

SIMON J. LOCK

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Research Interests

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

EDUCATION

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

PROFESIONAL EXPERIENCE

- Graduate Student Fellow.** Department of Earth and Planetary Sciences, Harvard University, Cambridge, MA 2012–present
- Masters and Undergraduate Student.** Natural Sciences University of Cambridge, Cambridge, UK 2008-2012
- SURF Fellow.** Division of Geological and Planetary Sciences, 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 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

3. **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. doi:10.1002/2017JE005333
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. 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. Submitted.
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.

OTHER PUBLICATIONS

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

INVITED TALKS AND SEMINARS

The University of Chicago, Geophysical Sciences Department, 2018. *Recovery of the Earth after the Moon-forming giant impact.*

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.