque *(since 2022)*
- Ph.D. students: Hayley Beltz *(since 2018)*, Isaac Malsky *(since 2019)*
- Postdoctoral researchers: Arthur Adams *(since 2019)*, Ryan Challener *(since 2020)*, Kaitlin Rasmussen *(since 2020)*

Previous research group members:

- Undergraduates (16): Marah Brinjikji, Victoria DiTomasso, Zachary Felker, Rain Fleischer, Erin Flowers, Abigail Guilliat, Mariam Haidar, Caleb Harada, Christopher Kulwik, James Lisowski, Deryl Long, Kelly Meyer, Oderah (Justin) Otor, Teanna (Ruby) Sims, Kimberly Sinclair, Veenu Suri
- Post-baccalaureate researcher: Lilian Larson
- Ph.D. student: Erin May
- Postdoctoral researcher: Michael Roman

Ph.D. Thesis Committees:

- Juliette Becker (Astronomy 2019), Sarah Brehm (Earth 2021), Tyler Gardner (Astronomy), Stephanie Hamilton (Physics 2019), Camilla Harris (Climate & Space), Larissa Markwardt (Astronomy), Agnit Mukhopadhyay (Climate & Space), Kali Roeten (Climate & Space), Tom Rice (Astronomy 2019), Kamber Schwarz (Astronomy 2018)

Other mentoring/training activities:

- Rackham Mentoring Others Results in Excellence (MORE) Mentoring Workshops; U. Michigan 2016, 2019, 2019
  attended once with each graduate student in my group (May, Beltz, and Malsky)
- Princeton Astrophysics Undergraduate Summer Research Program; Princeton U. 2013, 2014
  as a co-organizer with other postdocs, we organized funding (partially through NSF REU Supplements), reviewed applications and accepted students into the program, matched students with advisors, held colloquia and research skills seminars twice a week, and ran a departmental event for the students' final presentations

Funded Awards, Grants, and Space Telescope Time

NASA Exoplanet Research Program **01/07/2022 – 11/30/2024**

Consistency is Key: A Uniform Reanalysis of Spitzer Phase Curves
PI: E. May
Co-Is:, J. Bean, E. Kempton, M. Mansfield, **E. Rauscher**, M. Roman, K. Stevenson
$205,944 to Rauscher

Heising-Simons Foundation Grant **01/01/2020 – 08/31/2023**

High Resolution Spectroscopy and Multi-Dimensional Atmospheric Characterization of Hot Jupiters
PI: **E. Rauscher**
PI of collaborative grant to U. Maryland: E. M.-R. Kempton
$762,128 total funding; $687,128 to Rauscher

Research Corporation for Science Advancement Cottrell Scholar Award **07/01/2019 – 06/30/2022**

Exo-Cartography: Resolving Three-Dimensional Images of Extrasolar Worlds
PI: **E. Rauscher**
$100,000 total funding

NASA Astrophysics Theory Program **02/14/2017 – 02/13/2020**

Beyond Hot Jupiters: Predicting Observable Signatures of Atmospheric Regime Transitions
PI: **E. Rauscher**
Co-I: E. M.-R. Kempton
$518,222 total funding; $481,773 to Rauscher

Spitzer Space Telescope, Cycle 13 **02/27/2017 – 03/30/2018**

The Ultimate Spitzer Phase Curve Survey
PI: K. Stevenson
Co-Is: J. Bean, D. Deming, J.-M. Desert, Y. K. Feng, J. Fortney, T. Kataria, E. Kempton, N. Lewis, M. Line, C. Morley, **E. Rauscher**, A. Showman
660 hours; $205,000 total funding, $10,000 to Rauscher

Spitzer Space Telescope, Cycle 11 **02/26/2016 – 09/30/2017**

Rounding Up the Misfit: Full-Orbit Measurements of CoRoT-2b
PI: N. Cowan
Co-Is: D. Deming, I. Dobbs-Dixon, J. Fortney, H. Knutson, M. Line, **E. Rauscher**, J. Schwartz, M. Zhao
50 hours; $38,435 total funding, $38,435 to Rauscher

Recent Invited Talks at Conferences

- "Recent Progress and a Near-Future Vision for Exoplanet Atmospheric Dynamics" 12/2021
  in the "Atmospheric Dynamics and Astro/geo-physical Modeling Studies of Habitable Ocean Worlds, Moons, and Atmospheres Near and Far" (ADAM SHOWMAN) session at the American Geophysical Union Fall meeting; New Orleans, LA (and virtual)
- "Recent Progress and Remaining Challenges in the 3D Modeling of Hot Jupiters" 09/2021
  Keynote talk at the Europlanet Science Congress; virtual meeting
- "Clouds in 3-D models of exoplanets" 08/2021
  at CloudNineCon; originally intended for Heidelberg, Germany; virtual meeting
- "Constraining Atmospheric Dynamics and 3-D Structure of Rocky Planets: Thick and/or Hotter Atmospheres" 09/2019
  at Rocky Planets in the Era of JWST; NASA Goddard Space Flight Center, Greenbelt, MD
- "Hot Jupiters: Dynamics, chemistry, and clouds" 08/2019
  at ExoClimes V; Oxford, England
- "Modeling Exoplanetary Atmospheres in Nearby Systems" 01/2019
  at the NASA Exoplanet Exploration Program Analysis Group's Mini-Science Symposium; Seattle, WA
- "Current mysteries of exoplanet atmospheres" 07/2018
  at Unsolved Mysteries in Astrophysics and Cosmology; Budapest, Hungary
- University of Toronto Center for Planetary Sciences' Planet Day; Toronto, Ontario 05/2018

- "Measuring the Obliquities of Warm Jupiters" 07/2017
  at Enabling Transiting Exoplanet Observations with JWST workshop; Baltimore, MD
- "Dynamics on Slow vs. Fast Rotators and the Question of Tidal Locking" 08/2016
  at ExoClimes 2016 conference; Squamish, BC, Canada
- "20 Years of Exoplanets: From Surveys Towards Characterization" 11/2015
  Plenary talk at AAS Division of Planetary Sciences Meeting; National Harbor, MD

Recent Invited Colloquia and Seminars

- University of Pennsylvania Astronomy Seminar; Philadelphia, PA *(via Zoom)* 04/2021
- University of Exeter Astrophysics Seminar; Exeter, England *(via Zoom)* 03/2021
- Michigan State University Astronomy Seminar; East Lansing, MI *(via Zoom)* 03/2021
- University of Arizona Theoretical Astrophysics Program Colloquium; Tucson, AZ 04/2018
- University of Chicago Astronomy & Astrophysics Colloquium; Chicago, IL 04/2018
- McGill University Space Institute Seminar; Montreal, Canada 10/2017
- University of Colorado Boulder Astrophysical & Planetary Sciences Colloquium; Boulder, CO 10/2017
- Harvard-Smithsonian CfA Institute for Theory and Computation Colloquium; Cambridge, MA 09/2017
- University of California Los Angeles Astronomy Colloquium; Los Angeles, CA 03/2017
- NASA Jet Propulsion Laboratory Astrophysics Colloquium; Pasadena, CA 02/2017
- Albion College Physics Seminar; Albion, MI 02/2017
- Indiana University Department of Astronomy Colloquium; Bloomington, IN 10/2016
- Massachusetts Institute of Technology Kavli Institute Astrophysics Colloquium; Cambridge, MA 05/2016

Teaching Experience

Classes taught at U. Michigan:

- Astronomy 101 "The Solar System and the Search for Life Beyond Earth", an intro class (co-taught)
  Fall 2016, Fall 2020, Fall 2021
- Astronomy 401 "Exoplanets", an upper-division astronomy elective
  Winter 2017 (and created as a new class), Winter 2018, Winter 2019, Winter 2020, Winter 2021, Winter 2022
- Astronomy 530 "Stellar Atmospheres and Star/Planet Formation", a graduate-level core class
  Fall 2019

Classes taught elsewhere:

- Preparatory math class; East Jersey State Prison in Rahway, NJ 2013-2014
  As a volunteer with Princeton's Prison Teaching Initiative, in the Fall I was part of a team teaching a preparatory math class, and in the Spring I led our first effort to have the advanced (calculus-level) students at this prison teach the preparatory class, under our supervision and mentorship.
- Head Teaching Assistant; Columbia University 2008-2009
  supervisory responsibilities over all of the Teaching Assistants for the non-major astronomy lab classes
- Teaching Assistant; Columbia University 2006-2008
  independent instructor for non-major astronomy lab classes
- Teaching Assistant; University of California, Berkeley 2004
  discussion sections and grading for an introductory astronomy class, Spring and Fall

Continuing training and education:

- "CUREnet Institute"; Tucson, AZ 04/2019
  a workshop on Course-Based Undergraduate Research Experience (CURE)
- "Creating Accessible Learning Environments"; U. Michigan 10/2017
  a Center for Research on Learning and Teaching workshop
- Teaching Academy; U. Michigan 2016-2017
  a year-long program that included: a two-day workshop before the beginning of the academic year, a two-hour meeting during the Fall semester, a two-hour meeting during the Winter semester, and a final dinner. There was also a course observation and midterm student feedback organized by the Center for Research on Learning and Teaching.
- "Creating an Inclusive Classroom Environment"; U. Michigan 05/2016
  a Center for Research on Learning and Teaching workshop
- Tier I Teaching Excellence Workshop; American Astronomical Society meeting 01/2014
  a two-day Center for Astronomy Education (CAE) Teaching Workshop: focused on various active learning techniques, with a particular emphasis on introductory level classes
- "Astronomy's Discoveries and Physics Education"; Colby College 06/2012
  a Gordon Physics Research & Education conference, about using recent discoveries in astrophysics in physics classes

Academic and Professional Service

Departmental Service

- Departmental Self Study Committee, member 2021 – 2022
- Astronomy Climate Task Force, member 2021 – present
- Chair Advisory Committee, elected member 2020 – 2021
- Heising-Simons Foundation representative and chair of internal 51 Peg b Fellowship selection committee 2020 – 2022
- Graduate admissions committee, member 2018, 2019, 2020
- Astronomy department Diversity, Equity, and Inclusion committee, chair and co-chair 2017-2018, 2020
  member Fall 2019
- Standing search / emerging talent committee, chair 2020 – 2021
  member 2014 – 2019
- Preliminary examination committee, member 2017, 2021
- U. Michigan weekly exoplanet journal club, founder and organizer 2017

University Service – University of Michigan

- Rackham Faculty Ally for Diversity 2020 – 2022
- Search Committee for the Dean of the College of Literature, Science, and the Arts 2018 – 2019
- NextProf Science: Diversifying Academia, panelist on "Making the Short List" 2019, 2021
  representative for Astronomy department 2017, 2019

Science Teams and Committees

- James Webb Space Telescope Guaranteed Time Observational Program "MANATEE" team 2021 – present
- American Astronomical Society Publication Committee 2021 – 2025
- Science Team for the Mid-infrared Extremely Large Telescope Imager and Spectrograph (METIS) 2020 – present
- James Webb Space Telescope Early Release Science team (over 100 people) 2017 – present
- Transiting Exoplanet Survey Satellite's Atmospheric Characterization Working Group 2017 – present

Scientific Review Panels

- Heising-Simons Foundation 51 Pegasi b Postdoctoral Fellowship Program, NASA Astrobiology Institute, NASA Astrophysics Theory Program, NASA Hubble Postdoctoral Fellowship Program, NASA Hubble Space Telescope TAC, NASA Origins of Solar Systems, NASA Spitzer Space Telescope TAC, NSF Division of Astronomical Sciences (Planetary Atmospheres), NSF Partnerships in Astronomy & Astrophysics Research and Education

Scientific Organizing Committees

- *Eclipsing Exoplanets 2020,* Viña Del Mar, Chile ~~12/2020~~ ~~*(2021?)*~~
- *Exoclimes V: The Diversity of Planetary Atmospheres,* Oxford, U.K. 08/2019
- *Multi-Dimensional Characterization of Distant Worlds: Spectral Retrieval and Spatial Mapping*, Ann Arbor, MI 10/2018
  Chair of SOC
- *High Resolution Spectroscopy for Exoplanet Atmospheres*, Nice, France 10/2018
- *The Origins of Volatiles in Habitable Planets,* Ann Arbor, MI 10/2017
- *Extreme Solar Systems III*, Waikoloa, HI 12/2015
- *The Solar-Stellar Connection: Influence of stars on their astrospheres,* Ann Arbor, MI 05/2015

Referee for Peer Reviewed Journals

- Astronomy & Astrophysics, Astrophysical Journal, Astrophysical Journal Letters, Icarus, Monthly Notices of the Royal Astronomical Society, Nature Astronomy, Nature, and Science

Additional Activities

- Recruiting/networking trips to National Society of Black Physicists meetings 2015, 2016, 2017, 2018, 2020
- U. Michigan Rackham Faculty Workshop on Graduate Admissions for Excellence and Diversity 2017
- U. Michigan Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE) workshop 2016
- U. Michigan Core Competency Seminar on Bystander Intervention 2016

Recent Public Outreach

- Speaker for Ann Arbor's Astronomy on Tap; Ann Arbor, MI 09/2019
- Press release for Dang et al. (2018) paper (see Publications)[a] 2018
- Speaker at annual Warren Astronomical Society banquet; Warren, MI 12/2017
- Guest on local CBS news show, "Michigan Matters", to discuss solar eclipse; Detroit, MI 08/2017
- Speaker at Wayne State's "Science Under the Dome" lecture series; Detroit, MI 02/2017
- Member of pre-concert science panel, for a performance of Holst's "The Planets"; Ann Arbor, MI 01/2017
- Speaker for Ann Arbor's Astronomy on Tap; Ann Arbor, MI 10/2016
- Speaker for the University Lowbrow Astronomers, local amateur astronomy club 05/2015
- Participant in science café at Conference for Undergraduate Women in Physics; Ann Arbor, MI 01/2015
- Speaker for University of Michigan *Saturday Morning Physics* series; Ann Arbor, MI 12/2014
- Keynote speaker at West Michigan Regional Undergraduate Science Research Conference; Grand Rapids, MI 11/2014

[a] https://news.umich.edu/wrong-way-hot-jupiter/

Refereed Publications

1. "ThERESA: Three-Dimensional Eclipse Mapping with Application to Synthetic JWST Data"
   Challener, R. & **Rauscher, E.**, AJ, 163, 117 (2022)
2. "No Umbrella Needed: Confronting the Hypothesis of Iron Rain on WASP-76b with Post-processed General Circulation Models"
   Savel, A. R., Kempton, E. M.-R., Malik, M., Komacek, T. D., Bean, J. L., May, E. M., Stevenson, K. B., Mansfield, M., & **Rauscher, E.**, ApJ, 926, 85 (2022)
3. "Exploring the effects of active magnetic drag in a General Circulation Model of the Ultrahot Jupiter WASP-76b"
   Beltz, H., **Rauscher, E.**, Roman, M., & Guilliat, A., AJ, 163, 35 (2022)
4. "Modeling the high-resolution emission spectra of clear and cloudy non-transiting hot Jupiters"
   Malsky, I., **Rauscher, E.**, Kempton, E., Roman, M., Long, D., & Harada, C., ApJ, 923, 62 (2021)
5. "Five new hot-Jupiter transits investigated with *Swift*-UVOT"
   Corrales, L., Ravi, S., King, G. W., May, E., **Rauscher, E.**, & Reynolds, M., AJ, 162, 287 (2021)
6. "Irradiation-driven escape of primordial planetary atmospheres I. The ATES photoionization hydrodynamics code"
   Caldiroli, A., Haardt, F., Gallo, E., Spinelli, R., Malsky, I., & **Rauscher, E.**, A&A, 655, 30 (2021)
7. "A solar C/O and sub-solar metallicity in a hot Jupiter atmosphere"
   Line, M. R., Brogi, M., Bean, J. L., Gandhi, S., Zalesky, J., Parmentier, V., Smith, P., Mace, G. N., Mansfield, M., Kempton, E. M.-R., Fortney, J. J., Shkolnik, E., Patience, J., **Rauscher, E.**, Desert, J.-M., & Wardenier, J. P., Nature, 598, 580 (2021)
8. "Spitzer phase curve observations and circulation models of the inflated ultra-hot Jupiter WASP-76b"
   May, E. M., Komacek, T. D., Stevenson, K. B., Kempton, E. M.-R., Bean, J. L., Malik, M., Ih, J., Mansfield, M., Savel, A. B., Deming, D., Desert, J.-M., Feng, Y. K., Fortney, J. J., Kataria, T., Lewis, N., Morley, C., **Rauscher, E.**, & Showman, A. P., AJ, 162, 158 (2021)
9. "Signatures of Clouds in Hot Jupiter Atmospheres: Modeled High Resolution Emission Spectra from 3D General Circulation Models"
   Harada, C. K., Kempton, E. M.-R., **Rauscher, E.**, Roman, M., Malsky, I., Brinjikji, M., & DiTomasso, V., ApJ, 909, 85 (2021)
10. "Clouds in Three-Dimensional Models of Hot Jupiters Over a Wide Range of Temperatures I: Thermal Structures and Broadband Phase Curve Predictions"
    Roman, M. T., Kempton, E. M.-R., **Rauscher, E.**, Harada, C. K., Bean, J. L., Stevenson, K. B., ApJ, 908, 101 (2021)
11. "A Significant Increase in Detection of High-Resolution Emission Spectra Using a Three-Dimensional Atmospheric Model of a Hot Jupiter"
    Beltz, H., **Rauscher, E.**, Brogi, M., & Kempton, E., AJ, 161, 1 (2021)
12. "Eigenspectra: A Framework for Identifying Spectra from 3D Eclipse Mapping"
    Mansfield, M., Schlawin, E., Lustig-Yeager, J., Adams, A. A., **Rauscher, E.**, Arcangeli, J., Feng, Y. K., Gupta, P., Keating, D., Stevenson, K. B., & Beatty, T. G, MNRAS, 499, 5151 (2020)
13. "Smaller than expected bright-spot offsets in the *Spitzer* phase curves of Qatar-1b"
    Keating, D., Stevenson, K. B., Cowan, N. B., **Rauscher, E.**, Bean, J. L., Bell, T., Dang, L., Deming, D., Désert, J.-M., Feng, Y. K., Fortney, J. J., Kataria, T., Kempton, E. M.-R., Lewis, N., Line, M. R., Mansfield, M., May, E., Morley, C., & Showman, A. P., AJ, 159, 225 (2020)
14. "From Super-Earths to Mini-Neptunes: Implications of a Surface on Atmospheric Circulation"
    May, E. M. & **Rauscher, E.**, ApJ, 893, 161 (2020)
15. "MOPPS II: Extreme Optical Scattering Slope for the Inflated Super-Neptune HATS-8b"
    May, E. M., Gardner, T., **Rauscher, E.**, & Monnier, J. D., AJ 159, 209 (2020)

16. "The High-Resolution Transmission Spectrum of HD 189733b Interpreted with Atmospheric Doppler Shifts from Three-Dimensional General Circulation Models"
Flowers, E., Brogi, M., **Rauscher, E.**, Kempton, E. M.-R., & Chiavassa, A., ApJ, 157, 209 (2019)
17. "Modeled Temperature-Dependent Clouds with Radiative Feedback in Hot Jupiter Atmospheres"
Roman, M. & **Rauscher, E.**, ApJ, 872, 1 (2019)
18. "A More Informative Map: Inverting Thermal Orbital Phase and Eclipse Lightcurves of Exoplanets"
Rauscher, E., Suri, V., & Cowan, N. B., AJ, 156, 235 (2018)
19. "The Transiting Exoplanet Community Early Release Science Program for JWST"
Bean, J., et al. (101 co-authors, including **Rauscher, E.**), PASP, 130, 114402 (2018)
20. "A Framework for Prioritizing the TESS Planetary Candidates Most Amenable to Atmospheric Characterization"
Kempton, E., et al. (41 co-authors, including **Rauscher, E.**), PASP, 130, 114401 (2018)
21. "MOPPS I: Flat Optical Spectra for the Hot Jupiters WASP-4b and WASP-52b"
May, E. M., Zhao, M., Haidar, M., **Rauscher, E.**, & Monnier, J. D., AJ, 156, 122 (2018)
22. "Detection of a westward hotspot offset in the atmosphere of hot gas giant CoRoT-2b"
Dang, L., Cowan, N. B., Schwartz, J. C., **Rauscher, E.**, Zhang, M., Knutson, H., Dobbs-Dixon, I., Line, M., Deming, D., Sundararajan, S., Fortney, J., Zhao, M., Nature Astronomy, 2, 220 (2018)
23. "Constraining Hot Jupiter Atmospheric Structure and Dynamics through Doppler Shifted Emission Spectra"
Zhang, J., Kempton, E., & **Rauscher, E.**, ApJ, 851, 84 (2017)
24. "Modeling the Effects of Inhomogeneous Aerosols on the Hot Jupiter Kepler-7b's Atmospheric Circulation"
Roman, M. & **Rauscher, E.**, ApJ, 850, 17 (2017)
25. "Models of Warm Jupiter Atmospheres: Observable Signatures of Obliquity"
Rauscher, E., ApJ, 846, 69 (2017)
26. "Examining Tatooine: Atmospheric Models of Circumbinary Planets"
May, E. M. & **Rauscher, E.**, ApJ, 826, 225 (2016)
27. "The Atmospheric Circulation and Observable Properties of Non-Synchronously Rotating Hot Jupiters"
Rauscher, E. & Kempton, E. M. R., ApJ, 790, 79 (2014)
28. "The Influence of Differential Irradiation and Circulation on the Thermal Evolution of Gas Giant Planets. I. Upper Limits from Radiative Equilibrium"
Rauscher, E. & Showman, A. P., ApJ, 784, 160 (2014)
29. "Three-Dimensional Atmospheric Circulation Models of HD 189733b and HD 209458b with Consistent Magnetic Drag and Ohmic Dissipation"
Rauscher, E. & Menou, K., ApJ, 764, 103 (2013)
30. "Constraining High Speed Winds in Exoplanet Atmospheres Through Observations of Anomalous Doppler Shifts During Transit"
Miller-Ricci Kempton, E. & **Rauscher, E.**, ApJ, 751, 117 (2012)
31. "A General Circulation Model for Gaseous Exoplanets with Double-Gray Radiative Transfer"
Rauscher, E. & Menou, K., ApJ, 750, 96 (2012)
32. "The Role of Drag in the Energetics of Strongly Forced Exoplanet Atmospheres"
Rauscher, E. & Menou, K., ApJ, 745, 78 (2012)
33. "Ohmic Dissipation in the Atmospheres of Hot Jupiters"
Perna, R., Menou, K., & **Rauscher, E.**, ApJ, 724, 313 (2010)
34. "Magnetic Drag on Hot Jupiter Atmospheric Winds"
Perna, R., Menou, K., & **Rauscher, E.**, ApJ, 719, 1421 (2010)

35. "Photometric and Spectral Signatures of Three-Dimensional Models of Transiting Giant Exoplanets"
    Burrows, A., **Rauscher, E.**, Spiegel, D., & Menou, K., ApJ, 719, 341 (2010)
36. "Three Dimensional Modeling of Hot Jupiter Atmospheric Flows"
    Rauscher, E. & Menou, K., ApJ, 714, 1334 (2010)
37. "Possible thermochemical disequilibrium in the atmosphere of the exoplanet GJ 436b"
    Stevenson, K., Harrington, J., Nymeyer, S., Madhusudhan, M., Seager, S., Bowman, W., Hardy, R., Deming, D., **Rauscher, E.**, & Lust, N., Nature, 464, 1161 (2010)
38. "Radiation-Hydrodynamics of Hot Jupiter Atmospheres"
    Menou, K. & **Rauscher, E.**, ApJ, 713, 1174 (2010)
39. "Atmospheric Circulation of Hot Jupiters: A Shallow Three-Dimensional Model"
    Menou, K. & **Rauscher, E.**, ApJ, 700, 887 (2009)
40. "On Signatures of Atmospheric Features in Thermal Phase Curves of Hot Jupiters"
    Rauscher, E., Menou, K., Cho, J. Y.-K., Seager, S., & Hansen, B., ApJ, 681, 1646 (2008)
41. "Toward Eclipse Mapping of Hot Jupiters"
    Rauscher, E., Menou, K., Seager, S., Deming, D., Cho, J. Y.-K., & Hansen, B., ApJ, 664, 1199 (2007)
42. "Hot Jupiter Variability in Eclipse Depth"
    Rauscher, E., Menou, K., Cho, J. Y.-K., Seager, S., & Hansen, B., ApJL, 662, 115 (2007)
43. "Ca II H and K Chromospheric Emission Lines in Late-K and M Dwarfs"
    Rauscher, E. and Marcy, G. W., PASP, 118, 617 (2006)

Submitted for Publication

- "Irradiation-driven escape of primordial planetary atmospheres II. Evaporation efficiency of sub-Neptunes through hot Jupiters"
  Caldiroli, A., Haardt, F., Gallo, E., Spinelli, R., Malsky, I., & **Rauscher, E.**, submitted to A&A, arXiv:2112.00744
- "SPORK That Spectrum: Increasing Detection Significances from High-Resolution Exoplanet Spectroscopy with Novel Smoothing Algorithms"
  Rasmussen, K. C., Brogi, M., Rahman, F., **Rauscher, E.**, Beltz, H., & Ji, A. P., submitted to AAS Journals, arXiv:2108.12057
- "The Sensitivity of Eclipse Mapping to Planetary Rotation"
  Adams, A. & **Rauscher, E.**, submitted to AAS Journals, arXiv:2112.07667
- "A New Analysis of 8 *Spitzer* Phase Curves and Hot Jupiter Population Trends: QATAR-1b, QATAR-2b, WASP-52b, WASP-34b, and WASP-140b"
  May, E., Stevenson, K., Bean, J., Bell, T., Cowan, N., Dang, L., Desert, J.-M., Fortney, J., Keating, D., Kempton, E., Komacek, T., Lewis, N., Mansfield, M., Morley, C., Parmentier, V., **Rauscher, E.**, Swain, M., Zellem, R., & Showman, A., submitted to AAS Journals

Non-Refereed Publications

- "Keys of a Mission to Uranus or Neptune, the Closest Ice Giants"
  Guillot, T., Fortney, J., **Rauscher, E.**, Marley, M. S., Parmentier, V., Line, M., Wakeford, H., Kaspi, Y., Helled, R., Ikoma, M., Knutson, H., Menou, K., Valencia, D., Durante, D., Ida, S., Bolton, S. J., Li, C., Stevenson, K. B., Bean, J., Cowan, N. B., Hofstadter, M. D., Hueso, R., Leconte, J., Li, L., Mordasini, C., Mousis, O., Nettelmann, N., Soderlund, K., & Wong, M. H., White Paper for the Decadal Survey of Planetary Sciences and Astrobiology, arXiv:2012.09863 (2020)

- "Clearing up the Clouds on Hot Exoplanets", News and Views article
  Cowan, N. B. & **Rauscher, E.**, Nature Astronomy, 4, 923 (2020)
- "It's Time to Eliminate the GRE and PGRE in All Astronomy & Astrophysics PhD Programs: Motivation, Implementation and Outcomes"
  Burgasser, A., Aarnio, A., Abazajian, K. N., Agüeros, M., Barranco, J. A., Berta-Thompson, Z. K., Brown, B. P., Casey, C., Charbonneau, D., Coble, K.,Donahue, M., Gallagher, S., Greene, J., Horst, S., Konopacky, Q., Miller, C., Monkiewicz, J., Posselt, J., Ramirez-Ruiz, E., **Rauscher, E.**, Redfield, S., Rudolph, A. L., Sandstrom, K., & Venkatesan, A., Astro2020: Decadal Survey on Astronomy and Astrophysics, APC white papers, no. 38; Bulletin of the American Astronomical Society, 51, 38 (2019)