

Jonathan L. Mitchell

Earth, Planetary & Space Sciences, Atmospheric & Oceanic Sciences

University of California, Los Angeles
595 Charles Young Drive East,
Box 951567
Los Angeles, CA 90095-1567
<http://www2.ess.ucla.edu/~mitch>
jonmitch@ucla.edu

Education:

- 2007 Ph.D., Astronomy and Astrophysics, The University of Chicago
“The Climate Dynamics of Titan”
- 2002 M.S., Astronomy and Astrophysics, The University of Chicago
“Cosmological constraints from gravitational lens statistics”
- 2000 B.S. Summa Cum Laude, Physics, Westmont College, Santa Barbara, CA

Honors and Awards:

- 2013 Ronald Greeley Award, American Geophysical Union
- 2012-2013 Hellman Fellows Award, University of California
- 2011-2012 Faculty Career Development Award, UCLA
- 2007-2009 W. M. Keck Foundation Fellow, Institute for Advanced Study, Princeton

Employment:

- 2013 Member, Institute for Advanced Study, Princeton
- 2009- Assistant Prof., Earth & Space Sciences; Atmospheric Sciences, UCLA
- 2009-2012 Fellow, Institute for Geophysics & Planetary Physics, UCLA
- 2007-2009 Member, Institute for Advanced Study, Princeton
- 2003-2007 RA, Climate Systems Center, University of Chicago
- 2002-2003 RA, Kavli Institute for Cosmological Physics, University of Chicago
- 2001-2002 Graduate Fellow, Adler Planetarium, Chicago, IL
- 2000-2001 Policy RA, RAND Corporation, Arlington, VA
- 1999-2000 RA, CMB cosmology, University of California at Santa Barbara

Teaching Experience:

- 2013- AOS3, Intro. to the Atmospheric Environment, UCLA
- 2011- AOS200A, Intro. to Atmospheric & Oceanic Fluids, UCLA
- 2011- ESS200B, Oceans & Atmospheres, UCLA
- 2010- ESS229, Planetary Atmospheres, UCLA
- 2010- AOS101, Atmospheric Thermodynamics & Dynamics, UCLA

Research Group:

- Peng Wang – Postdoc, ESS, Global linear instabilities in planetary atmospheres
- Matthew Walker – 3rd year graduate student, EPSS, Viscoelastic ice shells of synchronous moons
- Tersi Arias – 3rd year graduate student, AOS, Cassini observations of Titan’s methane clouds

Sean Faulk – 2nd year graduate student, ESS, Planetary albedo and the limits of habitability
Joao Rafael dias Pinto – visiting grad student (2012-2013), Atmospheric superrotation

Former group members:

Kunio Sayanagi – Postdoc, ESS (2010-2011), now Assistant Professor at Hampton University
Jeff Portwood – Undergrad, ESS (2011-2012), Climate hysteresis on Titan
Sander van Oers – Visiting grad student (2012), Folding instabilities of planetary lithospheres

Service & Outreach:

2013 Interview for “Most Extreme Space Weather”, Weather Channel
2013 Institute for Planets and Exoplanets steering committee, UCLA
2011 Exploring Your Universe outreach day, UCLA
2011 Volunteer, Science Explosion Friday, Lanai Road Elementary School, LA
2009- Admissions, Computing, Search, and Advising Committees, ESS and AOS
Departments, UCLA
2010 Organizer, IPAM program, Equation Hierarchies for Understanding Climate
2009, 2012 NASA review panels, Washington, DC
2009- Reviewer for NASA Outer Planets, Planetary Atmospheres, and Origins
2006- Referee for Nature, Nature Geoscience, Astrophysical Journal, Icarus, JGR,
Journal of Atmospheric Sciences
2006 Local organizing committee, Pale Blue Dot III, Adler Planetarium Chicago

Invited talks: Caltech, Harvard, Princeton, Berkeley, Yale, UCSC, Northwestern, AMS, AGU

Publications:

(reprints available at <http://www2.ess.ucla.edu/~mitch/Publications.html>)

Mitchell, J.L., Vallis, G.K., and Potter, S.F. “Seasonal cycles and superrotation in a dry GCM” , in prep.

Dias Pinto, J.R. and Mitchell, J.L. “Atmospheric superrotation in an idealized GCM: parameter dependence of the eddy response” in prep.

Wang, P. and Mitchell, J.L. “Linear ageostrophic instability in idealized atmospheric flows, and the transition to superrotation” in prep.

Potter, S.F., Vallis, G.K. and Mitchell, J.L. “Spontaneous superrotation and the role of Kelvin wave-like variability in an idealized dry GCM” *Journal of Atmospheric Sciences* (2013, under revision).

Schubert, G. and Mitchell, J.L. “Planetary Atmospheres as Heat Engines” to appear in *Comparative Climatology on Terrestrial Planets*, Arizona Press (2013).

Griffith, C.A., Mitchell, J.L., Lavvas, P. and Tobie, G. “Titan’s Evolving Climate” to appear in *Comparative Climatology on Terrestrial Planets*, Arizona Press (2013).

Eagle, R.A., Risi, C., Mitchell, J.L., Eiler, J.M., Seibt, U., Neelin, J.D., Li, G., and Tripathi, A.K. “High regional climate sensitivity over continental China inferred from glacial-recent changes in temperature and the hydrologic cycle” *PNAS* 110:22, 8813 (2013).

Tripathi, A.K., Salany, S., Pittmann, D., Eagle, R.A., Neelin, J.D., Eiler, J.M., Mitchell, J.L., & Beaufort, L. “Enhanced Tropical Warming and Entrainment Explain Glacial to Recent Changes in Snowlines and Tropospheric Structure over the West Pacific Warm Pool” *Nature Geoscience* (2013, under revision).

Hayes, A.G., Lorenz, R.D., Donelan, M.A., Schneider, T., Lamb, M.P., Fischer, W.W., Mitchell, J.L., Manga, M., Lunine, J.I., Graves, S.D., Tolman, H.L., Encrenaz, P., Aharonson, O. and the Cassini RADAR Team “Wind driven capillary-gravity waves on Titan's Lakes: Hard to Detect or Non-Existent?” *Icarus*, 225, 403 (2013).

Mitchell, J.L. “Titan's transport-driven methane cycle” *Astrophysical Journal Letters*, 756, L26 (2012).

Lorenz, R.D., Newman, C.E., Tokano, T., Mitchell, J.L., Charnay, B., Lebonnois, S., and Achterberg, R. “Formulation of a Wind Specification for Titan Late Polar Summer Exploration” *Planetary and Space Science*, 70, 73-83 (2012).

Mitchell, J.L., Ádámkóvics, M., Caballero, R. & Turtle, E. “Locally enhanced precipitation organized by planetary-scale waves on Titan”, *Nature Geoscience*, 4, 589-592, doi:10.1038/ngeo1219 (2011).

Barnes, J.W., Lemke, L., Foch, R., McKay, C.P., Beyer, R.A., Radebaugh, J., Atkinson, D.H., Lorenz, R.D., Le Meuélíc, S., Rodríguez, S., Gundlach, J., Giannini, F., Bain, S., Flasar, F.M., Hurford, T., Anderson, C.M., Merrison, J., Ádámkóvics, M., Kattenhorn, S.A., Mitchell, J.L., Burr, D.M., Colaprete, A., Schaller, E., Friedson, A.J., Edgett, K.S., Coradini, A., Adriani, A., Sayanagi, K.M., Malaska, M.J., Morabito, D., Rey, K. “AVIATR – Aerial Vehicle for In-Situ and Airborne Titan Reconnaissance”, *Experimental Astronomy* 33:55-127 (2012).

Mitchell, J.L. & Vallis, G.K. “The transition to superrotation in terrestrial atmospheres”, *J. Geophys. Res.* 115:E12008, doi:10.1029/2010JE003587 (2010).

Goldreich, P.M. & Mitchell, J.L. “Elastic ice shells of synchronous moons: Implications for cracks on Europa and non-synchronous rotation of Titan”, *Icarus* 209:631-638 (2010).

Youdin, A. & Mitchell, J. L. “The Mechanical Greenhouse: Burial of heat by turbulence in hot Jupiter atmospheres”, *ApJ* 721:1112-1126 (2010).

Spiegel, D.S., Raymond, S.N., Dressing, C.D., Scharf, C.A., Mitchell, J.L. “Generalized Milankovitch Cycles and Longterm Climatic Habitability”, *ApJ* 721:1308-1318 (2010).

Mitchell, J. L., Pierrehumbert, R. T., Frierson, D. M. W., Caballero, R. “The impact of methane thermodynamics on seasonal convection and circulation in a model Titan atmosphere”, *Icarus* 203:250-264 (2009).

Mitchell, J. L. “Coupling convectively driven atmospheric circulation to surface rotation: Evidence for active methane weather in the observed spin rate drift of Titan” *Astrophysical Journal* 692:168-173 (2009).

Mitchell, J. L. “The drying of Titan’s dunes: Titan’s methane hydrology and its impact on atmospheric circulation” *J. Geophys. Res.*, 113, E08015, doi:10.1029/2007JE003017 (2008).

Mitchell, J. L., Pierrehumbert, R. T., Frierson, D. M. W., Caballero, R. “The Dynamics Behind Titan’s Methane Clouds” *PNAS* vol. 103, no. 49, pp. 18421-18426 (2006).

Caballero, R., Pierrehumbert, R. T., Mitchell, J. L. “Axisymmetric, nearly inviscid circulations in non-condensing radiative-convective atmospheres”, *Quarterly Journal of the Royal Meteorological Society*, 134:1269-1285 (2008).

Mitchell, J. L., Keeton, C. R., Frieman, J. A., Sheth, R. K. “Improved Cosmological Constraints from Gravitational Lens Statistics” *ApJ* 622:81-98 (2005).

Rogers, W. F., Georgiev, G., Neyens, G., Borremans, D., Coulier, N., Coussement, R., Davies, A. D., Mitchell, J. L., Teughels, S., Brown, B. A., Mantica, P. F. “Ground-state magnetic moment of the T=1 nucleus ^{32}Cl using on-line beta-NMR spectroscopy” *Phys. Rev. C.* 62:044312 (2000).

Silberglitt, R. S. and Mitchell, J. L. “Industrial Materials for the Futures (IMF) R&D Priorities” DB-364-NREL RAND (2001).

Perry, W., Button, R. W., Bracken, J., Sullivan, T., Mitchell, J. L. “Measures of Effectiveness for the Information-Age Navy” RAND (2001).