1. **Stephen W. Parman**
Associate Professor
Dept. of Earth, Environmental and Planetary Sciences
324 Brook St
Box 1846
Providence, RI 02912

2. 139 Lorimer Ave, Providence, RI 02906

3. **B.A.** Harvard University, 1994 in Earth and Planetary Sciences
Ph.D. Massachusetts Inst. of Technology, 2001 in Geology and Geochemistry
(thesis topic: Petrology and Geochemistry of High-Degree Mantle Melts)

4.

2015-present	Associate Professor	Brown University	(USA)
2008-2015	Assistant Professor	Brown University	(USA)
2005-2008	Lecturer	Durham University	(UK)
2004-2005	Postdoctoral Researcher	Harvard University	(USA)
2001-2002	Adjunct Lecturer	Boston University	(USA)
2001-2004	Postdoctoral Researcher	MIT	(USA)

5.a. Peer Reviewed Articles (*italics indicate advisee or co-advisee, * indicates postdoc*)

[54] Lark L.H., Parman S.W., Huber C., Parmentier E.M. and Head J.W. (2022) Sulfides in Mercury's mantle: implications for Mercury's interior as interpreted from moment of inertia. Geophys Res Lett 49: e2021GL096713. https://doi.org/10.1029/2021GL096713

[53] Mouser M.D., Dygert N., *Anzures B.A.*, Grambling N.L., Hrubiak R., Kono Y., Shen G. and Parman S.W. (2021). Experimental investigation of Mercury's magma ocean viscosity: Implications for the formation of Mercury's cumulate mantle, its subsequent dynamic evolution, and crustal petrogenesis. J Geophys Res: Planets, 126, e2021JE006946. https://doi.org/10.1029/2021JE006946

[52] Deutsch A.N., Head J.W., Parman S.W., Wilson L., Neumann G.A. and Lowden F. (2021) Degassing of volcanic extrusives on Mercury: potential contributions to transient atmospheres and buried polar deposits. Earth Planet Sci Lett 564: 116907, doi.org/10.1016/j.epsl.2021.116907.

[51] Nagaoka Y., Suda M., Yoon M., Chen N., Yang H., Liu Y., *Anzures B.*, Parman S.W., Wang Z., Grünwald M., Yamamoto H. and Chen O (2021). Bulk grain-boundary materials from nanocrystals. Chem 7: 509-525.

[50] *Anzures B.A.*, Parman S.W. Milliken R., Lanzirotti A. and Newville M. (2020) Effect of sulfur speciation on chemical and physical properties of very reduced mercurian melts. Geochm Cosmochim Acta 286: 1-18.

[49] Schaible, M.J., Sarantos M., *Anzures B.A.*, Parman S.W. and Orlando T.M. (2020) Photon-stimulated desorption of MgS as a potential source of sulfur in Mercury's exosphere. JGR Planets 125: e2020JE006479. https://doi.org/ 10.1029/2020JE006479

[48] *Anzures B.A.*, Parman S.W., Milliken R., Lanzirotti A. and Newville M. (2020) XANES spectroscopy of sulfides stable under reducing conditions. Amer Min 105: 375-381.

[47] *Krantz J.A.*, Parman S.W. and Kelley S.P. (2019) Recycling of heavy noble gases by subduction of serpentinite. Earth Planet Sci Lett 521: 120-127.

[46] *Cukjati J.T.*, Cooper R.F., Parman S.W., Zhao N., Akey A.J. and Laiginhas F.A.T.P (2019) Differences in chemical thickness of grain and phase boundaries: an atom probe tomography study of experimentally deformed wehrlite. Phys Chem Min 46: 845-859.

[45] Boukaré C-E*, Parmentier E.M., Parman S.W. and *Anzures B.A.* (2019) Production and preservation of sulfide layering in Mercury's mantle. JGR-Planets 121: https://doi.org/10.1029/2019JE005942.

[44] Boukaré C-E*, Parmentier E.M. and Parman S.W. (2018) Timing of mantle overturn during magma ocean solidification. Earth Planet Sci Lett 491: 216-225.

[43] Cannon KM, Parman SW and Mustard JF (2017) Primordial clays on Mars formed beneath a steam or supercritical atmosphere. Nature 552: 88-91.

[42] Cannon KM, Mustard JF, Parman SW, Sklute ED, Dyar MD, Cooper RF (2017) Spectral properties of Martian and other planetary glasses and their detection in remotely sensed data. JGR-Planets 122:249-268.

[41] Smye AJ, *Jackson CRM*, Konrad-Schmolke M, Hesse MA, Parman SW, Shuster DL, Ballentine CJ (2017) Noble gases recycled into the mantle through cold subduction zones. Earth Planet Sci Lett 471: 65-73.

[40] Waterton P, Pearson DG, Kjarsgaard B, Hulbert L, Locock A, Parman SW and Davis B (2017) Age, origin, and thermal evolution of the ultra-fresh ~1.9Ga Winnipegosis Komatiites, Manitoba, Canada. Lithos 268: 114-130.

[39] *Prissel TC*, Whitten JL, Parman SW and Head JW (2016) On the potential for lunar highlands Mg-suite extrusive volcanism and implications concerning crustal evolution. Icarus 277:319-329.

[38] *Prissel TC*, Parman SW and Head JW (2016) Formation of lunar highlands Mg-suite as told by spinel. Amer Min 101: 1624-1335.

[37*] Williams KB, Jackson CRM*, Cheeks LC, Donaldson-Hanna KL, Parman SW, Pieters CM, Dyar MD and *Prissel TC* (2016) Reflectance spectroscopy of chromium-bearing spinel with application to recent orbital data from the Moon. Amer Min 101:726-734.

[36] *Jackson CRM*, Shuster DL, Parman SW and Smye AJ (2016) Noble gas diffusivity hindered by low energy sites in amphibole. Geochim Cosmochim Acta 172: 65-75.

[35] Starkey NA, *Jackson C*, Greenwood RC, Parman SW, Franchi IA, Jackson M, Fitton JG, Stuart FM, Larsen LM and Kurz M (2016) Triple oxygen isotopic composition of the high $^{3}He/^{4}He$ mantle. Geochim Cosmchim Acta 176: 227-238.

[34] Parman S (2015) Time-lapse zirconography: imaging the punctuated evolution of the continental crust. Geochemical Perspectives Letters 1: 43-52.

[33] *Jackson C*, Parman S, Kelley S and Cooper R. (2015) Light noble gas dissolution into ring structure-bearing minerals and lattice influences on noble gas recycling. Geochim Cosmochim Acta 159: 1-15.

[32] Parman S, Diercks D, Gorman B and Cooper R (2015) Atom probe tomography of isoferroplatinum. Amer Mineral 100: 852-860.

[31] Roberts N, Van Kranendonk M, Parman S and Clift p (2014) Continent formation through time. In: Roberts N, Van Kranendonk, M, Parman S and Clift P, Geological Society, London, Special Publications, 389: 1-16.

[30] Pieters C, Donaldson Hanna K, Cheek L, Dhingra D, *Prissel T, Jackson C*, Moriarty D, Parman S, Taylor L (2014) The distribution of Mg-spinel across the Moon and constraints

on crustal origin. Amer Mineral, 99: 1893-1910.

[29] *Jackson C*, Cheek L, Williams K, Donaldson Hanna K, Pieters C, Parman S, Cooper R, Dyar D, Nelms M, Salvatore M (2014) Visible-infrared spectral properties of iron- bearing aluminate spinel under lunar-like redox conditions. Amer Mineral, 99: 1821-1833.

[28] *Prissel T*, Parman S, *Jackson C*, Rutherford M, Hess P, Head J, Cheek L, Dhingra D and Pieters C (2014) Pink Moon: The petrogenesis of pink spinel anorthosites and implications concerning Mg-suite magmatism. Earth Planet Sci Lett, 403: 144-156.

[27] *Jackson C*, Parman S, Kelley S and Cooper R. (2013b) Noble gas transport into the mantle facilitated by high solubility in amphibole. Nature Geoscience 6, 562-565.

[26] *Jackson C*, Parman S, Kelley S and Cooper R. (2013a) Light noble gas partitioning at the conditions of spinel-peridotite melting. Earth Planet Sci Lett, 384: 178-187.

[25] *Coggon J*, Nowell G, Pearson D, and Parman S (2012), The ^{190}Pt-^{186}Os decay system applied to dating platinum-group mineralization of the Bushveld Complex. Chemical Geology 302: 48-60.

[24] *Coggon J*, Nowell G, Pearson D, and Parman S (2011), Application of the ^{190}Pt-^{186}Os isotope system to dating platinum mineralisation and ophiolite formation - An example from the Meratus Mountains, Borneo. Economic Geology, *106: 93-117*.

[23] Cooper S, Plank T, Arculus R, Hauri E, Hall P, and Parman S (2010) High-Ca Boninites from the active Tonga arc. J Geophys Res 115, article number B10206, doi: 10.1029/2009JB006367.

[22] Parman S, Grove T, Kelley K, and Plank T (2010) Along-Arc Variations in the Pre-Eruptive H_2O Contents of Magmas Inferred from Fractionation Paths. J Petrology, doi: 10.1093/petrology/egq079.

[21] Kelley K, Plank T, Newman S, Stolper E, Grove T, Parman S, and Hauri E (2010) Mantle melting as a function of water content beneath the Mariana arc. J Petrology, 52: 257-278.

[20] Luguet A, Pearson DG, Nowell GM, Dreher ST, *Coggon JA*, Spetsius ZV and Parman SW (2008). Enriched Pt-Re-Os isotope systematics in plume lavas explained by metasomatic sulfides. Science 319: 453-456.

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[16] Parman SW (2007) Helium Isotopic Evidence for Episodic Mantle Melting and Crustal Growth. Nature, 446: 900-903.

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[9] Grove TL, and Parman SW (2004) Thermal evolution of the Earth as recorded by komatiites. Earth Planet Sci Lett 219, 173-187, doi:10.1016/S0012-821X(04)00002-0.

[8] Parman SW, Grove TL and Dann JC (2004) A subduction origin for komatiites and cratonic lithospheric mantle. South Afr J Geol 107, 107-118.

[7] Parman SW and Grove TL (2004) Harzburgite melting with and without H_2O: Experimental data and predictive modeling. J Geophys Res 109, B02201, doi: 10.1029/2003JB002566

[6] Grove TL, Elkins-Tanton LT, Parman SW, Chatterjee N, Muentener O, Gaetani G (2003) Mantle melting controls on calc-alkaline differentiation trends. Contrib Mineral Petrol 145, 515-533.

[5] Parman SW, Shimizu N, and Grove TL (2003). Constraints on the pre-metamorphic trace element composition of Barberton komatiites from ion probe analyses of preserved clinopyroxene. Contrib Mineral Petrol 144, 383-396.

[4] Grove TL, Parman SW, Bowring SA, Price RC, and Baker MB (2002*)* The role of an H_2O-rich fluid component in the generation of primitive basaltic andesites and andesites from the Mt. Shasta region, N California. Contrib Mineral Petrol 142, 375-396.

[3] Parman, SW, Grove TL, and Dann JC (2001) The production of Barberton komatiites in an Archean subduction zone. Geophys Res Lett 28, 2513-2516.

[2] Grove TL, Parman SW, and Dann JC (1999) Conditions of magma generation for Archean komatiites from the Barberton Mountainland, South Africa. In *Mantle Petrology: Field Observations and High Pressure Experimentation: A tribute to Francis R. (Joe) Boyd*. The Geochemical Society, Special Publication 6, Y Fei, C.M. Bertka and B.O. Mysen, eds., pp. 155-167.

[1] Parman SW, Dann JC, Grove TL and de Wit MJ (1997) Emplacement conditions of komatiite magmas from the 3.49 Ga Komati formation, Barberton Greenstone Belt, South Africa. Earth Planet Sci Lett 150, 303-323.

Non peer reviewed articles

Parman SW (2018) An Archean mushy mantle. Nature Geoscience 11: 85-86. doi.org/10.1038/s41561-018-0060-5

Parman SW (2015) Going small: nanoscale geochronology using atom probe tomography. Amer Mineral 100: 1333-1334. doi.org/10.1038/s41561-018-0060-5

5.b. Selected Abstracts (** indicates undergraduate advisee)

Nelson W, Hammer J, Parman S, Akey A. (2022) Atom by Atom: Investigating phosphorus in olivine using atom probe tomography. Goldschmidt Conference.

Lark L, Huber C, Head JW, Parman SW and Parmentier EM (2021) Sulfides in Mercury's mantle: implications for Mercurys interior as interpreted from moment of intertia. AGU Fall meeting: abstract 2223.

Cukjati J, Cooper R, Parman S, Zhao N, Akey A, and Laiginhas F (2021) Heterophase boundaries, chemical-mechanical potentials, plastic instability and trace-element behavior in upper-mantle assemblages: application of atom probe tomography to the understanding of crystal-boundary dynamics. Goldschmidt.

Cukjati, J., Cooper, R., Parman, S., Zhao, N., Akey, A., and Laiginhas, F. (2021): Atom probe as a tool for understanding mineral physics and rock deformation: a case study of deformed wehrlite, EGU 2021: abstract 6581.

Head JW, Wilson L, Parman SW, Jozwiak LM and Deutsch AN (2021) Modeling dike emplacement and pyroclastic eruptions on Mercury: implications for volatile sources, abundances and fates. MExAG meeting: abstract 6051.

Parman SW, *Anzures Ba, Cukjati JT*, Cooper RF, Dygert N, Mouser MD and Ohldag H (2021) Silicon bonding in Mercury's mantle. MExAG meeting: abstract 6029.

Parman SW, Evans AJ, Alvarez E**, Weller MB, Reinhard CT, Ibarra DE and Anzures BA (2021) Assessing the abundance of super-Mercuries and their habitability. LPSC 52:abstract 2548.

Anzures BA, Parman SW, Milliken RE, Namur O, and Cartier C (2021) Sulfide speciation in mercurian magmas. LPSC 52: abstract 2238.

Mouser M, Dygert N, *Anzures BA*, Grambling NL, Hrubiak R, Kono Y, Shen G, Parman SW. (2021) Viscosity of the Mercurian Magma Ocean: Implications for the Mineralogical Stratigraphy of Mercury's Juvenile Mantle and Crustal Petrogenesis. AGU Fall Meeting: abstract P088-05.

Deutsch A, Head J, Parman SW, Wilson L, Neumann G, Lowden F (2020) The mass flux of volatiles from volcanic eruptions on Mercury. EGU General Assembly Conference: p. 3742.

Anzures BA, Parman SW, Boesenberg JS and Milliken RE (2020) Volatile (S, C, F, Cl) Contents of Enstatite in Reduced Meteorites as Indicators of Oxygen Fugacity and Volatile Conditions in the Early Solar Nebula. LPSC 51: abstract 1207.

Deutsch AN, Head JW, Parman, SW, Wilson L, Neumann GA and Lowden F (2020) The Mass Flux of Volatiles from Effusive Eruptions on Mercury. LPSC 51: abstract 1207. 2326.

Mouser MD, Dygert N, Hrubiak R, Kono Y, Shen G, *Anzures BA*, Grambling NL and Parman SW (2020) Viscosity of the Mercurian Magma Ocean: Implications of Sulfur-Free and Sulfur-Bearing Magma Oceans for Differentiation and Crustal Petrogenesis. LPSC 51: abstract 2098.

Parman SW, Evans AJ, Weller MB, Reinhard CT, Ibarra DE, First EC and *Anzures BA* (2020) Abundance and habitability of super-Mercuries. LPSC 51: abstract 1999.

Parman SW, Akey AJ and Saal AE (2020) Nanoanalysis of pristine lunar orange glass bead surfaces. LPSC 51: abstract 2566.

Anzures BA, Parman SW, Boesenberg JS and Milliken RE (2019) Using volatile (S, C, H, F, Cl) contents of enstatite in reduced meteorites to estimate oxygen fugacity and equilibrium melt compositions. LPSC 50: abstract 2179.

Parman SW, Jacobsen SB, Petaev MI and Akey AJ (2019) Atom probe tomography of opaque assemblage in Allende CAI. LPSC 50, abstract 2890.

Mouser, MD, Dygert N, Grambling NL, *Anzures BA*, Kono Y, Shen G and Parman S (2019) Viscosity of the Mercurian magma ocean: implications for crystal fractionation and crustal petrogenesis. LPSC 2019, abstract 2030.

Boukaré, CE, Parmentier EM and Parman SW (2019) Imposed surface heat flux does not necessarily control magma ocean solidification timescale. LPSC 2019, abstract 2291.

5.c. Papers in Progress

Krantz J., Barry P.H., Bekaert D.V., and Parman S.W. (2022) Tracing mantle regassing and the onset of subduction using combined H, N, and Xe systematics. Earth Planet Sci Lett – in revision.

Anzures BA, Parman SW, Milliken RE, Namur O, and Cartier C (2022) Sulfide speciation in mercurian magmas (in prep).

5.d. Edited Books

Roberts N, Van Kranendonk, M, Parman S and Clift P (2014) Continent Formation Through Time. Geological Society London, Special Publications, 389.

6.a. Current Research Grants

The differentiation of Mercury's magma ocean: integrating geodynamics and geochemistry.

Funding Agency: NASA – Emerging Worlds
Description: Collaborative project with Prof Chris Huber
PI: Stephen Parman, CoIs: Chris Huber and Marc Parmentier.
Proposed dates: 1/1/2022 – 12/31/2024
Award Amount: $835,120

Grain and Phase Boundaries in Mantle Assemblages: Atom Probe and Electron Microscopy/Diffraction Approaches

Funding Agency: NSF
Description: My EAGER ($82,000) proposal was combined with this proposal, which I was already a PI on. This grant will build on our groundbreaking work using the atom probe to understand grain boundaries in geoscience.
PI: R Cooper (Brown Univ.)
Co-I: S Parman (Brown Univ.)
Active Dates: 2020-203
Award Amount: $514,493

Life Beyond Earth: Determining the Habitability of Exoplanets

Funding Agency: Brown University SEED fund

Description: The funds will allow us to establish a modeling framework to estimate habitability of exoplanets by linking existing expertise at Brown in both planetary interior evolution and atmosphere evolution. Will lay the groundwork for future NASA exoplanet proposals.
PI: Alex Evans (Brown Univ.)
Co-I: S Parman, D Ibarra, G Tucker (Brown Univ.)
Active Dates: 2022-23
Award Amount: $90,000

Brown University electron microprobe facility
Funding Agency: NASA – PSEF
Description: Funding for 50% of cost to replace existing instrument in Brown core facility.
PI: Stephen Parman
CoIs: Ralph Milliken, Greg Hirth, Yan Liang, John Mustard, Alberto Saal, Joseph Boesenberg, Reid Cooper, Gerrit Budde, Daniel Ibarra and Malcolm Rutherford (all at Brown).
Proposed dates: 3/3/2023 – 3/2/2027
Award Amount: $581,576

REU Site: Dynamic Earth in the 21st Century: Undergraduate Research on the Evolution of Earth's Interior, Surface and Climate
Funding Agency: NSF - REU
Description: This REU site focuses on providing well-mentored 9-week summer research experiences to underrepresented undergraduates from outside of Brown, helping them to develop their research and science communication skills, and improving their understanding of pathways to graduate school and careers in geoscience. The REU is a collaboration between the Brown University Department of Earth, Environmental and Planetary Sciences and the Leadership Alliance.
PI: Karen Fischer
CoI: Taiese Bingham-Hickman
Senior Personnel: Stephen Parman, Meredith Hastings, Dan Ibarra, Yan Liang, Tim Herbert, Jung-Eun Lee, Chris Huber, Colleen Dalton, Alex Evans, James Russell
Proposed dates: 1/2023 – 12/2025

6.b. Completed Research Grants

Collaborative Research: Tracking the exsolution and migration of volatiles in shallow magma reservoirs
Funding Agency: NSF
Description: This proposal looks at how magmatic systems degas volatiles.
PI: C Huber (Brown Univ.)
Co-I: S Parman (Brown Univ.)
Active Dates: 2018-2021
Award Amount: $274,218

Volatile Partitioning at very low oxygen fugacity

Funding Agency: NASA

Description: This is a graduate fellowship for Brendan Anzures. He will analyze the volatile content of minerals in natural samples and experiments to understand the volatile distribution in the early solar system.

PI: S Parman (Brown Univ.)

Active Dates: 2018-2021

Award Amount: $135,000

SSERVI Evolution and Environment of Exploration Destinations: Science and Engineering Synergism (SEEEDS)

Funding Agency: National Aeronautics and Space Administration - Solar System Exploration Research Virtual Institute (SSERVI)

Description: This is a large collaborative virtual institute held jointly between Brown and MIT. The remit is to conduct research on the Moon, the moons of Mars and near Earth asteroids.

PI: C Pieters (Brown Univ.)

CoIs: S Parman (Brown Univ.) + 21 other CoIs

Active Dates: 2014 - 2019

Award Amount: $5,553,000

Primary Differentiation of Mercury's Interior

Funding Agency: National Aeronautics and Space Administration - Emerging Worlds Program

Description: Funds will be used to measure the crystallization sequence of the Mercurian magma ocean and then to model the sinking or floating of the crystals using numerical models

PI: S Parman (Brown Univ.)

CoIs: M Parmentier (Brown Univ.)

Active Dates: 2015 - 2018

Award Amount: $608,809

Tracing Volatile Cycles with Noble Gases: Experimental Measurement of Noble Gas Solubility in Subducting Minerals

Funding Agency: National Science Foundation - Division of Earth Sciences - Petrology and Geochemistry Program

Description: Proposed work will measure the solubility of noble gases in a range of minerals that are prevalent in subducting oceanic crust and mantle. The results will constrain the rate of noble gas recycling and the fractionations recycling produces between the different noble gases.

PI: S Parman (Brown Univ.)

CoIs: S Kelley (Open Univ.)

Active Dates: 2014 - 2017

Award Amount: $299,000

Extended Defects in Olivine and Their Impact on Diffusive Reaction Kinetics

Funding Agency: National Science Foundation - Division of Earth Sciences - Petrology and Geochemistry Program
Description: Proposed work will study the formation and effects of extended defects in olivine
PI: R Cooper (Brown Univ.)
CoIs: S Parman (Brown Univ.)
Active Dates: 2012 - 2016 (with no cost extension)
Award Amount: $389,473

Electron Microprobe Facility Upgrade

Funding Agency: Brown University - Core Infrastructure Award
Description: Funds will be used to upgrade existing 10 year old electron microprobe, including improved electron source, imaging capabilities, beam location and software.
PI: S Parman (Brown Univ.)
CoIs: Y Liang (Brown Univ.), J Boesenberg (Brown Univ.)
Active Dates: 2014 - 2015
Award Amount: $101,878

Experimental Study of Noble Gas Behavior in the Mantle

Funding Agency: National Science Foundation - Division of Earth Sciences - Petrology and Geochemistry Program
Description: Proposed work will measure the solubility of noble gases in a range of mantle minerals that are relevant to melting at mid-ocean ridges. The data will be used to determine the noble gas composition of melts and their residues, and to interpret the noble gas isotopic evolution of the mantle.
PI: S Parman (Brown Univ.)
CoIs: S Kelley (Open Univ.)
Active Dates: 2010 - 2014
Award Amount: $350,000

Noble Gas Fractionation During Degassing: a proof-of-concept high-pressure experimental study

Funding Agency: National Science Foundation - Division of Earth Sciences - Ocean Sciences Program
Description: Proposed work experimentally measured the fractionation of noble gases during degassing of mid-ocean ridge basalts. The data was used to estimate the extent of degassing during eruption and the amount of major volatiles, including the greenhouse gas carbon dioxide.
PI: S Parman (Brown Univ.)
Active Dates: 2010 - 2011
Award Amount: $57,000

Purchase of a Laser-Ablation Multicollector ICP-MS

Funding Agency: National Science Foundation - Major Research Instrumentation

Description: Funds were used to purchase 1) a multicollector ICP-MS for the measurement of isotopic ratios in geologic samples, 2) a quadrupole-MS for the measurement of trace element concentrations in geologic samples and 3) a laser-ablation system for micro-sampling.
PI: A Saal (Brown Univ.)
CoIs: S Parman (Brown Univ.), M Hastings (Brown Univ.), S Porder (Brown Univ.), J Russell (Brown Univ.), J Whiteside (Brown Univ.), M Wyatt (Brown Univ.)
Active Dates: 2009 - 2010
Award Amount: $700,000

Atom Probe Tomography of Geological Materials
Funding Agency: Brown University - Salomon Award
Description: Funds were used to explore the use of the atom probe for the analysis of complex, geological materials.
PI: S Parman (Brown Univ.)
CoIs: R Cooper (Brown Univ.)
Active Dates: 2010 - 2011
Award Amount: $14,900

Did Catastrophic Melting Events Dominate the Early Evolution of the Atmosphere, Oceans and Solid Earth?
Funding Agency: Natural Environment Research Council (UK)
Description: Funds were used to measure the osmium isotopic composition of platinum alloy grains and relate the data to melting events in the Earth's mantle. The age of the melting events correlated with pulses of crustal growth, indicating a punctuated evolution for the Earth.
PI: S Parman (Durham Univ.)
CoIs: DG Pearson (Durham Univ.), G Nowell (Durham Univ.)
Active Dates: 2007 - 2010
Award Amount: $1,004,000

Noble Gas Partitioning Experiments
Funding Agency: Natural Environment Research Council (UK)
Description: Funds were used to make initial measurements of noble gas solubilities in olivine at mantle pressures.
PI: S Parman (Durham Univ.)
CoIs: S Kelley (Open Univ., UK), C Ballentine (Manchester Univ., UK)
Active Dates: 2008 - 2009
Award Amount: $80,000

Development of Methods to Measure Noble Gas Partitioning at Mantle Pressures
Funding Agency: European Science Foundation - Infrastructure Access Grant (access to Bayreuth Geoinstitut experimental facilities)
Description: Funds were used to develop experiment methods necessary to measure the solubility of noble gases in mantle minerals at relevant high pressures and temperatures
PI: S Parman (Durham Univ.)

CoIs: C McCammon (Univ. Bayreuth, Germany), D Frost (Univ. Bayreuth, Germany)
Active Dates: 2007
Award Amount: 5 weeks of experimental time, including materials

Melting Processes in Infant Subduction Zones: high field-strength element fractionation in boninites

Funding Agency: Natural Environment Research Council (UK) - New Investigator Award
Description: Funds were used to measure the fractionation of high field-strength elements between orthopyroxene and boninitic melts.
PI: S Parman (Durham Univ.)
CoIs: K Kelley (Univ. Rhode Island)
Active Dates: 2006 - 2009
Award Amount: $80,000

Experimental Investigation of Noble Gas Partitioning

Funding Agency: Nuffield Foundation (UK)
Description: Funds were used to make initial measurements of noble gas solubilities in olivine at mantle pressures.
PI: S Parman (Durham Univ.)
Active Dates: 2005 - 2006
Award Amount: $10,000

6.c. Submitted Proposals

Lunar Structure, Composition and Processes for Exploration LunaSCOPE

Funding Agency: NASA – SSERVI
Description: Large, multi-institutional project to study the Moon
PI: Alex Evans
Deputy PIs: Stephen Parman and Jack Mustard
Proposed dates: 7/1/2023 – 6/30/2028
Award Amount: $7,500,000

Unraveling the role of KREEP during the initial stages of secondary crust building on the Moon

Funding Agency: NASA – ANGSA
Description: Analysis of Apollo samples recently made available. My part is to do the nanoanalyses.
PI: Tabb Prissell (NASA JSCC)
CoIs: Stephen Parman, Julia Hammer, Thomas Shea, Juliane Gross, Charles Shearer, Austin Akey, Carloyn Crow, William Nelson, Timmons Erickson, Stephen Elardo
Proposed dates: 7/1/2023 – 6/30/2026
Award Amount: $53,697

7.a. Service to Brown University

2020-present	Faculty Hearing Committee for Allegations on Gender-based Discrimination (elected)
2020-present	DEEPS Resources Committee
2021-present	DEEPS Colloquium Committee
2020-present	University Lab Safety Committee
2020-present	DEEPS Core Facility and Safety
2020	Participant: '*STEM Engagement with K-12 Education*' learning community of the Swearer Center
2018-2019	Stocks and Shops Committee
2015-2017	Chair, DEEPS Curriculum Committee
2005-present	Director of Electron Microscope Facility
2014-present	Office Space Czar - Ground Floor GeoChem building
2009-present	Freshman advisor - 4 to 6 students per year
2011-2012	Search committee - Remote Sensing of Planetary Surfaces position
2010-2011	Search committee - Early Solar System position
2009-2010	Chaired hiring committee for electron microprobe technician
2009-2010	Chaired hiring committee for departmental machinist

7.b. Service to the profession

2022-present	Steering Committee – Mercury Exploration Assessment Group (MExAG)
2022-present	Organizing Committee – NASA-SMD Technology Showcase Meeting
2019-present	Leadership Alliance Mentor – 4 students mentored to date
2018-2022	Editor, Journal of Geophysical Research - Solid Earth
2018-2021	Strategic Planning Committee, Geochemical Society
2015-2020	Board Member, Geochemical Society
2015-2018	Chair, Organizing Committee, 2018 Goldschmidt Meeting, Boston
2011-2018	Associate Editor for Journal of Geophysical Research - Solid Earth
2012	NSF-CSEDI review panel
2013, 2015	NASA review panel
2004-present	Regular reviewer for NASA SSW and EW programs, NSF EAR
2004-present	Regular reviewer for Nature, Science, EPSL, J Petrology, Amer Min, GCA

Recent Invited talks at other universities

2019	Geophysical Laboratory	(Washington, D.C.)
2018	Curtin University	(Perth, AU)
2018	University Western Australia	(Perth, AU)
2016	SUNY Stony Brook	(Stony Brook, NY)
2015	Witswatersrand University	(Johannesburg, SA)
2014	University of Pennsylvania	(Philadelphia, PA)

2012	University of Colorado	(Boulder, CO)
	Episodic Growth of the Continental Crust	
	Colorado School of Mines	(Golden, CO)
	How did the Continents Grow?	
2011	University of Minnesota	(Minneapolis, MN)
	Punctuated Evolution of the Earth	
	Institut de Physique du Globe de Paris	(IPGP, Paris, France)
	Noble Gas Isotopic Evolution of the Earth	
2010	Geophysical Lab, Carnegie Institute	(Washington D.C.)
	Noble Gas Constraints on Mantle Evolution	
	Open University	(Milton-Keynes, UK)
	Osmium Isotopic Evidence for Punctuated Earth Evolution	

Sessions organized at national and international meetings

2014 *Fall AGU* - The Making of a Continent

2013 *Goldschmidt* - Evolution of Mantle Geochemistry; *Fall AGU* - Chemical Evolution of the Earth's Mantle.

2011 *Fall AGU* - Noble Gases in Minerals and Melts

2011 *Goldschmidt* – Session on timing of crustal growth

2009 *Goldschmidt* – Theme Organizing Committee 'Continental Crust Formation, Tectonics and Orogeny'

2008 *Fall AGU* – Episodic behavior of the Earth's interior(co-conveners J. Rudge, S. Zhong)

2008 *EGU* – The Early Earth: Inside, out and alive(co-conveners J. van Hunen, E Javaux, T Zegers, N Arndt)

2007 *EGU* – Geodynamics and Geochemistry of the early Earth(co-conveners J. van Hunen, H. Samuel)

2006 *Fall AGU* – The Early Earth (co-conveners A. Gangopadhyay, J. Blichert-Toft, M.Harrison)

2005 *Fall AGU* - Noble Gas Geochemistry (co-convener C. MacPherson)

7.c. Service to the community

2017 -present Board Member – Jewelry Museum – Providence, RI

2013 Varten-Gregorian Elementary School Science Conference, Providence, RI - lecture on Mars

2011 Martin Luther King Elementary School Science Conference, Providence, RI - lecture on Diamonds.

2008 Co-authored paper for Physics Education a journal for grade school science teachers, 'Why does plate tectonics only occurred on Earth?", Martin P, van Hunen J, Parman S and Davidson J (2008) Phys. Educ. 43: 144-150.

8. Academic Honors

2011 Keynote Lecture: Origin of Continental Lithosphere, Gordon Conference, Mt. Holyoke, MA

2009 Keynote Lecture: Water on Earth and Beyond, Institute of Advanced Study Workshop, Durham University
2008 Visiting Faculty – Blaise Pascale University, Clermont-Ferrand, France
2007 **Houtermans Medal** – European Association of Geochemists, Young Scientist Award
2006-7 Mineralogical Society of America Distinguished Lecturer
2006 Keynote Lecture: VMSG meeting, Leeds
2002 Keynote Lecture: Goldschmidt Meeting, Davos

9. Teaching

EEPS 0010 Face of the Earth (survey course for non-majors)
EEPS 0160I Diamonds (freshman seminar) - CAP course, writing requirement course
EEPS 0230 Geochemistry: Earth and Planetary Materials and Processes (required course for concentrators)
EEPS 1960I The Early Earth (graduate or senior undergraduate level lecture/seminar course)
EEPS 2430 Advanced Igneous Petrology (graduate level course)
EEPS 2910N Volcanism and Climate (graduate student or senior undergraduate level lecture/seminar course)

Research Advising

completed Ph.D. degrees:

Judith Coggon (2010, Durham Univ.) Application of the ^{190}Pt-^{186}Os isotope decay system to dating platinum-group minerals.
Colin Jackson (2014) Experimental constraints on the geochemical processing of planetary interiors: noble gases and spinel spectroscopy.
Tabb Prissel (2015) Ancient phases of our Moon: application of experimental & igneous petrology to the formation history of the lunar highlands Mg-suite.
Jack Krantz (2019) Tracing volatile cycling in the Earth with noble gases.
Brendan Anzures (2021) – joint with R Milliken – Evolution of highly reduced planetary bodies

completed Masters degrees:

Colin Jackson (2012, Brown Univ.) - Noble Gas Geochemistry
Tabb Prissel (2013, Brown Univ.) - Lunar Magmatism
Hillary O'Brien (2014, Brown Univ.) - Melting of Mercury's Mantle
Sicheng Wang (2016, Brown Univ.) – Crystallization of Mercury's magma ocean
Joseph Cukjati (2016) – joint with RF Cooper – Atom probe tomography

current Ph.D. students (start date)**:**

Thomas Williams (2021) – Joint with Alberto Saal
Emily Fischer (2022) – Joint with Alberto Saal
Wenhao Zhao (2022) – Joint with Reid Cooper

current graduate advisory and thesis committees:

Chris Kremer, Danny Anderson, Imani Guest, Cody Schultz, Laura Lark, Beau Borin

undergraduate researchers (* senior thesis):

Kelsey Williams (2012-14)*

Kassandra Costa (2009-13)*
Jennifer Sparks (2012-13)