

# Peter B. James | curriculum vitae

*Aim for the heavens, and you will get Earth thrown in.*

— C.S. Lewis

## PERSONAL DETAILS

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## EDUCATION

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**Ph.D. in Planetary Science** 2007-2013  
*Massachusetts Institute of Technology (MIT)*  
Advisors: Prof. Maria Zuber and Prof. Bradford Hager  
Dissertation Title: Geophysical Insights into the Histories of Venus, Mercury and the Moon

**Sc.B. in Geology/Physics–Mathematics** 2003-2007  
*Brown University*  
Advisor: Prof. E. Marc Parmentier  
Honors Thesis Title: Plate Flexure and Initiation of Subduction

**A.B. in Physics** 2003-2007  
*Brown University*

## PROFESSIONAL EXPERIENCE

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**Assistant Professor** anticipated Aug 2017  
*Department of Geosciences, Baylor University*

**Urey Fellow** Aug 2016 - present  
*Lunar & Planetary Institute*

**Post-doctoral Research Scientist** Nov 2013 - Aug 2016  
*Lamont-Doherty Earth Observatory, Columbia University*

**Science Team Participant** Sept 2011 - Apr 2016  
*Mercury Surface, Space Environment, Geochemistry, and Ranging mission (MESSENGER)*  
Worked with team engineers to develop a map of crustal thickness; performed spatio-spectral analyses

**Science Team Participant** Sept 2010 - present  
*Gravity Recovery and Interior Laboratory (GRAIL)*  
Performed spatio-spectral analyses with spherical harmonic gravity solutions

**Science Team Participant** Sept 2008 - present  
*Lunar Orbiter Laser Altimeter (LOLA)*  
Worked to remove errant detections from the raw data

## PEER-REVIEWED PUBLICATIONS

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1. James, P., Kendall, J., Zuber, M., Melosh, J., Solomon, S. (2016). Deep structure of the lunar South Pole–Aitken basin. *Journal of Geophysical Research, Planets*, (in prep)
2. Byrne, P., Klimczak, C., McGovern, P., Mazarico, E., James, P., Neumann, G., Zuber, M., Solomon, S. (2015). Deep-seated reverse faults bound the Mare Crisium mascon. *Earth and Planetary Science Letters*, 427:183–190
3. Johnson, C., Phillips, R., Purucker, M., Anderson, B., Byrne, P., Denevi, B., Feinberg, J., Hauck, S., Head, J., Korth, H., James, P., Mazarico, E., Neumann, G., Philpott, L., Siegler, M., Tsyganenko, N., and Solomon, S. (2015). Low-altitude magnetic field measurements by MESSENGER reveal Mercury’s ancient crustal field. *Science*, 22:892–895
4. James, P., Zuber, M., Phillips, R., and Solomon, S. (2015). Support of long-wavelength topography on Mercury inferred from MESSENGER measurements of gravity and topography. *Journal of Geophysical Research, Planets*, 120:287–310
5. James, P. B., Zuber, M. T., and Phillips, R. J. (2013). Crustal thickness and support of topography on Venus. *Journal of Geophysical Research, Planets*, 118:859–875

## SELECTED CONFERENCE PAPERS

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1. James, P., Phillips, R., Grott, M., Hauck II, S., and Solomon, S. (2016). The thickness of Mercury’s lithosphere inferred from MESSENGER gravity and topography. In *Proc. of the 47th Lunar and Planetary Sciences Conference*
2. James, P. (2016). Geophysical constraints on Europa’s ice shell and rocky core from a flyby mission. In *Proc. of the 47th Lunar and Planetary Sciences Conference*
3. James, P., Smith, D., Kendall, J., Zuber, M., and Solomon, S. (2015). The heterogeneous mantle under South Pole–Aitken Basin as constrained by GRAIL and LOLA observations. In *Proc. of the 46th Lunar and Planetary Sciences Conference*
4. James, P., Solomon, S., Zuber, M., and Phillips, R. (2014). What Mercury’s topographic rises tell us about the interior. In *Proc. of the 45th Lunar and Planetary Sciences Conference*
5. Phillips, R. J., Johnson, C. L., Perry, M. E., Hauck II, S. A., James, P. B., Mazarico, E., Lemoine, F. G., Neumann, G., Peale, S. J., Siegler, M. A., Smith, D. E., Solomon, S. C., and Zuber, M. T. (2014). Mercury’s 2nd degree shape and geoid: Lunar comparisons and thermal anomalies. In *Proc. of the 45th Lunar and Planetary Sciences Conference*
6. Selvans, M. M., Watters, T. R., James, P. B., and Solomon, S. C. (2014). Statistical analysis of the distribution of tectonic features and crustal thickness in the northern hemisphere of Mercury. In *Proc. of the 45th Lunar and Planetary Sciences Conference*
7. James, P. B., Zuber, M. T., Solomon, S. C., and Phillips, R. J. (2013). Localized gravitational admittance spectra on Mercury. In *Proc. of the 44th Lunar and Planetary Sciences Conference*
8. James, P. B., Zuber, M. T., Phillips, R. J., and Solomon, S. C. (2012). Viscosity structure of Mercury and support of the “northern rise”. In *Proc. of the 43rd Lunar and Planetary Sciences Conference*

## RECENT TALKS

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- Did magma ocean cumulate overturn occur on the Moon?** Aug 2016  
*LOLA/GRAIL STM – Falmouth, MA*
- Filtering techniques for shallow and deep inversions** May 2016  
*LOLA/GRAIL STM – Boulder, CO*
- Exploring the Rocky Planets in our Solar System Using Geophysics** Mar 2016  
*Baylor University Department of Geosciences – Waco, TX*
- The Thickness of Mercury’s Lithosphere Inferred from MESSENGER Gravity and Topography** Mar 2016  
*LPSC 47 – The Woodlands, TX*
- Planetary geophysics: Insights into our Solar Systems terrestrial bodies** Feb 2016  
*Lunar and Planetary Institute – Houston, TX*
- Data enhancement strategies and short-wavelength bulk density estimation** Feb 2016  
*LOLA/GRAIL STM – Honolulu, HI*
- The Moon’s South Pole-Aitken Basin** Feb 2016  
*Lamont-Doherty Earth Observatory MGG/SGT Seminar – Palisades, NY*
- Peak-ring densities and composition** Nov 2015  
*LOLA/GRAIL STM – Washington, DC*
- Compensation of topography at regional scales** Oct 2015  
*MESSENGER STM – Pearl River, NY*
- The Planet Mercury, as Revealed by MESSENGER** Sept 2015  
*Princeton University Department of Geosciences – Princeton, NJ*
- Orientation of South Pole–Aitken Basin** Aug 2015  
*LOLA/GRAIL STM – Falmouth, MA*
- Crustal Thickness Inside Mercurys Geochemical Terranes** June 2015  
*BepiColombo workshop – Berlin, Germany*
- The Heterogeneous Mantle Under South Pole–Aitken Basin** Mar 2015  
*LPSC 46 – The Woodlands, TX*
- Updates on South Pole-Aitken Mantle Heterogeneity** Feb 2015  
*LOLA/GRAIL STM – Tucson, AZ*
- Surface Strains at the Northern Rise** Oct 2014  
*MESSENGER STM – Santa Fe, AZ*
- The Mantle Under South Pole-Aitken, as Seen by GRAIL/LOLA** Sept 2014  
*LOLA/GRAIL STM – Falmouth, MA*
- Stresses from Long-Wavelength Topography on Mercury** May 2014  
*MESSENGER STM – Laurel, MD*
- What Mercury’s Topographic Rises Tell Us about the Interior** Mar 2014  
*LPSC 45 – The Woodlands, TX*
- Geophysics of the Moon, Venus, and Mercury** Feb 2014  
*LDEO Geodynamics Seminar – Palisades, NY*

## TEACHING EXPERIENCE

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- Teaching Assistant** Sept 2009 - Dec 2009  
*Massachusetts Institute of Technology*  
12.520 Geodynamics
- Teaching Assistant** June 2009 - Dec 2009  
*Massachusetts Institute of Technology*  
12.021 Earth Science, Energy, and the Environment
- Teaching Assistant** Jan 2008 - May 2008  
*Massachusetts Institute of Technology*  
12.005 Continuum Mechanics
- Teaching Assistant** Sept 2007 - Dec 2007  
*Massachusetts Institute of Technology*  
12.520 Geodynamics
- Tutoring & Grading** Sept 2004 - Dec 2006  
*Brown University*  
Provided one-on-one tutoring and graded homework for 100+ students in *MA001*, *MA018* & *MA020*

## ACADEMIC SERVICES

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### Session Convener

Co-convended a session titled “Judging a Book by its Cover: From Surface Observations to Planetary Interiors” at the 2015 fall meeting of the American Geophysical Union

### Grant Review Panelist

Served as an executive secretary and external reviewer for the Planetary Geology & Geophysics program and the Lunar Data Analysis Program, respectively

### Peer Reviewer

Reviewed articles for the Journal of Geophysical Research, Planets

### Dwornik Judge

Served as a judge for the Stephen E. Dwornik student awards at LPSC

### MGG/SGT Seminar Organizer

Organized a weekly seminar for the divisions of Marine Geology & Geophysics (**MGG**) and Seismology, Geology & Tectonophysics (**SGT** at the Lamont–Doherty Earth Observatory), Sept 2014 – present

### MIT150 Exploration Competition Organizer

Organized an exploration-themed competition for MIT undergraduate students with \$7000 in prize money, Sept 2010 – Apr 2011

[Video of the finalist presentations](#)

### Publicity Chair

National conference of the Students for the Exploration and Development of Space (**SEDS**), Apr 2008

## REFERENCES

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### Dr. Maria T. Zuber

- E. A. Griswold Professor of Geophysics in the Department of Earth, Atmospheric and Planetary Sciences, MIT
- Vice President of Research, MIT
- NASA GRAIL mission PI
- Member of the National Science Board

Email: [zuber@mit.edu](mailto:zuber@mit.edu)

Phone: 617-253-6397

### Dr. Sean C. Solomon

- Director of the Lamont–Doherty Earth Observatory at Columbia University
- 2014 Recipient of the National Medal of Science
- NASA MESSENGER mission PI

Email: [solomon@ldeo.columbia.edu](mailto:solomon@ldeo.columbia.edu)

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### Dr. Roger J. Phillips

- Research Scientist, Southwest Research Institute

Email: [roger@boulder.swri.edu](mailto:roger@boulder.swri.edu)

Phone: 303-546-9670

### Dr. Jason Soderblom

- Research Scientist, MIT
- Participating Scientist for the NASA/ESA Cassini mission

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