

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 PhD anticipated Sept 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*, **123**, pp 910-951, doi:10.1002/2017JE005333, 2018.
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.