

# SIMON J. LOCK

Department of Earth and Planetary Sciences  
20 Oxford Street  
Harvard University  
Cambridge, MA 02138, U.S.A

slock@fas.harvard.edu  
(617) 520-4813  
www.people.fas.harvard.edu/~slock/  
orcid.org/0000-0001-5365-9616

## Research Interests

The formation, structure, and evolution of terrestrial and giant planets.

## EDUCATION

---

|  |                      |
|--|----------------------|
| <b>Graduate Student.</b> Department of Earth and Planetary Sciences,<br>Harvard University, Cambridge, MA                        | Anticipated May 2018 |
| <b>M.A.</b> Department of Earth and Planetary Sciences,<br>Harvard University, Cambridge, MA                                     | 2014                 |
| <b>MSci. (1st Class)</b> Natural Sciences (Experimental and Theoretical Physics),<br>University of Cambridge, Cambridge, UK      | 2012                 |
| <b>B.A. (Hons, 1st Class)</b> Natural Sciences (Experimental and Theoretical Physics),<br>University of Cambridge, Cambridge, UK | 2012                 |

## PROFESIONAL EXPERIENCE

---

|  |              |
|--|--------------|
| <b>Graduate Student Fellow.</b> Department of Earth and Planetary Sciences,<br>Harvard University, Cambridge, MA       | 2012–present |
| <b>Masters and Undergraduate Student.</b> Natural Sciences<br>University of Cambridge, Cambridge, UK                   | 2008-2012    |
| <b>SURF Fellow.</b> Division of Geological and Planetary Sciences,<br>California Institute of Technology, Pasadena, CA | 2011         |

## AWARDS AND HONORS

---

|  |             |
|--|-------------|
| NASA Earth and Space Science Fellowship  | 2013–2016   |
| University Certificate of Distinction in Teaching, Harvard University  | 2013 & 2014 |
| Dirac Prize, St. John's College, University of Cambridge   | 2012        |
| Morton Prize, St. John's College, University of Cambridge  | 2012        |
| United Steel Companies Scholarship, St. John's College, University of Cambridge                                  | 2011 & 2012 |
| Elected a member of "The Foundation of the College of St. John the Evangelist<br>in the University of Cambridge" | 2011        |

## PROFFESIONAL MEMBERSHIPS

---

American Geophysical Union  
Institute of Physics, UK

## TEACHING EXPERIENCE

---

|   |      |
|---|------|
| Guest lecturer, <i>GEL36: The solar system</i> , UC Davis                                   | 2017 |
| Guest lecturer & advisor, <i>GEL251: Thermodynamics of the Earth and planets</i> , UC Davis | 2015 |
| Teaching fellow, <i>SPU30: Life as a planetary phenomena</i> , Harvard University           | 2014 |
| Teaching fellow, <i>SPU14: How to build a habitable planet</i> , Harvard University         | 2013 |

## OTHER SKILLS AND INTERESTS

---

Fluent or highly competent in several programming and scripting languages including: C; C++; Fortran; Python, MATLAB; Bash and C Shell. Keen interest in scientific communication and public outreach.

## PEER-REVIEWED PUBLICATIONS

---

2. **Lock, S. J.** and S. T. Stewart. The structure of terrestrial bodies: Impact heating, corotation limits and synestias. *JGR: Planets* **122**, pp 950-982, doi:10.1002/2016JE005239, 2017.
1. Čuk, M., D. Hamilton, **Lock, S. J.** and S. T. Stewart. Tidal evolution of the Moon from a high-obliquity, high-angular-momentum Earth. *Nature* **539**, pp 402-406, doi:10.1038/nature19846, 2016.

## IN PROGRESS

---

1. **Lock, S. J.**, S. T. Stewart, M. I. Petaev, Z. M. Leinhardt, M. T. Mace, S. B. Jacobsen and M. Čuk. The origin of the Moon within a terrestrial synestia. *JGR: Planets*, accepted.
2. **Lock, S. J.**, S. T. Stewart and S. Mukhopadhyay. Recovery of Earth after the Moon forming impact: Increasing the pressure. In prep.
3. **Lock, S. J.**, S. T. Stewart and M. Čuk. Recovery of Earth after the Moon forming impact: Accounting for the energy. In prep.
4. **Lock, S. J.**, S. T. Stewart and S. Mukhopadhyay. Atmospheric loss by giant impacts: A stochastic process in planet formation. In prep.
5. E. V. Quintana, T. Barclay, **S. J. Lock**, S. T. Stewart, J. E. Chambers, J. J. Lissauer. Mars as a remnant planetary embryo that survived the giant impact phase. In prep.

## OTHER PUBLICATIONS

---

1. **Lock, S. J.** A new theory of how the Moon formed. *Scientific American*, 2017.

## INVITED TALKS AND SEMINARS

---

- University of Cambridge, Bullard Laboratories seminar, 2017. *The last stage of Earth's formation: Increasing the pressure.*
- University of Cambridge, Institute of Astronomy, 2017. *A new exhibit in the planetary zoo: Hot, rotating rocky planets.*
- ACCRETE International Interdisciplinary Workshop, 2017. *A new model for lunar origin: Equilibration with Earth beyond the corotation limit.*
- American Geophysical Union Fall Meeting, 2016. *Preservation of primordial mantle in the aftermath of a giant impact.*
- University of California, Berkeley, CIPS seminar, 2016. *A new exhibit in the planetary zoo: Hot, rotating rocky planets.*
- University of Bristol, Astrophysics seminar, 2016. *A new model for lunar origin: Equilibration with Earth beyond the hot spin stability limit.*

American Geophysical Union Fall Meeting, 2015. *Condensing the Moon from a MAD Earth*.  
The University of Chicago, Geophysical Sciences Department Colloquium, 2015. *Condensing the Moon from a MAD Earth*.

## SELECTED CONFERENCE PROCEEDINGS

---

6. **Lock, S. J.**, S. T. Stewart, M. I. Petaev, Z. M. Leinhardt, M. T. Mace, S. B. Jacobsen and M. Čuk. A new model for lunar origin: Equilibration with Earth beyond the hot spin stability limit. *Lunar & Planet. Sci. Conf.* **47**, Abs. 2881, 2016.
5. **Lock, S. J.** and S. T. Stewart. A hot spin stability limit for terrestrial planets. *Lunar & Planet. Sci. Conf.* **47**, Abs. 2856, 2016.  
Huang, S., M. I. Petaev, W. Wang, **S. J. Lock**, Z. Wu, S. T. Stewart and S. B. Jacobsen. Lunar origin beyond the hot spin stability limit: Stable isotopic fractionation. *Lunar & Planet. Sci. Conf.* **47**, Abs. 2261, 2016.
4. Stewart, S. T., **S. J. Lock** and S. Mukhopadhyay. Partial atmospheric loss and partial mantle melting during the giant impact stage of planet formation. *AGU Fall Meeting*, Abs. P44A-06, 2014.
3. **Lock, S. J.**, S. T. Stewart and S. Mukhopadhyay. Was the atmosphere lost during the Moon-forming giant impact? *Lunar & Planet. Sci. Conf.* **45**, Abs. 2843, 2014.
2. Stewart, S. T., **S. J. Lock** and S. Mukhopadhyay. Atmospheric loss and volatile fractionation during giant impacts. *Lunar & Planet. Sci. Conf.* **45**, Abs. 2869, 2014.
1. **Lock, S. J.** and S. T. Stewart. Atmospheric loss during high angular momentum giant impacts *Lunar & Planet. Sci. Conf.* **44**, Abs. 2608, 2013.