Linda Tarbox Elkins-Tanton

Curriculum Vitae

December 5, 2013

Director, Department of Terrestrial Magnetism
Carnegie Institution for Science 202-478-8828
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Research Interests

Theory and experiments concerning silicate melting and solidification processes, including planetary formation, magma oceans, and subsequent planetary evolution, formation of large volcanic provinces, and interactions between silicate planets and their atmospheres.

Degrees

Ph.D., Geology and Geophysics, MIT, 2002, Timothy L. Grove and Bradford H. Hager
M.S., Geochemistry, MIT, 1987, Timothy L. Grove
B.S., Geology, MIT, 1987

Employment

Director, Dept. of Terrestrial Magnetism, Carnegie Institution for Science, 2011 – current
Visiting Professor of Geology, MIT, 2011 – current
Mitsui Associate Professor of Geology, MIT, 2011
Mitsui Assistant Professor of Geology, MIT, 2008 - 2010
Assistant Professor of Geology, MIT, 2007 – 2008
Research Associate and Senior Research Associate, Brown University, 2002-2006
Graduate student, MIT, 1997-2002
Lecturer in Mathematics, St. Mary's College of Maryland, 1995-1997
Principal, Business Plan Writing, Annapolis, MD, 1990-1995
Circulation Analyst, US News & World Report, Washington DC, 1989-1990
Interim Publisher, International Wine Review Magazine, Ithaca, NY, 1988-1989
Research Associate, Touche Ross & Co., Philadelphia, PA, 1987-1988

Publications (including review papers and book chapters)

Submitted

73. Pavlov, V., R. Veselovksiy, F. Fluteau, A. Latyshev, L. T Elkins-Tanton, Geomagnetic secular variations at the Permo-Triassic boundary and volcanic pulses in the Siberian traps, submitted.
72. Black, B.A., L.T. Elkins-Tanton, J.-F. Lamarque, C. Shields, J. Kiehl, Modeling the climate effects of volatile release by the Siberian flood basalts, submitted.

71. Ukstins Peate, I. and L.T. Elkins-Tanton, Large igneous provinces and explosive basaltic volcanism, submitted.
70. Scheinberg, A., L.T. Elkins-Tanton, S. Zhong, Timescale and morphology of Martian mantle overturn immediately following magma ocean solidification, submitted.
69. Fu, Roger R. and L. T. Elkins-Tanton, The fate of magmas in planetesimals and the retention 1 of primitive chondritic crusts, submitted.
68. Black, B.A., E.H. Hauri, L.T. Elkins-Tanton, Sulfur isotopic evidence for sources of volatiles in Siberian Traps magmas, submitted.

2013

67. Elkins-Tanton, L.T., Occam's origin of the Moon, Nature Geoscience (News and Views), 2013.
66. Black, B.A, J.-F. Lamarque, C. Shields, L. Elkins-Tanton, J. Kiehl, Acid rain and ozone depletion from pulsed Siberian Traps magmatism, accepted at Geology.
65. Erkaev, N. V., H. Lammer, L. Elkins-Tanton, P. Odert, K. G. Kislyakova, Yu. N. Kulikov, M. Leitzinger, M. Güdel, Escape of the martian protoatmosphere, Planetary and Space Science, DOI:http://dx.doi.org/10.1016/j.pss.2013.09.008, 2013.
64. Elkins-Tanton, L.T., Evolutionary dichotomy for rocky planets, Nature (News and Views), 2013.
63. Lammer H., M. Blanc, W. Benz, M. Fridlund, V. Coudé du Foresto, M. Güdel, H. Rauer, S. Udry, R.-M. Bonnet, M. Falanga, D. Charbonneau, R. Helled, W. Kley, J. Linsky, L. T. Elkins-Tanton, Y. Alibert, E. Chassefière, T. Encrenaz, A. P. Hatzes, D. Lin, R. Liseau, W. Lorenzen, S. N. Raymond, The Science of Exoplanets and their Systems. Astrobiology 13 (9) 793-813, 2013.
62. Elkins-Tanton, L.T., What makes a habitable planet? Eos, Transactions of the American Geophysical Union 94, 149-150, 2013.
61. Mandler, B.E. and L. T. Elkins-Tanton, The origin of eucrites, diogenites and olivine diogenites: magma ocean crystallization and shallow magma chamber processes on Vesta, Meteoritics & Planetary Science, 1–17, doi: 10.1111/maps.12135, 2013.
60. Vilim, R., S. Stanley, L. Elkins-Tanton, The effect of lower mantle metallization on magnetic field generation in rocky exoplanets, Astrophysical Journal Letters, 768, L30, doi:10.1088/2041-8205/768/2/L30, 2013.
59. Weiss, B.P. and L.T. Elkins-Tanton, Differentiated Planetesimals and the Parent Bodies of Chondrites, Annual Review of Earth and Planetary Sciences, 41, 21.1–21.32, DOI: 10.1146/annurev-earth-040610-133520, 2013.

2012

58. Johnson B.C., C.M. Lisse, C.H. Chen, H.J. Melosh, M.C. Wyatt, P. Thebault, W.G. Henning, E. Gaidos, L.T. Elkins-Tanton, J.C. Bridges, A. Morlok. A self-consistent model of the circumstellar debris created by a giant hypervelocity impact in the HD172555 system. Astrophysical Journal, 761, 45, doi:10.1088/0004-637X/761/1/45, 2012.
57. Suckale, J., L. Elkins-Tanton, and J. A. Sethian, Crystals stirred up: 2. Numerical insights into the formation of the earliest crust on the Moon, Journal of Geophysical Research, VOL. 117, E08005, doi:10.1029/2012JE004067, 2012.
56. Suckale, J., J.A. Sethian, J.-D. Yu, and L.T. Elkins-Tanton, Crystals stirred up: 1. Direct numerical simulations of crystal settling in nondilute magmatic suspensions, Journal of Geophysical Research, VOL. 117, E08004, doi:10.1029/2012JE004066, 2012.

55. Black, B.A., L.T. Elkins-Tanton, M.C. Rowe, I. Ukstins-Peate, Magnitude and Consequences of Volatile Release from the Siberian Traps, Earth and Planetary Science Letters 317-318, 363-373, 2012.

54. Elkins-Tanton, L.T., Magma oceans in the inner solar system, Annual Review of Earth and Planetary Sciences, 40, 113-139, 2012.

53. Zuber, M.T., H. Y. McSween, R.P. Binzel, L.T. Elkins-Tanton, A.S. Konopliv, C.M. Pieters, D.E. Smith, Origin, internal structure, and evolution of 4 Vesta, Space Science Reviews, DOI 10.1007/s11214-011-9806-8, p1 – 17, 2012.

2011

52. Weiss, B.J., L.T. Elkins-Tanton, M.A. Barucci, H. Sierks, C. Snodgrass, J.-B. Vincent, S. Marchi, M. Pätzold, I. Richter, P.R. Weissman, M. Fulchugnoni, R.P. Binzel, Possible evidence for partial differentiation of asteroid Lutetia from *Rosetta*, Planetary and Space Science, doi:10.1016/j.pss.2011.09.012, 137-146.

51. Suckale, J., B. H. Hager, L. T. Elkins-Tanton, and J. Nave, Reply to the comment by Mike R. James et al. on "It takes three to tango: 2. Bubble dynamics in basaltic volcanoes and ramifications for modeling normal Strombolian activity", J. Geophys. Res., 116, B06208, doi:10.1029/2011JB008351, 2011

50. Elkins-Tanton, L.T. and T.L. Grove, Water (hydrogen) in the lunar mantle: Results from petrology and magma ocean modeling, Earth and Planetary Science Letters 307, 173-179, 2011.

49. Gelman, S.E., L.T. Elkins-Tanton, and S. Seager, Mantle evolution in tidally locked terrestrial planets: Degree-1 convection and implications for habitability, The Astrophysical Journal 735, 1-8, DOI: 10.1088/0004-637X/735/2/72, 2011.

48. Elkins-Tanton, L.T., B.P. Weiss, M.T. Zuber, Chondrites as samples of differentiated planetesimals, Earth and Planetary Science Letters 305, 1-10, DOI: 10.1016/j.epsl.2011.03.010, 2011.

47. Carporzen L., B.P. Weiss, L. Elkins-Tanton, D.L. Shuster, D.S. Ebel, J. Gattacceca, Magnetic evidence for a partially differentiated carbonaceous chondrite parent body, Proceedings of the National Academy of Science, DOI:10.1073/pnas.1017165108e, 2011.

46. Elkins-Tanton, L.T., S. Burgess, and Qing-Zhu Yin, The lunar magma ocean: Reconciling the solidification process with lunar petrology and geochronology, Earth and Planetary Science Letters 304, 326-336, DOI: 10.1016/j.epsl.2011.02.004, 2011.

45. Elkins-Tanton, How much water does it take to be wet? Water on the Moon, invited Quick Study in *Physics Today*, March 2011.

44. Elkins-Tanton, L.T., Formation of early water oceans on rocky planets, Astrophysics and Space Science, 302(2), 359, DOI: 10.1007/s10509-010-0535-3, 2011.

2010

43. Bottke, W.F., R.J. Walker, J.M.D. Day, D. Nesvorny, L.T. Elkins-Tanton, Stochastic late accretion to Earth, the Moon, and Mars, Science 330, DOI 10.1126/science.1196874 , 1527-1530, 2010.

42. Ford, H.A., K. Fischer, D. Abt, C.A. Rychert, and L.T. Elkins-Tanton, The lithosphere–asthenosphere boundary and cratonic lithospheric layering beneath Australia from Sp wave imaging, Earth and Planetary Science Letters 300, 299-310, doi:10.1016/j.epsl.2010.10.007, 2010.

41. Till, Christy B, Linda T. Elkins-Tanton, and Karen M. Fischer, A mechanism for low extent melts at the lithosphere-asthenosphere boundary, Geochem. Geophys. Geosyst., 11, Q10015, doi:10.1029/2010GC003234, 2010.
40. Suckale, Jenny, Bradford Hager, Linda T. Elkins-Tanton, and Jean-Christophe Nave, It takes three to tango: 2. Bubble dynamics in basaltic volcanoes and ramifications for modeling normal Strombolian activity, Journal of Geophysical Research, 115, B07410, doi:10.1029/2009JB006917, 2010.
39. Meyer, Jennifer, Linda T. Elkins-Tanton, Jack Wisdom, Coupled thermal-orbital evolution of the early Moon, Icarus 208, 1-10, 2010.
38. Smrekar, Suzanne E., E.R. Stofan, N. Mueller, A. Treiman, L. Elkins-Tanton, J. Helbert, Recent hotspot volcanism on Venus from VIRTIS emissivity data, Science 328, 605-608, 2010.

2009

37. Miller-Ricci, E., M. Meyer, S. Seager, L. Elkins-Tanton, On the emergent spectra of hot protoplanet collision afterglows, Astrophysical Journal 704, 770-780, 2009.
36. Brown, S. and L. T. Elkins-Tanton, Composition of Mercury's oldest crust from magma ocean models, Earth and Planetary Science Letters 286, 446-455, 2009.
35. West, John D., Matthew J. Fouch, Jeffrey B. Roth, Linda T. Elkins-Tanton, Vertical mantle flow associated with a lithospheric drip beneath the Great Basin, Nature Geoscience 2, 438-443, 10.1038/NGEO526, 2009.
34. McCanta, M., L. Elkins-Tanton, M.J. Rutherford, Expanding the application of the Eu-oxybarometer to the lherzolitic shergottites and nakhlites: implications for the oxidation state heterogeneity of the Martian interior, Meteoritics and Planetary Science 44(5), 725-745, 2009.

2008

33. Weiss, B.P., J.S. Berdahl, L. Elkins-Tanton, S. Stanley, A. J. Irving, E.A. Lima, L. Carporzen, M.E. Zucolotto, Magnetism on the angrite parent body and the early evolution of planetesimals, Science 322, 713-716, 2008.
32. Elkins-Tanton L.T. and S. Seager, Coreless terrestrial exoplanets, Astrophysical Journal 688, 628-635, 2008.
31. Stanley, S., L. Elkins-Tanton, M. Zuber, and E.M. Parmentier, Mars' paleomagnetic field as the result of a single-hemisphere dynamo, Science 321, 1822-1825, 2008.
30. Elkins-Tanton L.T. and S. Seager, Ranges of atmospheric mass and composition for terrestrial exoplanets, Astrophysical Journal 685, 1237-1246, 2008.
29. Elkins-Tanton L.T., Linked magma ocean solidification and atmospheric growth for Earth and Mars, Earth and Planetary Science Letters 271, 181-191, 2008.
28. Adams E.R., S. Seager, L. Elkins-Tanton, Ocean planet or thick atmosphere: On the mass-radius relation for solid exoplanets with massive atmospheres, Astrophysical Journal 673, 1160-1164, 2008.
27. Farmer, G.L., T. Gailley, L.T. Elkins-Tanton, Mantle "source volumes" and the origin of the mid-Tertiary ignimbrite flare-up in the southern Rocky Mountains, Western U.S., Lithos 102, 279-294, 2008.

2007

26. Smrekar, S.E., L.T. Elkins-Tanton, J. Leitner, A. Lenardic, S. Mackwell, L. Moresi, C. Sotin, E.R. Stofan, Tectonic and thermal evolution of Venus and the role of volatiles:

Implications for understanding the terrestrial planets, *In* AGU monograph 176, Venus as a Terrestrial Planet, 45-71, 2007.

25. Cagnioncle, A., E. M. Parmentier, and L. T. Elkins-Tanton. Effect of solid flow above a subducting slab on water distribution and melting at convergent plate boundaries, Journal of Geophysical Research 112, B09402, doi:10.1029/2007JB004934, 2007.
24. Elkins-Tanton, L. T., S. E. Smrekar, P. C. Hess, and E. M. Parmentier, Volcanism and volatile recycling on a one-plate planet: Applications to Venus. Journal of Geophysical Research 112, E04S06, doi:10.1029/2006JE002793, 2007.
23. Elkins-Tanton, L. T., Continental magmatism, volatile recycling, and a heterogeneous mantle caused by lithospheric gravitational instabilities, Journal of Geophysical Research 112, B03405, doi:10.1029/2005JB004072, 2007.
22. Elkins-Tanton L.T., D. Draper, C. Agee, J. Jewell, A. Thorpe, P. Hess, The last lavas erupted during the main phase of the Siberian flood basalts: Results from experimental petrology, Contributions to Mineralogy and Petrology 153(2), doi:10.1007/s00410-006-0140-1, 191-209, 2007.
21. Barr, J., T.L. Grove, L. Elkins-Tanton, High-magnesian andesite from Mount Shasta: Aproduct of magma mixing and contamination, not a primitive melt: Comment and reply. Geology 35, p 147, doi: 10.1130/G24058C.1, 2007.

2006

20. Shearer C.K., P.C. Hess, M.A. Wieczorek, M.E. Pritchard, E.M. Parmentier, L.E. Borg, J. Longhi, L.T. Elkins-Tanton, C.R. Neal, I. Antonenko, R.M. Canup, A.N. Halliday, T.L. Grove, B.H. Hager, D.-C. Lee, U. Weichert, Thermal and magmatic evolution of the Moon, in New Views of the Moon, B.L. Joliff, M.A Wieczorek, C.K. Shearer, C.R. Neal, Eds, Reviews in Mineralogy and Geochemistry 60, Mineral. Soc. America, Chantilly, Virginia, 2006.

2005

19. Elkins-Tanton L.T., E.M. Parmentier, P.C. Hess, Possible formation of ancient crust on Mars through magma ocean processes, Journal of Geophysical Research 110, E12S01, doi:10.1029/2005JE002480, 2005.
18. Elkins-Tanton L.T. and B. H. Hager, Giant meteoroid impacts can cause volcanism, Earth and Planetary Science Letters, 239, 219-232, doi: 10.1016/j.epsl.2005.07.029, 2005.
17. Elkins-Tanton L.T., S. Zaranek, and E.M. Parmentier, Early magnetic field and magmatic activity on Mars from magma ocean overturn, Earth and Planetary Science Letters 236, 1-12, 2005.
16. Elkins-Tanton L.T., Continental magmatism caused by lithospheric delamination, in Plates, Plumes, and Paradigms, eds. G.R. Foulger, J.H. Natland, D.C. Presnall, D.L. Anderson, Geological Society of America, 449-461, 2005.
15. Grove T.L., M.B. Baker, R.C. Price, S.W. Parman, L.T. Elkins-Tanton, N. Chatterjee, and O. Müntener, Magnesian andesite and dacite lavas from Mt. Shasta, northern California: products of fractional crystallization of H2O-rich mantle melts. Contributions to Mineralogy and Petrology: DOI: 10.1007/s00410-004-0619-6, 2005.

2004

14. Elkins-Tanton L.T., B. H. Hager, and T.L. Grove, Magmatic effects of the Lunar Late Heavy Bombardment. Earth and Planetary Science Letters: 222, 17-27, 2004.

13. Kelly, D.C. and L.T. Elkins-Tanton, Bottle-green microtektites from the South Tasman Rise: Deep-sea evidence for an impact event near the Miocene/Pliocene boundary, Meteoritics and Planetary Science 39, 1921-1929, 2004.

2003

12. Elkins-Tanton L.T. and T.L. Grove, Evidence for deep melting of hydrous, metasomatized mantle: Pliocene high potassium magmas from the Sierra Nevadas, Journal of Geophysical Research: 108, 2350, DOI 10.1029/2002JB002168, 29 July 2003.
11. Elkins-Tanton L.T., P. Aussillous, J. Bico, D. Quéré, J.W.M. Bush, A laboratory model of splash-form tektites, Meteoritics and Planetary Science: 38, 1331-1340, 2003.
10. Elkins-Tanton L.T., E.M. Parmentier, and P.C. Hess, Magma ocean fractional crystallization and cumulate overturn in terrestrial planets: Implications for Mars, Meteoritics and Planetary Science: 38, 1753-1771, 2003.
9. Elkins-Tanton L.T., N. Chatterjee, and T.L. Grove, Magmatic processes that produced lunar fire fountains, Geophysical Research Letters: 30(10), p. 1513, DOI 10.1029/2003GL017082, 2003.
8. Grove T.L., L.T. Elkins-Tanton, S.W. Parman, N. Chatterjee, O. Müntener, G.A. Gaetani, Fractional crystallization and mantle-melting controls on calc-alkaline differentiation trends, Contributions to Mineralogy and Petrology: 145, p 515-533, DOI 10.1007/s00410-003-0448-z, 2003.
7. Elkins-Tanton L.T., N. Chatterjee, and T.L. Grove, Experimental and petrological constraints on lunar differentiation from the Apollo 15 green picritic glasses, Meteoritics and Planetary Science: 38, 515-527, 2003.

2002 and previous

6. Elkins-Tanton L.T., J. A. Van Orman, B. H. Hager, and T. L. Grove, Reexamination of the lunar magma ocean cumulate overturn hypothesis: Melting or mixing is required, Earth and Planetary Science Letters: 196, 249-259, 2002.
5. Elkins Tanton L.T., T.L. Grove, and J. Donnelly-Nolan, Hot shallow melting under the Cascades volcanic arc, Geology: 29, 631-634, 2001.
4. Elkins Tanton L.T. and Bradford H. Hager, Melt intrusion as a trigger for lithospheric foundering and the eruption of the Siberian flood basalt, Geophysical Research Letters: 27, 3937-3940, 2000.
3. Elkins L.T., T.L. Grove, J. Delano, V. Fernandez, Origin of lunar ultramafic green glasses: Constraints from phase equilibrium studies, Geochimica et Cosmochimica Acta: 64, 2339-2350, 2000.
2. Elkins, Linda T. and Timothy L. Grove, Ternary feldspar experiments and thermodynamic models, American Mineralogist: 75, 544-559, 1990.
1. Karig, D.E. and L.T. Elkins, Geology of the Cayuga Lake region, NYSGA Annual Meeting Guidebook, 1986.

Books

The Solar System, a six-book reference series, published by Chelsea House, an imprint of Facts on File, Inc, 1st edition 2006; 2nd edition 2010.

The Sun, Mercury, and Venus, The Earth and the Moon, Mars, Asteroids, Meteorites, and Comets, Jupiter and Saturn, Uranus, Neptune, Pluto, and the Outer Solar System

Invited talks

2013: Oxford University, UK (Astor Fellowship); ETH, Zurich; University of Maryland Astronomy Department; NAI Workshop without Walls: the Hadean Earth-Moon System; American Geophysical Union Fall Meeting (2 sessions); Johns Hopkins University; The Institute for Advanced Study at Princeton; The Applied Physics Laboratory; Lunar and Planetary Science Conference (Masurksy Lecture); University of Colorado; Workshop in Extinctions and Eruptions, London; Kongsberg Conference, Norway; Gordon Interiors of the Earth Conference, MA; Gordon Origin of the Solar Systems Conference, MA; Goldschmidt Conference, Florence; Origin of the Moon conference, London.

2012: Stonybrook; Johns Hopkins University (2012 Cloos Lectureship); U. British Columbia; Goddard Space Flight Center; EGU Vienna; Planetary Formation and Evolution Workshop at the Weizmann Institute Israel; Chapman conference Iceland; Planetary Climate conference Boulder; Life in the Cosmos, Smithsonian Institution; Bergamo Science Festival, Italy; BABEL conference Boston.

2011: American Geophysical Union Fall Meeting, University of Maryland, Geological Society of Washington, Goddard Space Flight Center, Carnegie Institution for Science (DTM), Hayden Planetarium, Yale University, Wellesley College, Woods Hole Oceanographic Institution, McGill University, IAVCEI/IUGG keynote in Melbourne

2010: University of Illinois at Champaign-Urbana, California Institute of Technology, Jet Propulsion Laboratory, Exoclimes conference at Exeter England, Planetary Formation workshop at Univ. Tokyo, Japan Geosciences Union Meeting (2 sessions), Princeton University, High Energy Density Laboratory Astrophysics Conference at CalTech, Southwest Research Institute, Northwestern University, Ludwig-Maximilians-Universität München, University of Michigan

2009: American Geophysical Union (2 sessions), AAS Div. Planetary Sciences, University of Massachusetts at Amherst, CIDER meeting (keynote speaker), University of Minnesota, Lehigh University, University of Oregon

2008: American Geophysical Union (2 sessions), Kavli Frontiers of Science NAS-France in Brittany, France, Origin and Evolution of Planets in Ascona, Switzerland, University of Iowa, Cornell University, University of New Mexico

2007: American Geophysical Union (1 session), University of Massachusetts at Amherst, NAGT "On the Cutting Edge" series

2006: Massachusetts Institute of Technology, Lunar and Planetary Institute, Stanford University ("Frontiers in Petrology" series), Brown University, Harvard University, Mt. Holyoke College, Chapman Venus Conference, University of Rhode Island

2005: Chapman Plume Conference, Scotland, Harvard University, California Institute of Technology, Massachusetts Institute of Technology, Brown University

2004: University of Massachusetts at Amherst, Harvard University, Carnegie Institute of Washington, DTM, Rice University, Wood's Hole Oceanographic Institute

2003 and before: Princeton University, University of Wisconsin at Madison, University of Chicago, EGS/AGU/EUG joint meeting, France, Wood's Hole Oceanographic Institute, Brown University

Postdoctoral, Graduate, and Undergraduate Researchers Supervised

Terrence Blackburn, Carnegie postdoctoral fellow 2012-2014, will begin tenure-track appointment at UC Santa Cruz in 2014

Scheinberg, Aaron, Ph.D. expected 2014, Mantle dynamics and geodynamos in the early solar system

Black, Ben, MIT Ph.D., 2013, Links between the volcanism and atmospheric chemistry, will postdoc at Berkeley starting January 2014

Suckale, Jenny, MIT Ph.D. 2011, Numerical models of bubbles and crystals in magmatic systems, now fellow at Harvard University, will begin tenure-track appointment at Stanford University in 2014.

Brown, Stephanie, MIT S.B. Thesis 2010, S.M. 2011, Dwornik Honorable Mention for best student presentation at LPSC 2008, now Ph.D. student at MIT

Wahl, Sean, MIT S.B. Thesis 2011, now Ph.D. student at Berkeley

Piskorz, Danielle, MIT S.B. 2011, now Ph.D. student at CalTech

Meyer, Romain, MIT Postdoctoral scholar 2008-2010, now researcher at U. Bergen

Gelman, Sarah, MIT S.B. Thesis, 2009, Goetze award for best thesis, now Ph.D. student at Univ. Washington and ETH

Thorpe, Andrew, B.S. Honors Thesis 2004 at Brown University

Jewell, Jessica, B.S. Honors Thesis 2004 at Brown University

Spacecraft mission proposal involvement

Psyche Discovery mission proposal, Principal Investigator (2012 -)

Mars 2020 Rover, science definition team member (2013)

SAGE Venus lander, New Frontiers proposal, lead: Larry Esposito; science team member (finalist for 2011 New Frontiers mission selection)

VERITAS Venus orbiter Discovery mission proposal, lead: Suzanne Smrekar; science team member (2010, 2013)

International Lunar Network, science definition team member (2008)

Honors and awards

Mineralogical Society of America Distinguished Lecturer, 2013-2014

Astor Fellow, Oxford University, 2013, including the first Lobanov Planetary Science Lecture

Masursky Lecture, Lunar and Planetary Science Conference, 2013

Cloos Lectureship, Johns Hopkins University, 2012

Asteroid (8252) Elkins-Tanton

Lowell Thomas Award from The Explorers Club, 2010

Outstanding MIT Faculty Undergrad Research Mentor Award, 2008-2009

Mitsui Career Development Chair, 2008-2011

NAS Kavli Fellow, Frontiers of Science, U.S. (participant), 2008

NAS Kavli Fellow, Frontier of Science France-US, France (speaker), 2008

National Science Foundation CAREER award, June, 2008

National Defense Science and Engineering Graduate fellowship, 1997-2000.

Amelia Earhart graduate fellowships from Xonta International, 1999 and 2000.

Service

Centre for Earth Evolution and Dynamics, Oslo, International Advisory Board Member

New Space Editorial Board founding member, 2012 –

Planetary Division of the American Geophysical Union, 2012-2014, President-Elect

NAS Committee on Astrobiology and Planetary Science (CAPS), 2012 –

Flag and Honors Committee, The Explorers Club, 2011 – 2013

Journal of Geophysical Research: Planets, 2010-2012, Associate Editor

Planetary Division of the American Geophysical Union, 2010 – 2012, Secretary

NAS Decadal Survey for Planetary Science, 2009-2010, Mars Panel Member

SENCR Microanalytical and Imaging Center Advisory Board, 2009 – 2010

Proposal reviewer for NASA, NSF, NOW (Netherlands), NERC (United Kingdom), ETH (Eidgenössische Technische Hochschule), DFG (Germany); service on numerous panels.

Research Contracts and Grants

NSF- ARI: Infrastructure for Interdisciplinary Research in Earth and Space Science at the Carnegie Institution. 9/1/2010 – 9/1/2014.

NSF CSEDI Collaborative Research: Application of siderophile elements to mantle geodynamics. Co-I with lead P.I. Rich Walker at University of Maryland. 5/1/2012 – 4/30/2016.

Canada-France-Hawaii Telescope: Signatures of rocky planets in the atmospheres of planet-hosting stars. Collaborator with lead P.I. Luca Fossati, The Open University.

NASA Planetary Instrumentation Development, ASGARD: Development of a seismometer for planetary applications. Co-I. with lead P.I. Draper Labs, 6/1/10 – 5/30/13.

NSF EAR Instrumentation and Facilities, Upgrade of the Alliance for Computational Earth Science (ACES) High Performance Computing Facility. Co-I. with lead P.I. Brad Hager, MIT, 5/1/10 – 4/30/11.

MIT Research Funds, Catastrophes, tedium, discoveries: When expeditions do science. Co-I with P.I. Mary Fuller.

NASA LASER program, Lunar volatiles and magma ocean differentiation: Reconciling new results with old ideas, Co-I. with P.I. Molly McCanta, Tufts University, 7/1/09 – 6/30/12.

NASA Lunar Institute, Moon as cornerstone to the terrestrial planets: The formative years. Team member with P.I. Carle Pieters, Brown University, and Institutional P.I. Maria Zuber, MIT.

MIT Research grant from the Wade fund, Unusual lavas in Arctic Siberia: Connections to the world's largest volcanic event, the world's largest extinction, and river channels on Venus. P.I.. 7/1/08 – 6/30/09.

NSF Continental Dynamics, Collaborative research: The Siberian Traps and the end-Permian extinction: Coincidence and causality. Lead P.I., 8/1/08 – 7/31/13.

NSF Astronomy, CAREER: Building rocky planets: From Mercury and Vesta to GL 581c. P.I., 3/7/08 – 5/31/13.

NASA Mars Fundamental Research, The role of water in the early formation of Mars: Wet magma ocean crystallization, the growth of a water atmosphere, and retention of water in the mantle. P.I., 6/1/06 – 1/31/11.

NSF Continental Dynamics, Collaborative research: Lithospheric removal: The Sierra Nevada as the prototype of a fundamental process in mountain building. P.I., 9/1/06 – 8/31/10.

Strategic University Research Partnership, MIT-JPL, Consequences of tidal heating on the internal evolution of the early Earth, with comparison to Venus, Mars, and Mercury. 7/1/08-6/30/09.

NSF Geophysics, The lithosphere-asthenosphere boundary: Integrated modeling of scattered wave observations and mantle dynamics. Co-I. with P.I. K. Fischer, 4/1/06 – 3/31/09.

NSF Continental Dynamics, Workshop on the Siberian traps and the end-Permian extinction. P.I., 9/1/05 – 12/31/06.

NASA Mars Fundamental Research, Early crustal formation on Mars. P.I., 7/1/05 – 12/31/06.

NASA Mars Fundamental Research, Petrology and physics of magma ocean crystallization. P.I., 4/1/04 – 3/31/05.

NSF Petrology and Geochemistry, Lithospheric controls on flood basalt volcanism. P.I., 7/1/03 – 12/1/05

Papers presented at conferences

1. Elkins, Linda T. and Timothy L. Grove, Phase equilibrium investigations of ternary feldspars, Geological Society of America Abstracts, 1987.
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