

## **Brian Jackson - Curriculum Vitae**

### **Home Address**

9911 Grayson Ave  
Silver Spring MD 20901

### **Work Address**

Carnegie Dept. of Terrestrial Magnetism  
5241 Broad Branch Road, NW  
Washington, D.C. 20015-1305

**Voice:** (770) 366-4909

**E-mail:** bjackson@dtm.ciw.edu

**WWW:** <http://www.lpl.arizona.edu/~bjackson/>

### **Position and Affiliation**

2011 September – Present: Carnegie DTM Astronomy Post-Doctoral Fellow –  
Carnegie Institution of Washington, Washington D.C.

### **Degrees**

2009 May: Univ. of Arizona, Ph.D., Planetary Sciences  
Dissertation Title: “Tidal Evolution of Extra-Solar Planets.”

2004 May: Georgia Institute of Technology, B.S. Summa cum Laude, Physics

### **Research Experience**

2011 September – Present: Carnegie DTM Astronomy Fellow  
Advisor: Dr John Chambers – Carnegie DTM  
Planetary Ellipsoidal Variations as Observed by the Kepler Mission

2009 May – 2011 August: NASA Postdoctoral Program Fellow  
Advisor: Prof. Drake Deming – Univ. of Maryland Astronomy  
Close-in Exoplanets: Tides, Atmospheric Escape, and Transit Characterization

2008 May – 2009 May: NASA Earth and Space Sciences Graduate Fellow (NESSF)

2006 May – 2008 January: Graduate Research Assistant  
Advisor: Prof. Richard Greenberg – Univ. of Arizona, Lunar Planetary Laboratory (LPL)  
Tidal, Secular and Resonant Interactions in Extra-Solar Systems

2004 August – 2006 January: Graduate Research Assistant  
Advisor: Prof. Caitlin Griffith – Univ. of Arizona, LPL  
Radiative Transfer Analysis (RTA) of Cassini Near-IR Observations of Saturn’s Moon  
Titan

2004 June – August: GA Space Grant Fellow

2003 June – August: Caltech Summer Undergraduate Research Fellow (SURF)  
Advisor: Dr. Glenn Orton – Jet Propulsion Laboratory (JPL)  
RTA of Ground-Based Near-IR Observations of Titan

## Refereed Journal Articles

- Sada, P. V., Deming, D., Jennings, D. E., **Jackson, B.**, Hamilton, C. M. Fraine, J., Peterson, S. W., Haase, F., Bays, K., Lunsford, A., O'Gorman, E. (2012) Extrasolar Planet Transits Observed at Kitt Peak National Observatory, *accepted to Publications of the Astronomical Society of the Pacific*.
- Penev, K., **Jackson, B.**, Spada, F., Thom, N., & Barnes, R. (2011) Constraining Tidal Dissipation in Stars from the Destruction Rates of Exoplanets, *submitted to Astrophysical Journal*.
- Jackson, B.**, Lewis, N., Barnes, J. W., Deming, D., Showman, A., & Fortney, J. (2011) The EVIL-MC Model for Ellipsoidal Variations of Planet-Hosting Stars and Applications to the HAT-P-7 System, *submitted to Astrophysical Journal*.
- Lorenz, R., **Jackson, B.**, Barnes, J., Spitale, J., Radebaugh, J., & Baines, K. (2011) Meteorological Conditions at Racetrack Playa, Death Valley National Park: Implications for Rock Production and Transport. *Journal of Applied Meteorology and Climatology* 50, 2361.
- Deming, D., Sada, P., **Jackson, B.**, Peterson, S., Agol, E., Knutson, H., Jennings, D., Haase, F., & Bays, K. (2011) Kepler and Ground-based Transits of the Exo-Neptune HAT-P-11b. *Astrophysical Journal* 740, 33.
- Lorenz, R., **Jackson, B.**, Barnes, J. W., Spitale, J., & Keller, J. (2011) Ice Rafts not Sails: Floating the Rocks at Racetrack Playa. *American Journal of Physics* 79, 37.
- Barnes, R., Raymond, S., Greenberg, R., **Jackson, B.**, & Kaib, N. (2010) CoRoT-7b: Super-Earth or Super-Io? *Astrophysical Journal* 709, 95.
- Debes, J. & **Jackson, B.** (2010) Too Little, Too Late: How the Tidal Evolution of Hot Jupiters affects Transit Surveys of Clusters. *Astrophysical Journal* 723, 1703.
- Jackson, B.**, Miller, N., Barnes, R., Fortney, J., Raymond, S., & Greenberg, R. The Roles of Tidal Evolution and Evaporative Mass Loss in the Origin of CoRoT-7 b. (2010) *Monthly Notices Royal Astronomy Society* 407, 910.
- Lorenz, R., **Jackson, B.**, & Barnes, J. (2010) Inexpensive Timelapse Digital Cameras for Studying Transient Meteorological Phenomena: Dust Devils and Playa Flooding. *Journal of Atmospheric and Oceanic Technology* 27, 246.
- Lorenz, R., **Jackson, B.**, & Hayes, A., (2010) Racetrack and Bonnie Claire: Southwestern US Playa Lakes as Analogs for Ontario Lacus, Titan. *Planetary and Space Science* 58, 724.
- Sada, P., Deming, D., **Jackson, B.**, Jennings, D., Peterson, S., Haase, F., Bays, K., O'Gorman, E., & Lundsford, A. (2010) Recent Transits of the Super-Earth Exoplanet GJ 1214b. *Astrophysical Journal* 720, 215.

- Barnes, J. W., Brown, R., Soderblom, J., Soderblom, L., Jaumann, R., **Jackson, B.**, le Mouelic, S., Sotin, C., Buratti, B., Pitman, K., Baines, K., Clark, R., & Nicholson, P. (2009) Shoreline Features of Titan's Ontario Lacus from Cassini/VIMS Observations. *Icarus* 201, 217.
- Barnes, R., **Jackson, B.**, Greenberg, R., & Raymond, S. (2009b) Tidal Limits to Planetary Habitability. *Astrophysical Journal Letters* 770, L30.
- Barnes, R., **Jackson, B.**, Raymond, S., West, A., & Greenberg, R. (2009a) The HD 40307 Planetary System: Super-Earths or Mini-Neptunes? *Astrophysical Journal* 695, 1006.
- Heller, R., **Jackson, B.**, Barnes, R., Greenberg, R., & Homeier, D., (2009) Tidal Effects on Brown Dwarfs: Application to the Eclipsing Binary 2MASS J05352184-0546085. *Astronomy & Astrophysics* 514, 22.
- Jackson, B.**, Barnes, R., & Greenberg, R. (2009) Observational Evidence for Tidal Destruction of Exoplanets. *Astrophysical Journal* 698, 1357.
- Miller, N., Fortney, J., & **Jackson, B.** (2009) Inflating and Deflating Hot Jupiters: Coupled Tidal and Thermal Evolution of Known Transiting Planets. *Astrophysical Journal* 702, 1413.
- Barnes, R., Raymond, S., **Jackson, B.**, & Greenberg, R. (2008) Tides and the Evolution of Planetary Habitability. *Astrobiology* 8, 557.
- Jackson, B.**, Barnes, R., & Greenberg, R. (2008c) Tidal Heating of Extra-Solar Terrestrial Planets and Implications for their Habitability. *Monthly Notices of the Royal Astronomical Society* 391, 237.
- Jackson, B.**, Greenberg, R., & Barnes, R. (2008b) Tidal Heating of Extra-Solar Planets. *Astrophysical Journal* 681, 1631.
- Jackson, B.**, Greenberg, R., & Barnes, R. (2008a) Tidal Evolution of Close-in Extra-Solar Planets. *Astrophysical Journal* 678, 1396.
- Dunn, J., Crenshaw, M., & **Jackson, B.** (2006) An Internet Database of Ultraviolet Continuum Light Curves for Seyfert Galaxies. *Publications of the Astronomical Society of the Pacific* 118, 572.
- Orton, G., Fischer, B., Ressler, M., & **Jackson, B.** (2004) Exploring the 18-20 Micron Window in Titan's Atmosphere: Rotational and Time Variability. *Geophysical Research Abstracts*, 6, 04044.

### **Book Chapters**

- Jackson, B.**, Barnes, R., & Greenberg, R. (2010) "Tides and Exoplanets." in Formation and Evolution of Exoplanets, ed. R. Barnes. Wiley-VCH, Weinheim.

## Conference Abstracts

- 2011 December: American Geophysical Union Annual Meeting, San Francisco, CA. "Modeling Cooling Rates of Martian Flood Basalt Columns."
- 2011 October: Division of Planetary Sciences Meeting, Nantes, France. "The Effects of Tidal Distortion on Transit Lightcurves."
- 2011 September: Extreme Solar Systems II, Jackson Hole, WY. "The Effects of Tidal Distortion on Transit Lightcurves."
- 2011 June: Heraeus Seminar, Physikzentrum Bad Honnef, Germany. "Observations of Gas-Giant Exoplanet Atmospheres." (invited)
- 2011 January: American Astronomical Society Meeting 217, Seattle WA. "Constraining Tidal Dissipation in Stars and Destruction Rates of Exoplanets."
- 2010 July: National Capital Area Disks Workshop III, NASA/GSFC, Greenbelt MD. "How the Tidal Evolution of the Orbits of Hot Jupiters Affect Transit Surveys of Clusters."
- 2010 October: Division of Planetary Sciences Meeting 42, Pasadena CA. "Hermean atmospheres of rocky exoplanets."
- 2010 September: Cool Stars Conference 16, Seattle WA. "Effects of Tidal Evolution of Hot Jupiters on Transit Surveys." & "Evaporated/ing Cores of Gas Giants." (invited)
- 2010 September: Exoclimates Conference, Univ. of Exeter, UK. "Hermean atmospheres of rocky exoplanets."
- 2010 January: American Astronomical Society Meeting 215, Washington D.C. "Is CoRoT-7 b the Remnant Core of an Evaporated Gas Giant?"
- 2009 September: Division of Planetary Sciences Meeting 41, Fajardo, Puerto Rico. "Effects of Secular, Resonant and Tidal Perturbations on Planetary Habitability."
- 2009 May: International Astronomical Union Symposium 253, Boston MA. "Planetary Transits and Tidal Evolution."
- 2009 January: American Astronomical Society Meeting 214, Long Beach CA. "The Effects of Tides on Close-In Exoplanets."
- 2008 September: Division of Planetary Sciences Meeting 40, Ithaca NY. "Tidal Heating of Extrasolar Terrestrial-scale Planets and Constraints on Habitability."
- 2007 December: American Astronomical Society Meeting 211, Austin TX. "Tidal Evolution of Close-in Extra-Solar Planets."

2007 July: Division of Dynamical Astronomy Meeting 38, Ann Arbor MI. “Tidal Evolution of Close-in Extra-Solar Planets.”

### **Seminars and Colloquia**

2012 Mar 1: Astronomy Dept. Colloquium @ Vanderbilt University, Nashville TN –  
Host: Dr. Joshua Pepper

2012 Feb 8: Physics Dept. Colloquium @ Lehigh University, Bethlehem PA –  
Host: Prof. George McCluskey

2011 Nov 3: Astronomy Dept. Colloquium @ Univ. of Virginia, Charlottesville VA – Host:  
Prof. Phil Arras

2011 May 12: Physics and Astronomy Dept. Colloquium @ Georgia State Univ., Atlanta GA  
– Host: Prof. Michael Crenshaw

2010 May 7: Physics Dept. Colloquium @ Univ. of Idaho, Moscow ID –  
Host: Prof. Jason Barnes

2010 Mar 21: Science and Exploration Director's Science Seminar @ NASA/GSFC,  
Greenbelt MD – Host: Joseph Nuth

2010 Mar 17: Wednesday Lunch Talk (Wunch) @ Princeton Astrophysics Dept., Princeton NJ  
– Hosts: Tim Brandt and Adam Burrows

2010 Feb 23: Institute for Theoretical Computation Lunch Talk @ Harvard CfA, Boston MA  
– Host: Darin Ragozzine

2010 Feb 19: Special Planetary Science Seminar @ MIT Earth, Atmospheric, and Planetary  
Sciences Dept., Boston MA – Host: Sara Seager

2010 Feb 2: Kleigel Planetary Science Seminar @ Caltech Geological and Planetary Sciences  
Dept., Pasadena CA – Host: Michael Brown

2010 Jan 13: Science Brown-Bag Seminar @ NASA Headquarters, Washington, D.C. –  
Host: Joe Bredekamp

2009 Nov 19: Physics and Astronomy Dept. Colloquium @ Franklin and Marshall College,  
Lancaster PA - Host: Delphine Perrodin

2009 Oct 29: Physics and Astronomy Dept. Colloquium @ State Univ. of New York Stony  
Brook, Stony Brook NY - Host: Deane Peterson

2009 Oct 27: Astronomy and Astrophysics Dept. Pizza Lunch Seminar @ Columbia Univ.,  
New York NY - Host: Kristen Menou

2009 Sep 17: Exoplanets Group Talk @ Goddard Space Flight Center, Greenbelt MD –  
Host: Marc Kuchner

2009 Jul 21: Astronomy Dept. Colloquium @ Univ. of Washington, Seattle WA –  
Host: Rory Barnes

2009 Jun 5: Astronomy Dept. Colloquium @ Univ. of California Santa Cruz, Santa Cruz CA -  
Host: Jonathan Fortney

### **Teaching Experience**

2011 June 26 – July 1: Planned and led NASA Lunar and Planetary Science Academy (LPSA) interns in field work on Columbia River Flood Basalt (CRFB) in WA/ID

2011 May – August: Mentored two LPSA interns – undergrad David Weiss (College of Charleston/Geosciences) analyzed CRFB field data and images of Martian basalt columns taken by HiRISE instrument; grad Nicole Thom (Univ. of ND/Space Sciences) is developing a model for tidal evolution and mass loss for her master's thesis

2010 June 22-26: Led LPSA interns on field trip to Death Valley (DV) National Park and survey of Racetrack Playa

2010 May – August: Mentored undergrad Kynan Rilee (Princeton/Computer Sciences) in development of image analysis software to analyze photos of Racetrack Playa

2010 January – May: Taught survey course of the solar system for non-science major upperclassmen (ASTR 330) @ Dept. of Astronomy, Univ. of MD; Course syllabus below

2008 January – May: Grad. Teaching Assistant for a solar system survey course for non-science major underclassmen (PTYS 206) @ LPL - Instructor: Prof. Roger Yelle

2006 January – May: Grad. Teaching Assistant for a solar system survey course for non-science major underclassmen (PTYS 206) @ LPL - Instructor: Prof. William Hubbard

2004 January – May: Undergrad. Teaching Assistant for Differential Equations (MATH 2403) @ Georgia Tech, led discussion and homework sessions

2003 August – December: Undergrad. Teaching Assistant for Calculus I (MATH 1501) @ Georgia Tech, led discussion and homework sessions

### **Public Outreach and Education**

Judge for Montgomery County MD Science Fair – 2012 Mar 17

Astronomy partner with Towson Univ.'s Project ASTRO and Yorktown Elementary School in Baltimore MD – 2011-2012 school year

Invited talk at National Capital Astronomers monthly meeting – “From Extrasolar Gas Giant to Hot, Rocky Planet” – 2011 February 1

Invited talk at Northern Virginia Astronomy Club’s Astronomy Day – “Distant Worlds: An Introduction to Extrasolar Planets” – 2010 April 24

Astronomy partner with Univ. of Arizona’s Project ASTRO at Sunrise Drive Elementary School in Tucson AZ – 2005-2006 school year

Contributor to “Astronomy” Magazine’s “Ask Astro” – Sept. 2010, Nov. 2010, and Jun. 2011

### **Press and Popular Articles**

NASA feature article, 2012 February 16 “Honeycombs’ and Hexacopters Help Tell Story of Mars” by Elizabeth Zubritsky – <http://www.nasa.gov/topics/solarsystem/features/mars-honeycomb.html>

NASA feature article, 2010 August 11 “The Mysterious Roving Rocks of Racetrack Playa” by Elizabeth Zubritsky – <http://www.nasa.gov/topics/earth/features/roving-rocks.html>

NASA feature article, 2010 September 9 “Deadly Tides Mean Early Exit for Hot Jupiters” by Elizabeth Zubritsky – <http://www.nasa.gov/topics/universe/features/early-exit.html>

BBC news article, 2010 January 7 “Super-Earth ‘began as gas giant’” – <http://news.bbc.co.uk/2/hi/science/nature/8446125.stm>

Science Daily article, 2009 April 27 “Missing Planets Attest To Destructive Power Of Stars’ Tides” – <http://www.sciencedaily.com/releases/2009/04/090427193242.htm>

Univ. of Arizona press release, 2008 October 12 “Tides Have Major Impact on Planet Habitability” – <http://uanews.org/node/21820>

Astrobiology Magazine podcast, 2009 January 12 “Talking About Tides” by Simon Mitton – <http://www.astrobio.net/pressrelease/3000/talking-about-tides>

### **Miscellaneous**

Won Geological Society of America (GSA) Research Grant to cover field work in Racetrack Playa in DV

Served as ad-hoc scientific manuscript reviewer for “Astrophysical Journal”, Dr. Steve Kawaler, ed. and “Astronomy and Astrophysics”, Dr. Thierry Forveille, ed.

Served on review panels for NASA’s Origins of Solar Systems and Outer Planets Research