JUAN M. LORA

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Appointments and Research Experience

Associate Professor 2026–present
Director of Undergraduate Studies 2025–present
Assistant Professor 2019–2025
Department of Earth and Planetary Sciences, Yale University

Visiting Assistant Researcher 2019
Postdoctoral Fellow 2014–2018
Department of Earth, Planetary, and Space Sciences,
University of California, Los Angeles

Graduate Research and Teaching Assistant 2009–2014
Department of Planetary Sciences, University of Arizona

Research Associate, NASA Academy, Goddard Space Flight Center 2008

Undergraduate Researcher, University of Southern California 2007–2009

Education

Ph.D., Planetary Sciences, University of Arizona 2014
B.S., Astronomy, *magna cum laude*, University of Southern California 2009

Mission Involvement

Dragonfly Co-Investigator, 2017–present
NASA's *Dragonfly* mission to Titan (New Frontiers 4)

Honors and Awards

Arthur Greer Memorial Prize for Outstanding Research, Yale University	2023
Harold C. Urey Prize in Planetary Science, AAS Division for Planetary Sciences	2022
NASA Planetary Science Early Career Award	2022
Ronald Greeley Early Career Award, American Geophysical Union	2020
NASA Planetary Science Early Career Fellowship	2017
Gerard P. Kuiper Memorial Award, University of Arizona	2014
College of Science Graduate Teaching/Mentoring Award, University of Arizona	2011
Golden Key International Honour Society	2010
Renaissance Scholar Award, USC	2009
Phi Beta Kappa Undergraduate Award	2009
Dean Joan M. Schaefer Scholarship	2007–2009
USC Provost's Undergraduate Research Fellowship	2007–2009
Albert Fisher Science Scholarship	2007–2008

Refereed Publications

† *Yale advisee*

Book Chapters:

1. **Lora, J.M.**, E.P. Turtle, and J.L. Mitchell (2025). Titan's weather, climate, and paleoclimate. In: *Titan After Cassini-Huygens* (COSPAR Book Series). R. Lopes, C. Elachi, I. Mueller-Wodarg, and A. Solomonidou, Eds. Elsevier, pp. 201–237. https://doi.org/10.1016/B978-0-323-99161-2.00002-4
2. †Battalio, J.M., M. Cohen, P. Read, **J.M. Lora**, T. McConnachie, and K. McGouldrick (2024). Oscillations in terrestrial planetary atmospheres. In: *Atmospheric Oscillations: Sources of Subseasonal-to-Seasonal Variability and Predictability.* B. Guan, Ed. Elsevier, pp. 399–441. https://doi.org/10.1016/B978-0-443-15638-0.00019-8

Journal Articles:

3. Shultis, J., D.W. Waugh, A.D. Toigo, †N.A. Lombardo, and **J.M. Lora** (2026). Impact of Titan's polar vortex on the transport of chemical species. *Journal of Geophysical Research: Planets* 131, e2025JE009367. https://doi.org/10.1029/2025JE009367
4. †Scholz, S.R. and **J.M. Lora** (2025). Widespread increase in atmospheric river frequency and impacts over the 20th century. *AGU Advances* 6, e2025AV001888. https://doi.org/10.1029/2025AV001888
5. Schnaubelt, J.C., C.R. Tabor, B.L. Otto-Bliesner, and **J.M. Lora** (2025). Atmospheric river impacts on the Greenland Ice Sheet through the Last Interglacial. *AGU Advances* 6, e2025AV001653. https://doi.org/10.1029/2025AV001653
6. †Han, S. and **J.M. Lora** (2025). Thermal inertia controls on Titan's surface temperature and planetary boundary layer structure. *Planetary Science Journal* 6, 222. https://doi.org/10.3847/PSJ/adfed1
7. Marlin, T.C., E.F. Young, K. de Kleer, M. Cordiner, †N.A. Lombardo, I. de Pater, **J.M. Lora**, P. Corlies, R. Cosentino, C. Nixon, S. Rodriguez, and A. Thelen (2025). Zonal winds in Titan's middle atmosphere from a stellar occultation observed with Keck adaptive optics. *Planetary Science Journal* 6, 286. https://doi.org/10.3847/PSJ/ae03a6
8. †Baek, S.H., **J.M. Lora**, C.B. Skinner, M. Fu, and J. Zhu (2025). Atmospheric and oceanic energy transport during North Atlantic freshening events: influences of moisture transport and hydrologic cycle feedbacks. *Climate Dynamics* 63, 301. https://doi.org/10.1007/s00382-025-07761-1
9. Hill, S.A., S. Bordoni, J.L. Mitchell, and **J.M. Lora** (2025). Interpreting seasonal and interannual Hadley cell descending edge migrations via the cell-mean Rossby number. *Journal of Climate* 38, 5505–5520. https://doi.org/10.1175/JCLI-D-24-0678.1
10. Seltzer, A.M., R.L. Tyne, I. Musan, J.B. Langman, D.J. Amaya, K.B. Karnauskas, **J.M. Lora**, G.J. Bowen, P.H. Barry, M. Costantini, M.W. Broadley, W.J. Jenkins, and D.V. Bekaert (2025). Past aquifer responses to climate recorded by fossil groundwater. *Science Advances* 11, eadu7812. https://doi.org/10.1126/sciadv.adu7812
11. Wright, L., N.A. Teanby, P.G.J. Irwin, C.A. Nixon, †N.A. Lombardo, **J.M. Lora**, and D. Mitchell (2025). Seasonal evolution of Titan's stratospheric tilt and temperature field at high resolution from Cassini/CIRS. *Planetary Science Journal* 6, 114. https://doi.org/10.3847/PSJ/adcab3
12. Nixon, C., B. Bézard, T. Cornet, B. Coy, I. de Pater, M. Es-Sayeh, H. Hammel, E. Lellouch, †N. Lombardo, M. López-Puertas, **J.M. Lora**, and 34 co-authors (2025). Titan's atmosphere in late northern summer from JWST and Keck observations. *Nature Astronomy* 9, 969–981. https://doi.org/10.1038/s41550-025-02537-3
13. †Battalio, J.M., **J.M. Lora**, S.W. Lubis, and P. Hassanzadeh (2025). Propagation and periodicity of Mars's northern annular mode modulates the dust cycle. *Geophysical Research Letters* 52, e2024GL112814. http://dx.doi.org/10.1029/2024GL112814
14. †Rush, W.D., **J.M. Lora**, C. Skinner, †S. Menemenlis, and 21 co-authors (2025). Atmospheric river detection under changing seasonality and mean-state climate: ARTMIP tier 2 paleoclimate experiments. *Journal of Geophysical Research: Atmospheres* 130, e2024JD042222. https://doi.org/10.1029/2024JD042222
15. †Olim, E., **J.M. Lora**, and †J.M. Battalio (2025). Methane storm characteristics and evolution in simulations of Titan's hydroclimate. *Icarus* 425, 116290. https://doi.org/10.1016/j.icarus.2024.116290
16. †Scholz, S.R. and **J.M. Lora** (2024). Atmospheric rivers cause warm winters and extreme heat events. *Nature* 636, 640–646. https://doi.org/10.1038/s41586-024-08238-7

17. **Lora, J.M.** (2024). Moisture transport and the methane cycle of Titan's lower atmosphere. *Icarus* 422, 116241 (Invited Contribution). https://doi.org/10.1016/j.icarus.2024.116241

18. †Battalio, J.M. and **J.M. Lora** (2024). Increases in the local eddy energetics of the extratropical atmosphere over the last four decades. *Journal of Climate* 37, 3283–3304. https://doi.org/10.1175/JCLI-D-22-0930.1

19. Williams⋆, D.A., X. Ji⋆, P. Corlies⋆, and **J.M. Lora** (2024). Clouds and seasonality on terrestrial planets with varying rotation rates. *Astrophysical Journal* 963, 36. https://doi.org/10.3847/1538-4357/ad192f
⋆*2022 Rossbypalooza summer school advisees*

20. Chatain, A., S.C.R. Rafkin, A. Soto, E. Moisan, **J.M. Lora**, A. Le Gall, R. Hueso, and A. Spiga (2024). The impact of lake shape and size on lake breezes and air–lake exchanges on Titan. *Icarus* 411, 115925. https://doi.org/10.1016/j.icarus.2023.115925

21. †Lombardo, N.A. and **J.M. Lora** (2023). The heat and momentum budgets of Titan's middle atmosphere. *Journal of Geophysical Research: Planets* 128, e2023JE008061. https://doi.org/10.1029/2023JE008061

22. Oster, J.L., S. Macarewich, M. Lofverstrom, C. de Wet, I. Montañez, **J.M. Lora**, C. Skinner, and C. Tabor (2023). North Atlantic meltwater during Heinrich Stadial 1 drives wetter climate with more atmospheric rivers in western North America. *Science Advances* 9, eadj222. https://doi.org/10.1126/sciadv.adj2225

23. **Lora, J.M.**, C.B. Skinner, †W.D. Rush, and †S.H. Baek (2023). The hydrologic cycle and atmospheric rivers in CESM2 simulations of the Last Glacial Maximum. *Geophysical Research Letters* 50, e2023GL104805. https://doi.org/10.1029/2023GL104805

24. Lewis, N.T., †N.A. Lombardo, P.L. Read, and **J.M. Lora** (2023). Equatorial waves and superrotation in the stratosphere of a Titan general circulation model. *Planetary Science Journal* 4, 149. https://doi.org/10.3847/PSJ/ace76f

25. †Baek, S.H., Y. Kanzaki, **J.M. Lora**, N. Planavsky, C.T. Reinhard, and S. Zhang (2023). Impact of climate on the global capacity for enhanced rock weathering on croplands. *Earth's Future* 11, e2023EF003698. http://dx.doi.org/10.1029/2023EF003698

26. Birch, S.P.D., G. Parker, P. Corlies, J.M. Soderblom, J.W. Miller, R.V. Palermo, **J.M. Lora**, A.D. Ashton, A.G. Hayes, and J.T. Perron (2023). Reconstructing river flows remotely on Earth, Titan, and Mars. *Proceedings of the National Academy of Sciences* 120, e2206837120. https://doi.org/10.1073/pnas.2206837120

27. Shields, C.A., et al. (including **J.M. Lora**) (2023). Future atmospheric rivers and impacts on precipitation: Overview of the ARTMIP Tier 2 high-resolution global warming experiment. *Geophysical Research letters* 50, e2022GL102091. https://doi.org/10.1029/2022GL102091

28. †Baek, S.H., †J.M. Battalio, and **J.M. Lora** (2023). Atmospheric river variability over the last millennium driven by annular modes. *AGU Advances* 4, e2022AV000834. https://doi.org/10.1029/2022AV000834

29. Skinner, C.B., **J.M. Lora**, C. Tabor, J. Zhu (2023). Atmospheric river contributions to ice sheet hydroclimate at the Last Glacial Maximum. *Geophysical Research Letters* 50, e2022GL101750. https://doi.org/10.1029/2022GL101750

30. †Lombardo, N.A. and **J.M. Lora** (2023). Influence of observed seasonally varying composition on Titan's stratospheric circulation. *Icarus* 390, 115291. https://doi.org/10.1016/j.icarus.2022.115291

31. Lee, H.-I., J.L. Mitchell, **J.M. Lora**, and A. Tripati (2023). Influence of stationary waves on precipitation change in North American summer during the Last Glacial

Maximum. *Journal of Climate* 36, 3165–3182. https://doi.org/10.1175/JCLI-D-21-0886.1

32. †Menemenlis, S., S.M. White, D.E. Ibarra, and **J.M. Lora** (2022). A proxy-model comparison for mid-Pliocene warm period hydroclimate in the Southwestern US. *Earth and Planetary Science Letters* 596, 117803. https://doi.org/10.1016/j.epsl.2022.117803

33. Lewis-Merrill, R.A., S. Moon, J.L. Mitchell, and **J.M. Lora** (2022). Assessing environmental factors of alluvial fan formation on Titan. *Planetary Science Journal* 3, 223. https://doi.org/10.3847/PSJ/ac8d09

34. **Lora, J.M.**, †J.M. Battalio, †M. Yap, and †C. Baciocco (2022). Topographic and orbital forcing of Titan's hydroclimate. *Icarus* 384, 115095. https://doi.org/10.1016/j.icarus.2022.115095

35. †Baek, S.H., Y. Kushnir, M. Ting, J.E. Smerdon, and **J.M. Lora** (2022). Regional signatures of forced North Atlantic SST variability: A limited role for aerosols and greenhouse gases. *Geophysical Research Letters* 49, e2022GL097794. https://doi.org/10.1029/2022GL097794

36. Marquardt Collow, A., C.A. Shields, B. Guan, S. Kim, **J.M. Lora**, and 15 co-authors (2022). An overview of ARTMIP's Tier 2 reanalysis intercomparison: Uncertainty in the detection of atmospheric rivers and their associated precipitation. *Journal of Geophysical Research: Atmospheres* 127, e2021JD036155. https://doi.org/10.1029/2021JD036155

37. Comola, F., J. Kok, **J.M. Lora**, K. Cohanim, X. Yu, C. He, P. McGuiggan, S. Hörst, and F. Turney (2022). Titan's prevailing circulation might drive highly intermittent, yet significant sediment transport. *Geophysical Research Letters* 49, e2022GL097913. https://doi.org/10.1029/2022GL097913

38. O'Brien, T.A., et al. (including **J.M. Lora**) (2022). Increases in future AR count and size: Overview of the ARTMIP Tier 2 CMIP5/6 experiment. *Journal of Geophysical Research: Atmospheres* 127, e2021JD036013. https://doi.org/10.1029/2021JD036013

39. Amaya, D.J., A.M. Seltzer, K.B. Karnauskas, **J.M. Lora**, X. Zhang, and P.N. DiNezio (2022). Air-sea coupling shapes North American hydroclimate response to ice sheets during the Last Glacial Maximum. *Earth and Planetary Science Letters* 578, 117271. https://doi.org/10.1016/j.epsl.2021.117271

40. Rafkin, S., **J.M. Lora**, A. Soto, and †J.M. Battalio (2022). The interaction of deep convection with the general circulation in Titan's atmosphere. Part 1: Cloud resolving simulations. *Icarus* 373, 114755. https://doi.org/10.1016/j.icarus.2021.114755

41. †Battalio, J.M., **J.M. Lora**, S. Rafkin, and A. Soto (2022). The interaction of deep convection with the general circulation in Titan's atmosphere. Part 2: Impacts on the climate. *Icarus* 373, 114623. https://doi.org/10.1016/j.icarus.2021.114623

42. Rodriguez, S., et al. (including **J.M. Lora**) (2022). Science goals and new mission concepts for a future exploration of Titan's atmosphere, geology and habitability: Titan POlar Scout/orbiteEr and In situ lake lander and DrONe explorer (POSEIDON). *Experimental Astronomy* 54, 911–973. https://doi.org/10.1007/s10686-021-09815-8

43. †Baek, S.H., Y. Kushnir, W.A. Robinson, **J.M. Lora**, D.E. Lee, M. Ting (2021). An atmospheric bridge between subpolar and tropical Atlantic regions: A perplexing asymmetric teleconnection. *Geophysical Research Letters* 48, e2021GL096602. https://doi.org/10.1029/2021GL096602

44. †Baek, S.H. and **J.M. Lora** (2021). Counterbalancing influences of aerosols and greenhouse gases on atmospheric rivers. *Nature Climate Change* 11, 958–965. https://doi.org/10.1038/s41558-021-01166-8

45. †Battalio, J.M. and **J.M. Lora** (2021). Global impacts from high-latitude storms on Titan. *Geophysical Research Letters* 48, e2021GL094244. https://doi.org/10.1029/2021GL094244

46. †Battalio, J.M. and **J.M. Lora** (2021). Annular modes of variability in the atmospheres of Mars and Titan. *Nature Astronomy* 5, 1139–1147. https://doi.org/10.1038/s41550-021-01447-4

47. †Menemenlis, S.A., **J.M. Lora**, M. Lofverstrom, and D. Chandan (2021). Influence of stationary waves on mid-Pliocene atmospheric rivers and hydroclimate. *Global and Planetary Change* 204, 103557. https://doi.org/10.1016/j.gloplacha.2021.103557

48. Nichols-Fleming, F., P. Corlies, A.G. Hayes, M. Ádámkovics, P. Rojo, S. Rodriguez, E.P. Turtle, **J.M. Lora**, and J.M. Soderblom (2021). Tracking short-term variations in the haze distribution of Titan's atmosphere with SINFONI VLT. *Planetary Science Journal* 2, 180. https://doi.org/10.3847/PSJ/abffd7

49. Barnes, J.W., et al. (including **J.M. Lora**) (2021). Science goals and objectives for the Dragonfly Titan rotorcraft relocatable lander. *Planetary Science Journal* 2, 130. https://doi.org/10.3847/PSJ/abfdcf

50. MacKenzie, S.M., S.P.D. Birch, S. Hörst, C. Sotin, E. Barth, **J.M. Lora**, and 27 co-authors (2021). Titan: Earth-like on the outside, Ocean World on the inside. *Planetary Science Journal* 2, 112. https://doi.org/10.3847/PSJ/abf7c9

51. Kageyama, M., S.P. Harrison, M.-L. Kapsch, M. Lofverstrom, **J.M. Lora**, and 24 co-authors (2021). The PMIP4 Last Glacial Maximum experiments: preliminary results and comparison with the PMIP3 simulations. *Climate of the Past* 17, 1065–1089. https://doi.org/10.5194/cp-17-1065-2021

52. **Lora, J.M.**, C.A. Shields, and J.J. Rutz (2020). Consensus and disagreement in atmospheric river detection: ARTMIP global catalogues. *Geophysical Research Letters* 47, e2020GL089302. https://doi.org/10.1029/2020GL089302

53. Skinner, C.B., **J.M. Lora**, A.E. Payne, and C.J. Poulsen (2020). Atmospheric river changes shaped mid-latitude hydroclimate since the mid-Holocene. *Earth and Planetary Science Letters* 541, 116293. https://doi.org/10.1016/j.epsl.2020.116293

54. Rehfeld, K., R. Hébert, **J.M. Lora**, M. Lofverstrom, and C.M. Brierley (2020). Variability of surface climate in simulations of past and future. *Earth System Dynamics* 11, 447–468. https://doi.org/10.5194/esd-11-447-2020

55. O'Brien, T.A., et al. (including **J.M. Lora**) (2020). Detection uncertainty matters for understanding atmospheric rivers. *Bulletin of the American Meteorological Society* 101, E790–E796. https://doi.org/10.1175/BAMS-D-19-0348.1

56. Dixit, Y., S. Toucanne, C. Fontanier, V. Pasquier, **J.M. Lora**, G. Jouet, and A. Tripati (2020). Enhanced western Mediterranean rainfall during past interglacials driven by North Atlantic pressure changes. *Quaternary International* 553, 1–13. https://doi.org/10.1016/j.quaint.2020.08.017

57. Santi, L.M., A.J. Arnold, D.E. Ibarra, C.A. Whicker, J.A. Mering, R.B. Lomarda, **J.M. Lora**, and A. Tripati (2020). Clumped isotope constraints on changes in latest Pleistocene hydroclimate in the northwestern Great Basin: Lake Surprise, California. *GSA Bulletin* 132, 2669–2683. https://doi.org/10.1130/B35484.1

58. Faulk⋆, S.P., **J.M. Lora**⋆, J.L. Mitchell, and P.C.D. Milly (2020). Titan's climate patterns and surface methane distribution due to the coupling of land hydrology and atmosphere. *Nature Astronomy* 4, 390–398. https://doi.org/10.1038/s41550-019-0963-0
⋆*equal-contribution authors*

59. Rutz, J.J., C.A. Shields, **J.M. Lora**, and 35 co-authors (2019). The Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Quantifying uncertainties in atmospheric river climatology. *Journal of Geophysical Research: Atmospheres* 124, 13,777–13,802. https://doi.org/10.1029/2019JD030936

60. **Lora, J.M.** and D.E. Ibarra (2019). The North American hydrologic cycle through the last deglaciation. *Quaternary Science Reviews* 226, 105991 (Invited Contribution). https://doi.org/10.1016/j.quascirev.2019.105991

61. Lee, H.-I., J.L. Mitchell, A. Tripati, **J.M. Lora**, G. Chen, and Q. Ding (2019). North Atlantic and Pacific quasi-stationary parts of atmospheric rivers and their implications for East Asian monsoon onset. *Geophysical Research Letters* 46, 12311–12320. https://doi.org/10.1029/2019GL084272

62. **Lora, J.M.**, T. Tokano, J. Vatant d'Ollone, S. Lebonnois, and R.D. Lorenz (2019). A model intercomparison of Titan's climate and low-latitude environment. *Icarus* 333, 113–126. https://doi.org/10.1016/j.icarus.2019.05.031

63. MacKenzie, S.M., **J.M. Lora**, and R.D. Lorenz (2019). A thermal inertia map of Titan. *Journal of Geophysical Research: Planets* 124, 1728–1742. https://doi.org/10.1029/2019JE005930

64. Molaro, J.L., M. Choukroun, C. Phillips, E. Phelps, R. Hodyss, K. Mitchell, **J.M. Lora**, and G. Meirion-Griffith (2019). The microstructural evolution of water ice in the solar system through sintering. *Journal of Geophysical Research: Planets* 124, 243–277. https://doi.org/10.1029/2018JE005773

65. Hill, S.A., **J.M. Lora**, N. Khoo, S.P. Faulk, and J. Aurnou (2018). Affordable rotating fluid demonstrations for geoscience education: The DIYnamics project. *Bulletin of the American Meteorological Society* 99, 2529–2538. https://doi.org/10.1175/BAMS-D-17-0215.1

66. **Lora, J.M.** (2018). Components and mechanisms of hydrologic cycle changes over North America at the Last Glacial Maximum. *Journal of Climate* 31, 7035–7051. https://doi.org/10.1175/JCLI-D-17-0544.1

67. Shields, C.A., J.J. Rutz, L.R. Leung, F.M. Ralph, M. Wehner, B. Kawzenuk, **J.M. Lora**, and 32 co-authors (2018). Atmospheric River Tracking Method Intercomparison Project (ARTMIP): Experimental design and project goals. *Geoscientific Model Development* 11, 2455–2474. https://doi.org/10.5194/gmd-2017-295

68. Turtle, E.P., J.E. Perry, J.M. Barbara, A.D. Del Genio, S. Rodriguez, C. Sotin, **J.M. Lora**, S. Faulk, P. Corlies, J. Kelland, S.M. MacKenzie, R.A. West, A.S. McEwen, J.I. Lunine, J. Pitesky, T.L. Ray, and M. Roy (2018). Titan's meteorology over the Cassini mission: Evidence for extensive subsurface methane reservoirs. *Geophysical Research Letters* 45, 5320–5328. https://doi.org/10.1029/2018GL078170

69. **Lora, J.M.**, T. Kataria, and P. Gao (2018). Atmospheric circulation, chemistry, and infrared spectra of Titan-like exoplanets around different stellar types. *Astrophysical Journal* 853, 58–67. https://doi.org/10.3847/1538-4357/aaa132

70. Faulk, S.P., S. Moon, J.L. Mitchell, and **J.M. Lora** (2017). Regional patterns of extreme precipitation on Titan consistent with observed alluvial fan distribution. *Nature Geoscience* 10, 827–831. https://doi.org/10.1038/ngeo3043

71. Löfverström, M. and **J.M. Lora** (2017). Abrupt regime shifts in the North Atlantic atmospheric circulation over the last deglaciation. *Geophysical Research Letters* 44, 8047–8055. https://doi.org/10.1002/2017GL074274

72. **Lora, J.M.**, J.L. Mitchell, C. Risi, and A.E. Tripati (2017). North Pacific atmospheric rivers and their influence on North America at the Last Glacial Maximum. *Geophysical Research Letters* 44, 1051–1059. https://doi.org/10.1002/2016GL071541

73. **Lora, J.M.** and M. Ádámkovics (2017). The near-surface methane humidity on Titan. *Icarus* 286, 270–279. https://doi.org/10.1016/j.icarus.2016.10.012

74. **Lora, J.M.**, J.L. Mitchell, and A.E. Tripati (2016). Abrupt reorganization of North Pacific and western North American climate during the last deglaciation. *Geophysical Research Letters* 43, 11796–11804. https://doi.org/10.1002/2016GL071244

75. Mitchell, J.L. and **J.M. Lora** (2016). The climate of Titan. *Annual Reviews of Earth and Planetary Science* 44, 353–380 (Invited Contribution). https://doi.org/10.1146/annurev-earth-060115-012428

76. McDonald, G.D., A.G. Hayes, R.C. Ewing, **J.M. Lora**, C.E. Newman, T. Tokano, A. Lucas, A. Soto, and G. Chen (2016). Variations in Titan's dune orientations as a result of orbital forcing. *Icarus* 270, 197–210. https://doi.org/10.1016/j.icarus.2015.11.036

77. Neish, C.D., J.L. Molaro., **J.M. Lora**, A.D. Howard, R.L. Kirk, P. Schenk, V.J. Bray, and R.D. Lorenz (2016). Fluvial erosion as a mechanism for crater modification on Titan. *Icarus* 270, 114–129. https://doi.org/10.1016/j.icarus.2015.07.022

78. **Lora, J.M.** and J.L. Mitchell (2015). Titan's asymmetric lake distribution mediated by methane transport due to atmospheric eddies. *Geophysical Research Letters* 42, 6213–6220. https://doi.org/10.1002/2015GL064912

79. **Lora, J.M.**, J.I. Lunine, and J.L. Russell (2015). GCM simulations of Titan's middle and lower atmosphere and comparison to observations. *Icarus* 250, 516–528. https://doi.org/10.1016/j.icarus.2014.12.030

80. **Lora, J.M.**, J.I. Lunine, J.L. Russell, and A.G. Hayes (2014). Simulations of Titan's paleoclimate. *Icarus* 243, 264–273. https://doi.org/10.1016/j.icarus.2014.08.042

81. Griffith, C.A., **J.M. Lora**, J. Turner, P.F. Penteado, R.H. Brown, M.G. Tomasko, L. Doose, and C. See (2012). Possible tropical lakes on Titan from observations of dark terrain. *Nature* 486, 237–239. https://doi.org/10.1038/nature11165

82. **Lora, J.M.**, P.J. Goodman, J.L. Russell, and J.I. Lunine (2011). Insolation in Titan's troposphere. *Icarus* 216, 116–119. https://doi.org/10.1016/j.icarus.2011.08.017

Funded Grants and Fellowships

Current:

NSF Frontier Research in Earth Sciences: *Collaborative Research: Testing the impact of land plants on the Earth system* (Co-Principal Investigator)	2024–2028
NASA New Frontiers Program: *Dragonfly* mission to Titan, Phases B–D (Co-Investigator)	2019–2028
NASA Cassini Data Analysis Program: *Understanding the global structure and seasonal behavior of Titan's planetary boundary layer* (Principal Investigator)	2025–2027
NASA FINESST: *Investigating the atmospheric circulation of Uranus with global climate modeling* (Principal Investigator*) *Future Investigator is C. Keaveney, student advisee	2025–2027
NASA Solar System Observations: *Winds of change: a multi-decade study of Titan's middle atmosphere across seasons* (Co-Investigator)	2024–2027
NASA Planetary Science Early Career Award: *Disseminating the science of planetary atmospheres and climates* (Principal Investigator)	2022–2027
NASA Cassini Data Analysis Program: *Climate change on Titan due to Saturn's billion-year obliquity evolution* (Co-Investigator)	2024–2026
DOE Earthshots: Carbon Negative Shot: *Carbon dioxide removal and high-performance computing: Planetary boundaries of Earth shots* (Co-Principal Investigator)	2023–2026

NASA Interdisciplinary Consortia for Astrobiology Research: *Alternative Earths – how to build and sustain a detectable biosphere* (Co-Investigator) 2020–2026

Previous:

NSF P2C2: *Collaborative Research: An integrated model-proxy approach to understanding Western US hydroclimate change since the last glacial period* (Co-Principal Investigator) 2021–2024

NASA Mars Data Analysis Program: *Annular modes of variability in the Martian atmosphere* (Co-Investigator*) 2021–2024
*Principal Investigator was J.M. Battalio, postdoctoral advisee

Yale Planetary Solutions Project Seed Grants: *Simulating Pliocene climate as a blueprint for future warming: From cloud physics and ocean circulation to extreme precipitation and droughts* (Co-Investigator) 2022–2023

NASA Cassini Data Analysis Program: *The dynamics and seasonal evolution of Titan's polar vortex* (Principal Investigator) 2020–2022

NASA Cassini Data Analysis Program: *DeltaT: Dynamics and detectability of deltas on Titan* (Co-Investigator) 2020–2022

NSF P2C2: *Collaborative Research: Elucidating the drivers and consequences of changes in atmospheric rivers from the Last Glacial Maximum to the present day* (Co-Principal Investigator) 2019–2022

NASA Solar System Workings: *The role of moist convection in Titan's hydrologic cycle and general circulation* (Principal Investigator) 2017–2020

University of California Chancellor's Postdoctoral Fellowship 2017–2019

California Alliance (NSF-AGEP) Postdoctoral Fellowship 2017–2019

NASA Cassini Data Analysis and Participating Scientist Program: *Understanding the controlling factors of Titan's climate, weather and methane hydrology in space and time* (Co-Investigator) 2016–2019

NSF AGS Postdoctoral Fellowship: *Impacts of large-scale dynamics on regional climate sensitivity: Model-paleodata comparisons in three mid-latitude regions* (Principal Investigator) 2015–2017

NASA Earth and Space Science Fellowship: *Modeling Titan's atmospheric dynamics and interaction with methane* (Student Investigator) 2012–2014

Advising and Mentoring

Yale Associate Research Scientists:

J. Michael Battalio (now Research Scientist at Yale) 2022–2025

Yale Postdoctoral Advisees:

Bowen Fan 2025–present
Seung Hun Baek (now Researcher at LLNL) 2020–2023
William Rush (now Assistant Professor at Santa Clara University) 2022–2023
J. Michael Battalio (now Research Scientist at Yale) 2019–2022

Yale Graduate Students:

Caleb Keaveney 2023–present
Sooman Han 2022–present
Serena Yang (née Scholz) 2022–present
Nicholas Lombardo (PhD 2025; now Adjunct Lecturer, CCSU) 2019–2025

Yiming Bian (minor discourse) 2025–present
Kendra Nguyen (Astronomy minor project) 2025–present
Demetra Yancopoulos (minor discourse) 2024–present

Annika Margevich (minor discourse)	2021–present
Ashley Arroyo (minor discourse; PhD 2025)	2020–2025
Zhiyuan Li (minor discourse; PhD 2025)	2019–2025
Guillaume Delaviel (minor discourse; MSc 2022)	2019–2021

Other Yale Doctoral Committees:

Anastasiia Chupakhina	2025–present
Jennifer Kosty	2023–present
Paul Curtis	2021–present
Elizabeth Bailey	2020–present
Jingjun Liu	2020–present
Sam De Abreu	2023–2024
Manpreet Singh (MSc 2023)	2019–2023
Yu Liang (PhD 2023)	2019–2022
Ulla Heede (PhD 2022)	2019–2022

External Graduate Students:

Jan Vatant d'Ollone (PhD 2020, Sorbonne Université; doctoral committee)	2020
Hung-I Lee (PhD 2019, UCLA; research collaborator and advisor)	2015–2019
Sean Faulk (PhD 2018, UCLA; research collaborator and advisor)	2014–2018

Yale Postgraduate Advisees:

Sofia Menemenlis (now PhD candidate at Princeton)	2020–2021

Yale Undergraduate Senior Theses Supervised:

Kenny Phan (Astronomy, co-advised with Malena Rice)	2026–present
Sophia Getz (Physics)	2023–2024
Alyse Olcott (EPS)	2023–2024
Kunsang Dorjee (Physics)	2022
Nicholas Archambault (Physics)	2020–2021
Colin Baciocco (EPS)	2020–2021
Mary Yap (EPS)	2020–2021
Sofia Menemenlis (EPS)	2019–2020
Michael Machado (Physics)	2019

Yale Undergraduate Research Advisees:

Jas Hollis	2025–present
Ethan Olim	2022–2024
Jaden Uram	2023–2024
Alyse Olcott	2023–2024
Kunsang Dorjee	2019–2022
Juliana Surprenant	2020–2021
Nicholas Archambault	2019–2021

Other Undergraduate Research Advisees:

Chloe Whicker, UCLA	2017–2019
Alexandrea Arnold, UCLA	2016–2017
Shelley Cheng, UCLA	2016–2017
Raul Reyes, UCLA	2016–2017
Tyler Vollmer, UCLA	2015–2016

Teaching

Yale Courses:

EPS 1400: *Atmosphere, Ocean, and Climate Change*, 21 students. Spring 2026
Course Director/Instructor; 36 lectures.

EPS 3220/5220: *Physics of Weather and Climate*, 12 students, 3 auditors. Fall 2025
Course Director/Instructor; 25 lectures.

EPS 6200: *Essentials of Earth and Planetary Sciences*, 11 students. Fall 2025
Co-instructor, 2 lectures.

EPS 140: *Atmosphere, Ocean, and Climate Change*, 16 students. Spring 2025
Course Director/Instructor; 36 lectures.

EPS 750: *Seminar on Planetary Atmospheric Dynamics*, 3 students. Fall 2024
Course Director; weekly 2-hour sessions.

EPS 620: *Essentials of Earth and Planetary Sciences*, 11 students. Fall 2024
Co-instructor, 2 lectures.

EPS 140: *Atmosphere, Ocean, and Climate Change*, 37 students. Spring 2023
Course Director/Instructor; 36 lectures.

EPS 750: *Seminar on Planetary Atmospheric Dynamics*, 2 students, Fall 2022
3 guest students. Course Director; weekly 2-hour sessions.

EPS 620: *Essentials of Earth and Planetary Sciences*, 25 students. Fall 2022
Co-instructor, 2 lectures.

EPS 322/522: *Physics of Weather and Climate*, 12 students. Spring 2022
Course Director/Instructor; 25 lectures.

EPS 756: *Seminar in Earth System Science*, 8 students. Spring 2022
Co-Instructor; weekly 2-hour sessions.

EPS 140: *Atmosphere, Ocean, and Climate Change*, 19 students. Spring 2021
Course Director/Instructor; 36 lectures.

EPS 756: *Seminar in Earth System Science*, 6 students, 10 guest students. Spring 2021
Co-Instructor; weekly 2-hour sessions.

EPS 750: *Seminar on Planetary Atmospheric Dynamics*, 5 students, Fall 2020
2 guest students. Course Director; weekly 2-hour sessions.

EPS 755: *Seminar in Earth System Science*, 10 students, 3 guest students. Fall 2020
Co-Instructor; weekly 2-hour sessions.

G&G 322/522: *Physics of Weather and Climate*, 13 students. Spring 2020
Course Director/Instructor; 25 lectures.

G&G 140: *Atmosphere, Ocean, and Climate Change*, 27 students. Fall 2019
Co-Director/Co-Instructor; 15 of 35 lectures.

Additional Teaching:
EPS 362/562: *Observing Earth from Space*, Yale (1 lecture/year) 2020–present
GLBL 7165: *Earth System Science for Public Policy*, Yale (1 lecture/year) 2023–present
Rossbypalooza Summer School, University of Chicago Summer 2022
Earth, Resources, Energy and the Environment, Yale (1 lecture) 2019
The Process of Change in Science: Discovery of Global Warming, USC (1 lecture) 2018
Oceans and Atmospheres, UCLA (several lectures) 2015, 2016
Blue Planet: Introduction to Oceanography, UCLA (1 lecture) 2016
The Universe and Humanity: Origin and Destiny, Honors, U. Arizona (4 lectures) 2012

Professional Service

Editor: *Icarus* 2018–2024

Referee:
Astrobiology, *Astrophysical Journal Letters*, *Bulletin of the American Meteorological Society*, *Climate Dynamics*, *Climate of the Past*, *CRC Press*, *Geophysical Research Letters*, *Icarus*, *IOP eBooks*, *Journal of the Atmospheric Sciences*, *Journal of Climate*, *Journal of Geophysical Research: Atmospheres*, *Journal of Hydrometeorology*, *Nature Astronomy*, *Na-*

ture Communications, *Nature Geoscience*, *npj Climate and Atmospheric Science*, *Oxford University Press*, *Planetary Science Journal*, *Planetary and Space Science*, *Proceedings of the National Academy of Sciences*, *Science Advances*, *Scientific Reports*

Proposal Reviewer:
Group Chief, Panelist, and External Reviewer for NASA Planetary Science Division
Reviewer for NSF Geosciences Directorate, Agence Nationale de la Recherche (French National Research Agency), Chilean National Research and Development Agency, Deutsche Forschungsgemeinschaft (German Research Foundation), UK Science and Technology Facilities Council, US–Israel Binational Science Foundation, CT Institute of Water Resources

Service to Societies and Agencies:

Member Representative for Yale University, University Corporation for Atmospheric Research (UCAR)	2019–present
Prize Subcommittee Member, AAS Division for Planetary Sciences	2024–2025
Steering Committee Member, NASA Network for Ocean Worlds	2020–2023
Invited panelist, National Academies Workshop: *Identifying New Community-Driven Science Themes for NSF's Support of Paleoclimate Research*	2021

Conference Activities and External Committees:

Primary/Session Convener, *Atmospheric Rivers: Processes, Impacts, Observations, and Uncertainties* Session, AGU Fall Meeting	2022–2025
Invited panelist, *Ice-Ocean Interactions on Icy Moons in the Solar System* Workshop, Princeton, NJ	2022
Outstanding Student Paper Award Judge, AGU Fall Meeting	2016
Co-chair, *Titan: Upper Atmosphere* Session, DPS/EPSC Joint Meeting	2016
Local Organizing Committee Member, *Exoplanets, Biosignatures and Instruments* Conference, Tucson, AZ	2013–2014
Curriculum Committee Member, Lunar and Planetary Laboratory	2011–2013
Co-chair, *Titan 3* Session, DPS Meeting	2013
Director Search Committee Member, Lunar and Planetary Laboratory	2011

University Service

University:

Steering Committee, Yale Hub for WCRP *My Climate Risk* Activity	2025–present
Heising-Simons 51 Peg b Fellowship Internal Review Committee	2019–present
Berkeley College Adviser	2019–2025
Yale College Postgraduate Fellowships Committee	2019–2021

Department:

Director of Undergraduate Studies	2025–present
Chair, Earth System Modeling Search Committee	2024–2025
Flint Postdoctoral Fellowship Committee	2024–2025
Ad Hoc Committee on Qualifying Exams	2024–2025
Planetary Science Search Committee	2023–2024
Climate Search Committee	2022–2023
YCNCC Cluster Search EPS Committee	2022
Program Review and Exam Committee	2019, 2021, 2022
Graduate Admissions and Recruiting Committee	2020–2021, 2022
Colloquium Committee	2019–2021
Computer Facilities & Users Committee	2019–2020
New Departmental Name Ad Hoc Committee	2020

Invited Colloquia and Seminars

SwRI Boulder Colloquium, Southwest Research Institute	2025
Seminar of the University Library, Université de Reims Champagne-Ardenne	2025

ClimaTea Seminar, Harvard University	2025
Department of Earth Sciences Seminar, University of Connecticut	2024
Department of Mathematics and Statistics Seminar, University of Exeter	2024
Earth System Science Interdisciplinary Center Seminar, University of Maryland	2024
Department of Physics Colloquium, Boise State University	2023
Geophysical Sciences Seminar, University of Chicago	2023
Atmosphere Ocean Science Colloquium, NYU Courant	2022
Rossbypalooza, University of Chicago	2022
Atmospheric Science Seminar, University of California, Davis	2022
Geological Sciences Department Seminar, University of Alaska, Anchorage	2022
Atmospheres and Oceans Seminar, Johns Hopkins University	2021
Earth and Atmospheric Sciences Colloquium, Indiana University, Bloomington	2021
Atmospheric Oceanic and Planetary Physics Seminar, University of Oxford	2021
DEEPS Colloquium, Brown University	2021
NASA Network for Ocean Worlds Lecture	2021
DEEPS Colloquium, Brown University	2020
Lamont-Doherty Earth Observatory Seminar, Columbia University	2020
Earth and Planetary Sciences Department Seminar, University of California, Davis	2020
Physical Oceanography Seminar, University of Rhode Island	2020
Paleoclimate Seminar, Woods Hole Oceanographic Institution	2020
Earth Section Seminar, Scripps Institution of Oceanography	2019
Origin and Evolution of Planet Earth Symposium, Yale University	2019
Departmental Seminar, Geological Sciences, Stanford University	2018
Earth/Planetary Science Special Seminar, California Institute of Technology	2018
Earth System Science Seminar, UC Irvine	2018
CLaSP Seminar, University of Michigan	2018
Department of Geology and Geophysics Colloquium, Yale University	2018
Department of Astronomy Colloquium, Cornell University	2018
Planetary Science Seminar, UCLA	2018
Whole Earth Seminar, Earth and Planetary Sciences, UCSC	2018
Atmospheric and Oceanic Sciences Department Seminar, UCLA	2017
Planetary Science Seminar, California Institute of Technology	2017
Atmospheric Oceanic and Planetary Physics Seminar, University of Oxford	2017
Physics Department Lecture, Westmont College	2016
Planetary Science Seminar, Jet Propulsion Laboratory	2016
Planetary Science Seminar, UCLA	2016
Laboratoire de Météorologie Dynamique Seminar, IPSL, Paris	2015
Planetary Seminar, Georgia Institute of Technology	2015
Planetary Science Seminar, UCLA	2014
Planetary Science Seminar, NASA Goddard Space Flight Center	2014

Invited Prize and Plenary Talks

Lora, J.M. (2025). "Recent insights into Titan's climate system from general circulation modeling." 20 Years Celebration of the Huygens Landing and the Cassini Mission's Success, Paris Observatory.

Lora, J.M. (2025). "Global variability and impacts of atmospheric rivers in a changing climate." 5th Climate, Weather and Water Forum.

Lora, J.M. (2023). "The influence of orbital forcing on the distribution of Titan's surface liquids." *NASA Early Career Award Talk*, 54th Lunar and Planetary Science Conference.

Lora, J.M. (2022). "Understanding Titan's weather, climate, and paleoclimate." *Urey Prize Lecture*, 54th Division for Planetary Sciences Annual Meeting.

Lora, J.M. (2018). "The circulation and volatile cycles of Solar System atmospheres." Comparative Climatology of Terrestrial Planets III.

Lora, J.M. (2018). "Atmospheric rivers and the changing climate of western North America since the Last Glacial Maximum." 2018 International Atmospheric Rivers Conference.

Lora, J.M. (2017). "The climate of Titan." Titan Through Time 4.

Selected Outreach Activities

Project Co-lead and Member, *DIYnamics* Outreach Program (*diynamics.github.io*)	2016–present
First Friday Astronomy Public Lecture, Boise State University	2023
Workshop Co-Convener, Earth Educators' Rendezvous, *"Teaching atmosphere, ocean, and planetary fluid dynamic fundamentals vividly with rotating tanks"*	2022
Lecturer, *"Weather across the Solar System"* Virtual Lecture, *Adventure in Science* Program	2021
Presenter, *Climate Change Professional Development Virtual Workshop* for middle and high school teachers, U. Mass. Lowell	2020, 2021
Panelist, *"Storms of the Solar System,"* NASA CCTP3 Livestream (∼20,000 views)	2018
Guest, *"Moons and Exoplanets: The same or different species?"*, *AAS Afternoon Astronomy Coffee Hangout* Podcast	2018
Featured Scientist, *Windfall Films* segment for TV Series on the Cosmos	2016

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