JUAN M. LORA

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Education

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

Appointments and Research Experience

Assistant Professor, Yale University 2019–present
Department of Earth and Planetary Sciences

Postdoctoral Fellow, University of California, Los Angeles 2014–2018
Chancellor's Fellow & California Alliance Fellow 2017–2018
NSF AGS Postdoctoral Research Fellow 2015–2017
Department of Earth, Planetary, and Space Sciences

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

Research Associate, NASA Academy, Goddard Space Flight Center 2008

Undergraduate Researcher, University of Southern California 2007–2009

Additional Training

Effectively Communicating Science: Expert Witness Training Academy, Mitchell Hamline School of Law, Saint Paul, MN 2019

Urbino Summer School in Paleoclimatology, Urbino, Italy 2016

GFDL Summer School on Atmospheric Modeling, Princeton, NJ 2012

Mission Involvement

NASA New Frontiers 4 mission *Dragonfly* 2017–present
(Co-I; E.P. Turtle, PI)

Grants and Fellowships

NASA Interdisciplinary Consortia for Astrobiology Research: 2020–2025
"Alternative Earths – how to build and sustain a detectable biosphere" (Co-I)

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

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

NASA Dragonfly Phase B (Co-I) 2019–2022

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

NASA Solar System Workings: "The role of moist convection in Titan's hydrologic cycle and general circulation" (PI) 2017–2021

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-I) 2016–2019

NSF AGS Postdoctoral Fellowship: "Impacts of large-scale dynamics on regional climate sensitivity: Model-paleodata comparisons in 2015–2017

three mid-latitude regions" (PI)

NASA Earth and Space Science Fellowship: "Modeling Titan's atmospheric dynamics and interaction with methane" 2012–2014

Honors and Awards

AGU Ronald Greeley Early Career Award	2020
NASA Planetary Science Early Career Fellowship (ECF)	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
USC Renaissance Scholar Award	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

Advising and Mentoring

Yale:
Postdoctoral Advisees: J. Michael Battalio, Seung Hun Baek
PhD/Major Discourse Advisees: Nicholas Lombardo
Minor Discourse Advisees: Guillaume Delaviel, Zhiyuan Li
PhD Committee Member for: Ulla Heede, Yu Liang, Manpreet Singh
Postgraduate Advisees: Sofia Menemenlis
Senior Thesis Advisees: Sofia Menemenlis (2020), Michael Machado (2019)
Undergraduate Research Advisees: Nicholas Archambault, Colin Baccioco, Kunsang Dorjee, Juliana Surprenant, Mary Yap

External:
PhD Committee Member for: Jan Vatant d'Ollone (PhD 2020, Sorbonne Université)
Research Advisees: Sean Faulk (PhD 2018, UCLA; principally advised by J.L. Mitchell), Hung-I Lee (PhD 2019, UCLA; principally advised by J.L. Mitchell and A. Tripati), Chloe Whicker (BS 2019, UCLA), Raul Reyes (UCLA), Shelley Cheng (UCLA)

Teaching

Yale Courses:

EPS 750, Seminar on Planetary Atmospheric Dynamics	Fall 2020
EPS 755, Seminar in Earth System Science (P. Hull, lead instructor)	Fall 2020
G&G 322, Physics of Weather and Climate	Spring 2020
G&G 140, The Atmosphere, the Ocean, and Climate Change	Fall 2019

Guest Lecturer: Yale, "Observing Earth from Space" (1 lecture, 2020) and "Earth, Resources, Energy and the Environment" (1 lecture, 2019); U. Southern California, "The Process of Change in Science: Discovery of Global Warming" (1 lecture, 2018); UCLA, "Oceans and Atmospheres" (several lectures, 2015–2016) and "Blue Planet: Introduction to Oceanography" (1 lecture, 2016); U. Arizona,"The Universe and Humanity: Origin and Destiny, Honors" (4 lectures, 2012)

Professional Service

Editor: *Icarus* (2018–present)

Referee: *Astrophysical Journal Letters*, *Climate Dynamics*, *Geophysical Research Letters*, *Icarus*, *Journal of Geophysical Research: Atmospheres*, *Journal of Hydrometeorology*, *Nature Astronomy*, *Nature Communications*, *Nature Geoscience*, *Planetary Science Journal*, *Planetary and Space Science*, *Scientific Reports*

Proposal Reviewer: Group Chief, Panelist, and External Reviewer for NASA Planetary Science Division; Reviewer for NSF Geosciences Directorate; Reviewer for UK Science and Technology Facilities Council

Member Representative for Yale University, University Corporation for Atmospheric Research (UCAR) (2019–present)

Committee Member: Local Organizing Committee, *Exoplanets, Biosignatures and Instruments* Conference, Tucson, AZ (2013–2014); Curriculum Committee, Lunar and Planetary Laboratory (2011–2013); Director Search Committee, Lunar and Planetary Laboratory (2011)

Conference Activities: Outstanding Student Paper Award Judge, AGU Fall Meeting (2016); Co-chair for *Titan: Upper Atmosphere* Session, Joint DPS/EPSC Meeting (2016); Co-chair for *Titan 3* Session, DPS Meeting (2013)

University Service

University: Yale College Postgraduate Fellowships Committee (2019–2021)

Department: Committees: Colloquium (2019–2021); Program Review and Exam (2019–2021); Graduate Admissions and Recruiting (2020–2021); Computer Facilities & Users (2019–2020); Rollout of New Departmental Name Ad Hoc (2020)

College Adviser, Berkeley College (2019–present)

Outreach

Project Co-lead: *DIYnamics* Outreach Program (*diynamics.github.io*; 2016–present)

Presenter: *Climate Change Professional Development Workshop* for middle and high school teachers, U. Mass. Lowell (2020)

Guest/Panelist: NASA CCTP3 Livestream (∼20,000 views), *"Storms of the Solar System"* (2018); AAS Afternoon Astronomy Coffee Hangout, *"Moons and Exoplanets: The same or different species?"* (2018); *Windfall Films* segment for TV Series on the Cosmos (2016)

Volunteer and Exhibitor: *Exploring Your Universe*, UCLA (2014–2017); UCLA and Santa Monica College paleoclimate research workshops (2015–2016); UCLA iPLEX K-12 classroom visits and workshops (2014–2016); DPS/EPSC Meeting Art Shows (2010–2012, 2016); LPL Art of Planetary Science (2013–2015); Telescope Nights, University of Arizona (2010–2012)

Committee Member: Organizing Committee, *Exploring Your Universe*, UCLA (2015)

Invited Colloquia and Seminars (Last 5 Years)

DEEPS Colloquium, Brown University	2020
Lamont-Doherty Earth Observatory Seminar, Columbia University	2020
Earth and Planetary Sciences Department Seminar, UC 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 Seminar, 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
AOPP Seminar, University of Oxford	2017
Physics Department Lecture, Westmont College	2016
Planetary Science Seminar, Jet Propulsion Laboratory	2016

Planetary Science Seminar, UCLA 2016

Invited Conference Talks

Lora, J.M., D.E. Ibarra, C.B. Skinner (2020). "Components and Mechanisms of the North American hydrologic cycle since the Last Glacial Maximum." American Geophysical Union Fall Meeting.

Lora, J.M., C.B. Skinner (2020). "Atmospheric river shifts in response to Holocene forcings and their impact on millennial-scale hydroclimate changes." American Geophysical Union Fall Meeting.

Lora, J.M. (2018). "The circulation and volatile cycles of Solar System atmospheres" (Invited Review). Comparative Climatology of Terrestrial Planets III, abstract #2030.

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., J.L. Mitchell, C. Risi, and A.E. Tripati (2017). "North Pacific atmospheric rivers and their influence on North America since the Last Glacial Maximum." American Geophysical Union Fall Meeting, abstract #PP44C-06.

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

Lora, J.M., J.L. Mitchell, C. Risi, and A.E. Tripati (2016). "Atmospheric moisture transport to western North America during the Last Glacial Maximum and deglaciation." Geological Society of America Annual Meeting, abstract #288614.

Refereed Publications

1. **Lora, J.M.**, C.A. Shields, 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
2. 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
3. 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
4. O'Brien, T.A., and 29 co-authors (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
5. Dixit, Y., S. Toucanne, C. Fontanier, V. Pasquier, **J.M. Lora**, G. Jouet, 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
6. 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
7. 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*
8. 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

9. **Lora, J.M.** and D.E. Ibarra (2019). The North American hydrologic cycle through the last deglaciation. *Quaternary Science Reviews* 226, 105991. https://doi.org/10.1016/j.quascirev.2019.105991 (Invited contribution)
10. Lee, H.-I., J.L. Mitchell, A. Tripati, **J.M. Lora**, G. Chen, 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
11. **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
12. 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
13. 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
14. 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
15. **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
16. 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
17. 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
18. **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
19. 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
20. 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
21. **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
22. **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

23. **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

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

25. 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

26. 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

27. **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

28. **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

29. **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

30. 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

31. **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

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