

# SARAH T. STEWART

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## EDUCATION

Ph.D., Planetary Sciences, minor in Astrophysics, California Institute of Technology, Pasadena, CA 2002  
A.B., Astronomy & Astrophysics and Physics cum laude, Harvard University, Cambridge, MA 1995

## PROFESSIONAL EXPERIENCE

*Professor*, U. California, Davis 2014-present  
*Visiting Professor*, Harvard University 2014-2016  
*Professor of Earth and Planetary Sciences*, Harvard University 2012-2014  
*John L. Loeb Associate Professor of the Natural Sciences*, Harvard University 2009-2012  
*Assistant Professor of Planetary Science*, Harvard University 2003-2009  
*G. K. Gilbert Postdoctoral Fellow*, Carnegie Institution of Washington, Washington, D.C. 2002-2003

## RESEARCH INTERESTS

Planet formation and evolution with focus on collisional processes. Laboratory measurements of the equation of state and rheological properties of planetary materials using shock wave techniques. Computational and laboratory technique development for study of shock processes. Shock processes in heterogeneous materials. Experimental and computational studies of impact processes to interpret the formation, resurfacing history, physical properties, and internal structure of planets and small bodies.

## ACADEMIC HONORS

Stephen E. Dworkin Planetary Geoscience Student Paper Award, Geological Society of America (2001)  
Grove Karl Gilbert Postdoctoral Fellowship, Carnegie Institution of Washington (2002)  
Presidential Early Career Award for Scientists and Engineers (2003)  
Harold C. Urey Prize, Division for Planetary Sciences, American Astronomical Society (2009)  
Inaugural Thomas J. and Earleen Ahrens Lecturer, California Institute of Technology (2014)  
MacArthur Fellow (2018)

## MEDIA RECOGNITION

Brilliant 10, Popular Science (2010)  
Astronomy's Rising Stars, Astronomy Magazine (2013)  
Top 100 Science Stories of 2015, Discover Magazine (2015)

## ACADEMIC SERVICE AND CONSULTING

Selected Academic Service Appointments  
President, Planetary Sciences Section of the American Geophysical Union, 2016-2018  
American Physical Society Topical Group on Shock Compression of Condensed Matter, Fellows Committee, 2016-present  
President-elect, Planetary Sciences Section of the American Geophysical Union, 2015  
Associate Editor, *J. Geophysical Research Planets*, 2011-2014

## National Committees and Panels

Controlling Material Response Panel, The Future of Compression Science, Los Alamos National Laboratory, 2009  
*A Summary Report on the 21<sup>st</sup> Century Needs and Challenges of Compression Science Workshop*, Los Alamos National Laboratory Technical Report LA-UR 09-07771, pp. 42, 2009.

Mitigation Panel, Committee to Review Near-Earth Object Surveys and Hazard Mitigation Strategies, National Research Council, 2009  
*Defending Planet Earth: Near-Earth Object Surveys and Hazard Mitigation Strategies*, National Academy of Sciences, pp. 149, 2010.

Materials in Extremes and Planetary Physics Panel, Basic Research Directions Workshop on User Science at the National Ignition Facility (NIF), Department of Energy, 2011  
*Basic Research Directions for User Science at the National Ignition Facility*, Eds. J. Sarrao, K. Budil, M. Wiescher, NNSA-DOE, pp. 141, 2011.

National Ignition Facility, Technical Review Committee, 2015-present, Chair 2017-present  
Standing Committee on Astrobiology and Planetary Science, National Academies of Sciences, Engineering and Medicine, 2016-2017

#### Selected Education and Public Outreach

*Essential Science for Teachers: Earth and Space* video series, Annenberg/CPB, Producer Shannon Densmore, Executive Producer Alex Griswold, Science Media Group, Center for Astrophysics: Science advisor and interviewee, 2003-2004

Harvard Museum of Natural History: Science advisor for new meteorites exhibit; PI on E/PO video display, *Impact! The making of a meteorite*, 2005-2008  
Sacco, J. C., S. T. Stewart, A. Griswold, Z. M. Leinhardt, IMPACT! An Asteroid's Journey to Earth – Interactive Visualizations for Museums and Classrooms, *Lunar & Planetary Science Conference* 39, #2487, 2008.

NOVA *Finding Life Beyond Earth*, interviewee, 2011  
Current Science magazine, careers profile, 2011  
Popular Science magazine, Labs that go Boom, 2012  
Astro Confidential, 2012  
Space's Deepest Secrets Episode *Dark Origins of the Moon*, interviewee, 2018

#### U. California Davis Committees

College of Letters & Science, Reorganization Committee, 2014-2015  
College of Letters & Science, Visioning Committee, 2015-2016  
Physics Department, Astrophysics Faculty Search, 2015-2016  
Earth and Planetary Sciences, Earth and Planetary Materials Faculty Search, 2015-2016  
MPS Division Machine Shops Committee, 2016-2017

#### Harvard University Committees

Faculty of Arts and Sciences, Science Education Committee, 2006-2007  
Earth and Planetary Sciences, Undergraduate Studies, 2003-2013, co-Director, 2010-2014  
Earth and Planetary Sciences, Daly Postdoctoral Fellowship, 2003-2006  
Earth and Planetary Sciences, Faculty Search Committees, 2004-2009  
Earth and Planetary Sciences, Collections Committee, 2009-2010

#### Professional Memberships

American Geophysical Union  
American Astronomical Society, Division for Planetary Sciences  
American Physical Society, topical group on Shock Compression of Condensed Matter  
American Association for the Advancement of Science  
Meteoritical Society  
International Astronomical Union

#### PAST AND PRESENT RESEARCH PROGRAMS

*Mapping water on Mars using fluidized crater morphologies: A new physical approach*  
P.I., NASA Mars Data Analysis Program, 2003-2006

*Experimental Investigation of Martian Impact Processes*  
P.I., NASA Mars Fundamental Research Program, 2003-2006

*Experimental Investigation of Porosity and Volatility in Impact Processes*  
P.I., NASA Planetary Geology and Geophysics Program, 2004-2006

*Alteration of Composition and Structure in Cometesimals during Collisional Evolution*  
P.I., NASA Outer Planets Research Program, 2005-2007

*Collaborative Study of Lonar Crater, India*  
P.I., NASA Mars Fundamental Research Program, 2005-2006

*Experimental Investigation of Planetary Impact Processes: Porosity and Post-Shock Temperatures*  
P.I., NASA Planetary Geology and Geophysics Program, 2006-2011

*Shock and magnetism: Experiments to bridge the nanoscale to the planetary scale*  
P.I., NASA Mars Fundamental Research Program, 2007-2009

*Catastrophic Disruption of Small Bodies in the Outer Solar System*  
P.I., NASA Outer Planets Research Program, 2009-2012

*Magnetism of extraterrestrial materials – an integrated study*  
Collaborator (P.I. J. Gattacceca, CEREGE), International Project for Scientific Cooperation, CNRS, 2010-2012

*Shock Response of Dry and Water-Saturated Soils*  
P.I., Army Research Office, 2010-2013

*Static and shock pressure treatment of synthetic Mars basalts: Implications for understanding the evolution of crustal magnetic anomalies*  
Co-I (P.I. S. Brachfeld, Montclair State), NASA Mars Fundamental Research Program, 2011-2014

*Testing the Borealis Impact Hypothesis: An investigation of mantle and crustal signatures from a giant impact*  
P.I., NASA Mars Fundamental Research Program, 2011-2014

*Giant impacts on terrestrial planets: A high-resolution 3D study of magma ocean formation and atmospheric blowoff*  
P.I., NASA Origins of Solar Systems Program, 2011-2014

*Mobilization of water during planetary collisions: Shock thermodynamics experiments on icy mixtures and hydrated minerals*  
P.I., NASA Planetary Geology and Geophysics Program, 2011-2015

*Investigating martian impact processes and crustal magnetic properties with multiple datasets*  
Co-I (P.I. R. Lillis, U.C. Berkeley), NASA Mars Data Analysis Program, 2011-2014

*Dynamic High-Pressure Behavior of Hierarchical Heterogeneous Geological Materials*  
Co-I (P.I. N. Thadhani, GA Tech) Air Force Physics of Heterogeneous Materials, 2012-2015

*Analytic models for outcomes of collisions between icy bodies*  
P.I., NASA Outer Planets Research Program, 2012-2015

*From Z to Planets*  
Co-I (P.I. S. Jacobsen, Harvard), DOE/NNSA High Energy Density Laboratory Plasmas, 2012-2015

*Shock-induced Melting and Vaporization Experiments on Planetary Materials*  
P.I., NASA Solar System Workings Program, 2015-2019

*From Z to Planets: Phase II*  
Co-I (P.I. S. Jacobsen, Harvard), DOE/NNSA High Energy Density Laboratory Plasmas, 2015-2018

*Multi-Programmatic Research with High Energy Density (HED) Science*  
P.I., Lawrence Livermore National Laboratory, 2016-2018

*Center for Frontiers in High Energy Density Physics*  
Co-P.I. (P.I. F. Beg, UC San Diego), UC Office of the President, 2017-2020

*Center for Matter under Extreme Conditions*  
Co-P.I. (P.I. F. Beg, UC San Diego), DOE Stewardship Science Academic Alliance, 2018-2023

*Origin and Cycles of Life-Essential Ingredients in Young Rocky Planets*  
Co-I (P.I. R. Dasgupta, Rice University), NASA NExSS Team, 2018-2023

*Impact-Driven Chemistry and its Role in the Surface Environment of the Early Earth*  
P.I., Simons Collaboration on the Origins of Life, 2018-2021

*From Z to Planets: Phase III*  
Co-I (P.I. S. Jacobsen, Harvard), DOE/NNSA Stewardship Science Academic Alliances, 2019-2021

## *PAST AND PRESENT FACILITY TIME AND DEVELOPMENT PROGRAMS*

### *40-mm Impact Research System for Harvard's Shock Compression Laboratory*

P.I., NASA Planetary Major Equipment Program, 2003

### *Dynamic Compression Sector at the Advanced Photon Source*

Team member (P.I. Y. Gupta, WSU), Facility Development Proposal, Argonne National Laboratory, 2009

### *Investigation of Phase Transitions on Release from Shock in H<sub>2</sub>O and SiO<sub>2</sub>*

P.I., LLNL Jupiter Laser Facility, 2010

### *Large volume sample recovery at NIF: Concept Development*

P.I., National Ignition Facility, Lawrence Livermore National Laboratory, 2011-2012

### *Formation and evolution of Earth and Earth-like planets: Fundamental planetary material property experiments on Z*

Co-P.I. (Co-P.I. S. Jacobsen, Harvard), Sandia Z Accelerator Fundamental Science Experiments, 2012-2016

### *Instability Growth in Materials with Strength: Viscosity, growth rates, and shock recovery validation experiments*

P.I., LLNL Jupiter Laser Facility, 2012

### *The Chemical Origins of the Earth and Moon: Investigating Shock-Induced Fe Redox States*

P.I., LLNL Jupiter Laser Facility, 2014

### *Quantifying Vaporization and Melting during Planetary Formation*

P.I., LLNL Jupiter Laser Facility, 2015

### *The Iron Melting Curve and the Magnetospheres of Habitable Super-Earths*

Co-I. (P.I. R. Hemley, CIW), NIF Discovery Science Program, 2015 and 2016

### *A 2-stage Light Gas Gun for the Shock Compression Laboratory at UC Davis*

P.I., NASA Planetary Major Equipment Program, 2015

### *Formation and evolution of Earth and Earth-like planets: Fundamental planetary material property experiments on Z – Phase II*

Co-P.I. (Co-P.I. S. Jacobsen, Harvard), Sandia Z Accelerator Fundamental Science Experiments, 2016-2017

### *Formation and evolution of Earth and SuperEarth-like planets: Fundamental planetary material property experiments on Z – Phase III*

Co-P.I. (Co-P.I. S. Jacobsen, Harvard), Sandia Z Accelerator Fundamental Science Experiments, 2018-2019

### *Investigating giant impacts between rocky planets with high-pressure melting and shock equation of state measurements on complex silicates*

Co-I. (Co-P.I. D. Fratanduono, M. Millot, LLNL), U. Rochester Omega EP Experiments, 2019

## *ADVISING AND MENTORING*

### Graduate students

K. L. Louzada (2003-2009) – “The effects of impact cratering on planetary crustal magnetism”

L. E. Senft (2004-2009) – “The effect of target properties on impact cratering”

R. A. Marcus (2008-2011) – “The Role of Giant Impacts in Planet Formation and Internal Structure”  
(co-advised with L. Hernquist and D. Sasselov)

R. G. Kraus (2008-2013) – “On the Thermodynamics of Planetary Impact Events”

W. M. Steinhardt (2011-2013) – Shock physics and high-pressure experiments

S. J. Lock (2012-2018) – “The formation, structure and evolution of terrestrial planets”

E. Davies (2014+) – Shock physics and planet formation

G. Hollyday (2016+) – Planet formation

K. Amodeo (2017+) – Planet formation

### Postdoctoral associates

Z. M. Leinhardt (2005-2007) – Collisional modification of small bodies

M. Čuk (2008-2012, Daly-Clay Fellow) – Solar system dynamics; history of Earth-moon system

G. Sarid (2012-2014) – Collisional and thermal evolution of icy bodies

D. Spaulding (2012-2015, Origins Fellow) – Shock processes on volatile and organic materials

P. Carter (2017+) – Planet formation, collisional processes  
B. Chidester (2018+) – Planetary material properties, planet formation  
M. Duncan (2018+) – Planetary material properties, planet formation

Undergraduate theses

B. A. Black (2004-2005): Looking Beneath the Surface: Measurements of Impact Crater Geometries Provide Evidence for Ice-Rich Deposits at Low Latitudes on Mars (Hoopes Prize winner; published in *J. Geophysical Research – Planets*)

F. M. McEachern (2008-2009): Dynamical Evolution of the Hungaria Asteroids (Hoopes Prize winner; published in *Icarus*)

M. Newman (2012-2013): Heating System for Emissivity Measurements (B.S. in Engineering Sciences)

Harvard College Program for Research in Science and Engineering (PRISE)

2007: Andrea Peterson, Firth McEachern

2008: Sonya Mollinger, Peter Hedman

2010: Matthew Newman

Harvard Board of Freshman Advisors (2008-2011)

*SELECTED INVITED PRESENTATIONS*

41<sup>st</sup> Division for Planetary Sciences Meeting, 2009, Urey Prize Plenary lecture: *Impacts onto icy bodies: A journey from the laboratory to the outer solar system*

11<sup>th</sup> Hypervelocity Impact Symposium, 2010, Plenary lecture: *The role of phase changes on the thermodynamics and mechanics of impact cratering in H<sub>2</sub>O ice*

Research at High Pressure, Gordon Research Conference, 2010, Invited lecture: *Planetary impact dynamics: The importance of phase changes on decompression*

17<sup>th</sup> American Physical Society Topical Conference on Shock Compression of Condensed Matter, 2011, Plenary lecture: *New Frontiers at the Intersection of Shock Physics and Planetary Sciences*

Origin of the Moon Conference, The Royal Society of London, 2013, Invited presentation: *A sequence of giant impacts leading to the origin of the Earth and Moon*

Science Research Lecture (public lecture series), Harvard University, 2013, *The Violent Origin of the Earth and Moon*

Thomas J. and Earleen Ahrens Lecture, California Institute of Technology, 2014, *The Origin of the Earth and Moon*

Physics of Exoplanets: From Earth-sized to Mini-Neptunes, Kavli Institute for Theoretical Physics Conference, 2015, Invited presentation: *Growing Planets by Giant Impacts: A Diversity of Outcomes*

5<sup>th</sup> International Conference on High Energy Density Physics, 2015, Invited presentation: *Transforming the Earth into a High Energy State: The Physics of Giant Impacts and Lunar Origin*

20<sup>th</sup> APS Topical Conference on Shock Compression of Condensed Matter, 2017, Invited presentation: *Shock-and-Release to the Liquid-Vapor Phase Boundary: Experiments and Applications to Planetary Science*

2018 Miller Institute Symposium, Invited presentation: *The Origin of the Earth and Moon*

2018 Kavli Institute for Theoretical Physics, Chalk Talk: *Earth's recovery from the Moon-forming giant impact*

## **PUBLICATIONS – CHRONOLOGICAL BY ACCEPTANCE DATE**

Student and postdoctoral advisees underlined.

1. Orton, G., J. L. Ortiz, K. Baines, G. Bjoraker, U. Carsenty, F. Colas, A. Dayal, D. Deming, P. Drossart, E. Frappa, J. Friedson, J. Goguen, W. Golisch, D. Griep, C. Hernandez, W. Hoffmann, D. Jennings, C. Kaminski, J. Kuhn, P. Laques, S. Limaye, H. Lin, J. Lecacheux, T. Martin, G. McCabe, T. Momary, D. Parker, R. Puetter, M. Ressler, G. Reyes, P. Sada, J. Spencer, J. Spitale, **S. Stewart**, J. Varsik, J. Warell, W. Wild, P. Yanamandra-Fisher, G. Fazio, J. Hora, L. Deutsch. Earth-based observations of the Galileo probe entry site. *Science* **272**, 839-840, doi:10.1126/science.272.5263.839, 1996.
2. Orton, G. S., B. M. Fisher, K. H. Baines, **S. T. Stewart**, A. J. Friedson, J. L. Ortiz, M. Marinova, M. Ressler, A. Dayal, W. Hoffmann, J. Hora, S. Hinkley, V. Krishnan, M. Masanovic, J. Tesic, A. Tziolas, K. C. Parija. Characteristics of the Galileo probe entry site from Earth-based remote sensing observations. *J. Geophysical Research: Planets* **103**, 22791-22814, doi:10.1029/98JE02380, 1998.
3. Ortiz, J. L., G. S. Orton, A. J. Friedson, **S. T. Stewart**, B. M. Fisher, J. R. Spencer. Evolution and persistence of 5- $\mu$ m hot spots at the Galileo probe entry latitude. *J. Geophysical Research: Planets* **103**, 23051-23069, doi:10.1029/98JE00696, 1998.
4. **Stewart, S. T.**, T. J. Ahrens. Shock Wave Propagation in Porous Ice. In *Shock Compression of Condensed Matter-1999*, AIP Conference Proceedings **505**, pp.1243-1246. Eds. M.D. Furnish, L.C. Chhabildas, R.S. Hixson. American Institute of Physics, doi:10.1063/1.1303686, 2000.
5. O'Keefe, J. D., **S. T. Stewart**, M. E. Lainhart, T. J. Ahrens. Damage and rock-volatile mixture effects on impact crater formation. *International Journal of Impact Engineering* **26**, 543-553, doi:10.1016/S0734-743X(01)00112-9, 2001.
6. Weiss, B. P., D. L. Shuster, **S. T. Stewart**. Temperatures on Mars:  $^{40}\text{Ar}/^{39}\text{Ar}$  Thermochronology of ALH84001. *Earth and Planetary Science Letters* **201**, 465-472, doi:10.1016/S0012-821X(02)00729-X, 2002.
7. Weiss, B. P., H. Vali, F. J. Baudenbacher, J. L. Kirschvink, **S. T. Stewart**, D. L. Shuster. Records of an ancient Martian magnetic field in ALH84001. *Earth and Planetary Science Letters* **201**, 449-464, doi:10.1016/S0012-821X(02)00728-8, 2002.
8. **Stewart, S. T.**, F. Nimmo. Surface runoff features on Mars: Testing the carbon dioxide formation hypothesis. *J. Geophysical Research: Planets* **107**, 5069, doi:10.1029/2000JE001465, 2002.
9. **Stewart, S. T.**, T. J. Ahrens. Shock Hugoniot of H<sub>2</sub>O ice. *Geophysical Research Letters* **30**, 1332, doi:10.1029/2002GL016789, 2003.
10. **Stewart, S. T.**, T. J. Ahrens, J. D. O'Keefe. Impact-Induced Melting of Near-Surface Water Ice on Mars. In *Shock Compression of Condensed Matter-2003*, AIP Conference Proceedings **706**, pp. 1484-1487, Eds. M.D. Furnish, Y. M. Gupta, and J. W. Forbes, American Institute of Physics, doi:10.1063/1.1780519, 2004.
11. **Stewart, S. T.**, T. J. Ahrens. A New H<sub>2</sub>O Ice Hugoniot: Implications for Planetary Impact Events. In *Shock Compression of Condensed Matter-2003*, AIP Conference Proceedings **706**, pp. 1478-1483, Eds. M.D. Furnish, Y. M. Gupta, and J. W. Forbes, American Institute of Physics, doi:10.1063/1.1780518, 2004.
12. **Stewart, S. T.**, T. J. Ahrens. Shock Properties of H<sub>2</sub>O ice. *J. Geophysical Research: Planets* **110**, E03005, doi:10.1029/2004JE002305, 2005.
13. Yoshimura, Y., **S. T. Stewart**, M. Somayazulu, H.-K. Mao, R. J. Hemley. High-pressure x-ray diffraction and Raman spectroscopy of ice VIII. *J. Chemical Physics* **124**, 024502, doi:10.1063/1.2140277, 2006.
14. **Stewart, S. T.**, G. B. Kennedy, L. E. Senft, M. R. Furlanetto, A. W. Obst, J. R. Payton, A. Seiffter. Post-Shock Temperature and Free Surface Velocity Measurements of Basalt. In *Shock Compression of Condensed Matter-2005*, AIP Conference Proceedings **845**, pp. 1484-1487, Eds. M. D. Furnish, M. Elert, T. P. Russell, C. T. White, American Institute of Physics, doi:10.1063/1.2263605, 2006.
15. Seiffter, A., **S. T. Stewart**, M. R. Furlanetto, G. B. Kennedy, J. R. Payton, A. W. Obst. Post-Shock Temperature Measurements of Aluminum. In *Shock Compression of Condensed Matter-2005*, AIP Conference Proceedings **845**, pp. 139-142, Eds. M. D. Furnish, M. Elert, T. P. Russell, C. T. White, American Institute of Physics, doi:10.1063/1.2263284, 2006.
16. Louzada, K. L., **S. T. Stewart**, B. P. Weiss. Shock Demagnetization of Pyrrhotite (Fe<sub>1-x</sub>S, x<0.13) and Implications for the Martian Crust and Meteorites. In *Shock Compression of Condensed Matter-2005*,

- AIP Conference Proceedings **845**, pp. 1476-1479, Eds. M. D. Furnish, M. Elert, T. P. Russell, C. T. White, American Institute of Physics, doi:10.1063/1.2263603, 2006.
17. **Stewart, S. T., G. J. Valiant.** Martian subsurface properties and crater formation processes inferred from fresh impact crater geometries. *Meteoritics and Planetary Sciences* **41**, 1509-1537, doi:10.1111/j.1945-5100.2006.tb00433.x, 2006.
  18. **Louzada, K. L., S. T. Stewart,** and B. P. Weiss. Effect of shock on the magnetic properties of pyrrhotite, the Martian crust, and meteorites. *Geophysical Research Letters* **34**, L05204, doi:10.1029/2006GL027685, 2007.
  19. Yoshimura, Y., **S. T. Stewart,** H.-K. Mao, R. J. Hemley. *In situ* Raman spectroscopy of low-temperature/high-pressure transformations of H<sub>2</sub>O. *J. Chemical Physics* **126**, 174505, doi:10.1063/1.2720830, 2007.
  20. **Senft, L. E., S. T. Stewart.** Modeling Impact Cratering in Layered Surfaces. *J. Geophysical Research: Planets* **112**, E11002, doi:10.1029/2007JE002894, 2007.
  21. **Black, B. A., S. T. Stewart.** Excess ejecta craters record episodic ice-rich layers at middle latitudes on Mars. *J. Geophysical Research: Planets* **113**, E02015, doi:10.1029/2007JE002888, 2008.
  22. **Halevy, I., S. T. Stewart.** Is Enceladus' Plume Tidally Controlled? *Geophysical Research Letters* **35**, L12203, doi:10.1029/2008GL034349, 2008.
  23. **Louzada, K. L., B. P. Weiss, A. C. Maloof, S. T. Stewart,** N. Swanson-Hysell, S. A. Soule. Paleomagnetism of Lonar Impact Crater, India. *Earth and Planetary Science Letters* **275**, 308-319, doi:10.1016/j.epsl.2008.08.025, 2008.
  24. **Senft, L. E., S. T. Stewart.** Impact Crater Formation in Icy Layered Terrains on Mars. *Meteoritics and Planetary Science* **43**, 1993-2013, doi:10.1111/j.1945-5100.2008.tb00657.x, 2008.
  25. **Leinhardt, Z. M., S. T. Stewart.** Full Numerical Simulations of Catastrophic Small Body Collisions. *Icarus* **199**, 542-559, doi:10.1016/j.icarus.2008.09.013, 2009.
  26. **Stewart, S. T., A. Seifert, A. W. Obst.** Shocked H<sub>2</sub>O Ice: Thermal Emission Measurements and the Criteria for Phase Changes during Impact Events. *Geophysical Research Letters* **35**, L23203, doi:10.1029/2008GL035947, 2008.
  27. Maloof, A. C., **S. T. Stewart,** B. P. Weiss, S. A. Soule, N. L. Swanson-Hysell, **K. L. Louzada,** I. Garrick-Bethell, P. M. Poussart. Geology of Lonar Crater, India. *Geological Society of America Bulletin* **122**, 109-126, doi:10.1130/B26474.1, 2010.
  28. **Stewart, S. T., Z. M. Leinhardt.** Velocity-dependent Catastrophic Disruption Criteria for Planetesimals. *Astrophysical Journal Letters* **691**, L133-L137, doi:10.1088/0004-637X/691/2/L133, 2009.
  29. **Marcus, R. A., S. T. Stewart,** D. Sasselov, L. Hernquist. Collisional Stripping and Disruption of Super-Earths. *Astrophysical Journal Letters* **700**, L118-L122, doi:10.1088/0004-637X/700/2/L118, 2009.
  30. **Louzada, K. L., S. T. Stewart.** Effects of Planet Curvature and Crust on the Shock Pressure Field around Impact Basins. *Geophysical Research Letters*, **36**, L15203, doi:10.1029/2009GL037869, 2009.
  31. **Senft, L. E., S. T. Stewart.** Dynamic Fault Weakening and the Formation of Large Impact Craters. *Earth and Planetary Science Letters* **287**, 471-482, doi:10.1016/j.epsl.2009.08.033, 2009.
  32. **Kraus R. G., S. T. Stewart,** A. Seifert, A. W. Obst. Shock and Post-Shock Temperatures in an Ice-Quartz Mixture: Implications for Melting During Planetary Impact Events. *Earth and Planetary Science Letters* **289**, 162-170, doi:10.1016/j.epsl.2009.11.002, 2010.
  33. **Louzada, K. L., S. T. Stewart,** B. P. Weiss, J. Gattacceca, N. S. Bezaeva. Shock and static pressure demagnetization of pyrrhotite and implications for the Martian crust. *Earth and Planetary Science Letters* **290**, 90-101, doi:10.1016/j.epsl.2009.12.006, 2010.
  34. **Čuk, M., B. J. Gladman, S. T. Stewart.** Constraints on the Source of Lunar Cataclysm Impactors. *Icarus* **207**, 590-594, doi:10.1016/j.icarus.2009.12.013, 2010.
  35. **Marcus, R. A., D. Sasselov, L. Hernquist, S. T. Stewart.** Minimum Radii of Super-Earths: Constraints from Giant Impacts. *The Astrophysical Journal Letters* **712**, L73-L76, doi:10.1088/2041-8205/712/1/L73, 2010.
  36. Lillis, R. J., M. E. Purucker, J. S. Halekas, **K. L. Louzada, S. T. Stewart-Mukhopadhyay,** M. Manga, H. V. Frey. Study of impact demagnetization at Mars using Monte Carlo modeling and multiple altitude data. *J. Geophysical Research: Planets* **115**, E07007, doi:10.1029/2009JE003556, 2010.
  37. **Leinhardt, Z. M., R. A. Marcus, S. T. Stewart.** The Formation of the Collisional Family around the Dwarf Planet Haumea. *Astrophysical Journal* **714**, 1789-1799, doi:10.1088/0004-637X/714/2/1789, 2010.

38. Boyce, J., N. Barlow, P. Mougini-Mark, **S. Stewart**. Rampart craters on Ganymede: their implications for fluidized ejecta emplacement. *Meteoritics and Planetary Science* **45**, 638-661, doi:10.1111/j.1945-5100.2010.01044.x, 2010.
39. Marcus, R. A., D. Sasselov, **S. T. Stewart**, L. Hernquist. Water/Icy Super-Earths: Giant Impacts and Maximum Water Content. *Astrophysical Journal Letters* **719**, L45-L49, doi:10.1088/2041-8205/719/1/L45, 2010.
40. Weiss, B. P., S. Pedersen, I. Garrick-Bethell, **S. T. Stewart**, K. L. Louzada, A. C. Maloof, N. L. Swanson-Hysell. Paleomagnetism of impact spherules from Lonar crater, India and a test for impact-generated fields. *Earth and Planetary Science Letters* **298**, 66-76, doi:10.1016/j.epsl.2010.07.028, 2010.
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Student and postdoctoral advisees underlined.

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