

CURRICULUM VITAE

RICHARD DAVID ASH

1. Personal Information

Richard D. Ash,
Research Scientist/Plasma Laboratory Manager
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Employment:	2020-present	Research Scientist & Plasma Laboratory Manager, University of Maryland
	2012-2020	Associate Research Scientist & Plasma Laboratory Manager, University of Maryland
	2002- 2012	Faculty Research Assistant & Plasma Laboratory Manager, University of Maryland
	2001–2002	Visiting Associate Researcher, University of California, Los Angeles
	1999–2001	Research Fellow, University of Oxford
	1996–1999	Research Fellow Smithsonian Institution/Carnegie Institution
	1995–1996	Kalbfleisch Research Fellow, American Museum of Natural History
	1992–1995	Post-doctoral Research Associate, University of Manchester
	1990–1992	Post-doctoral Research Associate, Open University
Education:	PhD 1990	Open University, United Kingdom <i>Interstellar dust from primitive meteorites: a carbon and nitrogen isotope study</i>
	BSc 1986	Queen Mary College, University of London, UK <i>Geochemistry</i>

2. RESEARCH, SCHOLARLY, & CREATIVE ACTIVITIES

Book Chapters:

Inanez J. G., Bellucci J. J., Martin J. G., Ash R.D., McDonough W. F. and Speakman R. J. (2016) Pb Isotopic Composition of Panamanian Colonial Majolica by LA-ICP-MS. *In: Recent Advances in Laser Ablation ICP-MS for Archaeology, Natural Science in Archaeology*, Springer-Verlag Berlin Heidelberg. L. Dussubieux et al. (eds.), DOI 10.1007/978-3-662-49894-1_19

Connolly, H.C. Jr., Desch, S.J., Ash, R.D. and Jones, R.H. (2006) 'Transient Heating Events in the Protoplanetary Nebula'. *In: Meteorites and the Early Solar System II*, Arizona University Press. D. Lauretta & H.Y. McSween (eds.) p383-398.

Articles in Refereed Journals

Ullmann P.V., Voegelé K., Grandstaff D.E., Ash R.D. Zheng W., Schroeter E.R., Schweitzer M.H. and Lacovara K.J. (2020) Molecular tests support the viability of rare earth element proxies for fossil biomolecule preservation. *Scientific Reports* **10**, 15566.

Tornabene H.A., Hilton C.D., Birmingham K.R., Ash R.D. and Walker R.J. (2020) genetics, age and crystallization history of group IIC iron meteorites. *Geochim. Cosmochim. Acta* **288**, 36-50.

Crossley S.D., Ash R.D., Sunshine J.M., Corrigan C.M., McCoy T.J., Mittlefehldt D.W. and Puchtel I.S. (2020) Sulfide-dominated partial melting pathways in brachinites. *Meteoritics Planet. Sci.* **55**, 2021-2043.

Ullmann P.V., Grandstaff D.E., Ash R.D. and Lacovara K.J. (2020) Geochemical taphonomy of the Standing Rock Hadrosaur site: exploring links between rare earth elements and cellular and soft tissue preservation. *Geochim. Cosmochim. Acta* **269**, 223-237.

Hilton C.D., Ash R.D., Piccoli P.M., Kring D.A., McCoy T.J. and Walker R.J. (2020) Origin and age of metal veins in Canyon Diablo graphite nodules. *Meteoritics Planet. Sci.* **55**, 771-780

Chabot N.L., Cuaeva R.H., Beck A.W. and Ash R.D. (2020) Experimental partitioning of trace elements into schreibersite with applications to IIG iron meteorites. *Meteoritics. Planet. Sci.* **55**, 726-743.

Xiao S., Paukstelis P.J., Ash R.D., Zavalij P.Y. and Davis J.T. (2019) Drawing with iron on a gel containing supramolecular siderophore. *Angewandte Chemie* **51**, 18605-10608.

Li S., Junkin W.D., Gaschnig R.M., Ash R.D., Piccoli P.M., Candela P.A., and Rudnick R.L. (2019) Molybdenum contents of sulfides in ancient glacial diamictites: implications for molybdenum delivery to the oceans prior to the Great Oxidation Event. *Geochim. Cosmochim. Acta* **259**, 358-370.

McCoy T.J., Corrigan C.M., Nagashima K., Reynolds V.S., Ash R.D., McDonough W.F., Yang J., Goldstein J.I. and Hilton C.D. (2019) The Milton pallasite and the South Byron trio irons: Evidence for oxidation and core crystallization. *Geochim. Cosmochim. Acta* **259**, 358-370.

Nicklas R.N., Puchtel I.S., Ash R.D., Piccoli P.M., Hanski E., Nisbet E.G., Waterton P., Pearson D.G. and Anbar A.D. (2019) Secular mantle oxidation across the Archaen-Proterozoic boundary: evidence from V apatitioning in komatiites and picrites. *Geochim. Cosmochim. Acta* **250**, 49-75.

Ash R.D. and Min He (2018) Details of a thallium poisoning case revealed by single hair analysis using laser ablation inductively coupled plasma mass spectrometry. *Forensic Science International* **292**, 224-231.

O'Driscoll B., Walker R.J., Clay P.L., Day J.M.D., Ash R.D. and Daly J.S. (2018) Length-scales of chemical and isotopic heterogeneity in the mantle section of the Shetland Ophiolite Complex, Scotland. *Earth and Planetary Science Letters* **488**, 144-154

Nicklas R.W., Puchtel I.S., Ash R.D. (2018) Redox state of the Archean mantle: evidence from V partitioning in 3.5–2.4 Ga Komatiites. *Geochimica et Cosmochimica Acta* **222**, 447-466

Crossley S.D., Mayne R.G., Lunning N.G., McCoy T.J., Yang S., Humayan M., Ash R.D., Sunshine J.M., Greenwood R.C. and Franchi I.A. (2018) Experimental insights into Stannern-trend eucrite petrogenesis. *Meteoritics Planet. Sci.* 1-16. doi: 10.1111/maps.13114

Filiberto, J., Gross, J., Udry, A., Trela, J., Wittmann, A., Cannon, K. M., Penniston-Dorland S., Ash R.D., Hamilton V.E., Meado A.L., Carpenter P., Jolliff B. and Ferre E.C. (2018). Shergottite Northwest Africa 6963: A pyroxene-cumulate Martian gabbro. *Journal of Geophysical Research: Planets*, **123** 1823-1841. <https://doi.org/10.1029/>

A.T. Greaney, R. L. Rudnick, R. T. Helz, R. M. Gaschnig, Piccoli P., Ash R.D. (2017) The behavior of chalcophile elements during magmatic differentiation as observed in Kilauea Iki Lava Lake, Hawaii. Submitted to *Geochim. Cosmochim Acta* **210**, 71-96

Ming Tang, McDonough W. F., Ash R. D. (2017) Europium and strontium anomalies in the MORB source mantle. *Geochimica Cosmochimica Acta* **197** 132-141

Chabot N. L., Wollack E. A., McDonough W. F., Ash R. D., and Saslow S. A. (2017) Experimental Determination of Partitioning in the Fe-Ni System for Applications to Modeling Meteoritic Metals *Meteoritics Planet. Sci.* 1-17 (DOI: 10.1111/maps.12864)

McCoy T.J., Marquardt A.E., Wasson J.T., Ash R.D. Vicenzi E.P. (2017) The Anoka, Minnesota iron meteorite as a parent to Hopewell metal beads from Havana, Illinois. *J. Archaeo. Sci.* v. 81, p. 13-22, doi: 10.1016/j.jas.2017.03.003

Rettie A.J.E., Chemelewski W.D., Wygant B.R., Lindemuth J., Lin J-F., Eisenberg D., Bauer C.S., Johnson T.J., Ash R.D., Li X., Zhou J., Mullins C.B. (2016) Synthesis, Electronic Transport and Optical Properties of Si:α-Fe₂O₃ Single Crystals *J. Mater. Chem.C.* **4** 559-567

Day J.M.D., Lin Qiu, Ash R.D., McDonough W.F., Teng F.-Z., Rudnick R.L. and Taylor L.A. (2016) Evidence for high-temperature fractionation of lithium isotopes during differentiation of the Moon. *Met. Planet. Sci* 1-17.

Nicklas R.W., Puchtel I.S. and Ash R.D. (2016) High-precision determination of the oxidation state of komatiite lavas using vanadium liquid-mineral partitioning. *Chemical Geology* **433**, 36–45.

Liu J., Sharp M., Ash R.D., Kring D.A. and Walker R.J. (2015) Diverse impactors in Apollo 15 and 16 impact melt rocks: Evidence from osmium isotopes and highly siderophile elements. *Geochim. Cosmochim. Acta* **155**, 122-153.

O'Driscoll B., Walker R.J., Day J.M.D., Ash R.D. and J. Stephen Daly J.S. (2015) Generations of Melt Extraction, Melt-Rock Interaction and High-Temperature Metasomatism Preserved in Peridotites of the ~497 Ma Leka Ophiolite Complex, Norway. *J.Petrology* **56** (9): 1797-1828

Hyde B.C., Day J.M.D., Tait K.T., Ash R.D., Holdsworth D.W. and Moser D.E. (2014) Characterisation of weathering and heterogeneous mineral phase distribution in brachinite Northwest Africa 4872. *Meteorites and Planetary Science* **49**, 1141-1156.

Sharp N., McDonough W.F., Ticknor B.W., Ash R.D., Piccoli P.M. and Borg D.T. (2014) Rapid analysis of trinitite with nuclear forensic applications for post-detonation material analysis. *J. Radioanalytical Nucl. Chem.* **302**, 57-67.

Crispin K.L., Mikhail S., Shahar A., Hillgren V., Neil Bennett, Fowler-Gerace N., Ash R.D. and McDonough W.F. (2014) A Synthesis of Instrumental Analytical Techniques for Examination of the Thermal History of Pallasite Meteorites *Microscopy and Microanalysis* **20**, 1690-1691. DOI:10.1017/S1431927614010186

Goodrich C.A., Ash R.D., Van Orman J.A., Domanik K. and McDonough W.F. (2013) Metallic phases and siderophile elements in main group ureilites: implications for ureilite petrogenesis. *Geochim. Cosmochim. Acta* **112** 340-373

Finlay A.J., Drewicz A.E., Terry D.O. Jr., Grandstaff D.E. and Ash R.D. (2013) Suitability of bioapatite as backfill material for nuclear waste isolation. *Proc. Mat. Res. Soc.* **1518** Scientific Basis for Nuclear Waste Management, XXVI DOI: <http://dx.doi.org/10.1557/opl.2013.88>

Day J.M.D., Walker R.J., Ash R.D., Yang L., Rumble D. III, Irving A.J., Goodrich C.A. Tait K., McDonough W.F. and Taylor L.A (2012) Origin of felsic achondrites Grave Nunataks 06128 and 06129, and ultramafic brachinites and brachinite-like achondrites by partial melting of volatile-rich primitive parent bodies. *Geochim. Cosmochim. Acta*, **81**, 94-128.

Hayden L.A., Van Orman J.A., McDonough W.F., Ash R.D. and Goodrich C.A. (2011) Trace element partitioning in the Fe-S-C system and its implications for planetary differentiation and the thermal history of ureilites. *Geochim. Cosmochim. Acta* **75**, 6570-6583.

McCoy T.J., Walker R. J., Goldstein J. I., Yang J., McDonough W. F., Rumble D., Chabot N. L., Ash R. D., Corrigan C. M., Michael J.R. and Kotula P.G. (2011) Group

IVA irons; new constraints on the crystallization and cooling history of an asteroidal core with a complex history. *Geochim. Cosmochim. Acta* **75** 6821-6843.

Chabot N.L., McDonough W.F., Jones J.H., Saslow S.A., Ash R.D., Draper D.S. and Agee C.B. (2011) Partitioning behavior at 9GPa in the Fe-S system and implications for planetary evolution. *Earth Planet. Sci. Lett.* **305**, 425-434.

Corrigan C.M., Chabot N.L., McCoy T.J., McDonough W.F., Watson H.C., Saslow S.A. and Ash R.D. (2010) The iron-nickel-phosphorus system: effects on the distribution of trace elements during the evolution of iron meteorites. *Geochim. Cosmochim. Acta* **73**, 2674-2691.

Van Acken D., Becker H., Walker R.J., McDonough W.F., Wombacher F., Ash R.D. and Piccoli P.M. (2010) Formation of pyroxenite layers in the Totalp ultramafic massif (Swiss Alps) – insights from highly siderophile elements and Os isotopes. *Geochim. Cosmochim. Acta* **74**, 661-683.

Inanez J.G., Bellucci J.J., Rodriguez-Alegria E., Ash R.D., McDonough W.F. and Speakman R.J. (2010) Romita pottery revisited: a reassessment of the provenance of ceramics from colonial Mexico by LA-MC-ICP-MS. *J. Archaeo. Sci.* **37**, 2698-2704.

Kar S., Boncher W.L., Olszewski D., Dollahon N., Ash R.D. and Stoll S.L. (2010) Gadolinium doped europium sulfide. *J. Amer. Chem Soc.* **132** 13960-13962.

Penniston-Dorland S.C., Sorensen S.S., Ash R.D. and Khadkhe S.V. (2010) Lithium isotopes as a tracer of fluids in a subduction zone melange: Franciscan Complex, CA. *Earth Planet. Sci. Lett.* **292**, 181-190.

Day J.M.D., Ash R.D., Liu Y., Bellucci J.J., Rumble D. III, McDonough W.F., Walker R.J. and Taylor L.A. (2009) Early formation of evolved asteroidal crust. *Nature*, **457**, 179-182.

Day J.M.D., Ash R.D., Liu Y., Bellucci J.J., Rumble D. III, McDonough W.F., Walker R.J. and Taylor L.A. (2009) Asteroids and Andesites Reply. *Nature*, **459**, E1-2.

Walker, R.J., McDonough, W.F., Honesto, J., Chabot, N.L., McCoy, T.M., Ash, R.D. and Bellucci, J.J. (2008) Modeling fractional crystallization of Group IVB iron meteorites. *Geochim. Cosmochim. Acta*, **72**, 2198–2216

Qin K., Zhao L. Ash R.D., McDonough and Zhao R.Y. (2008) ATM-mediated transcriptional elevation of prion to copper-induced oxidative stress. *J. Biol. Chem.* **284**, 4582-4593.

Brenan, J. M., McDonough, W. F. and Ash, R. (2005) ‘An experimental study of the solubility and partitioning of iridium, osmium and gold between olivine and silicate melt’. *Earth Planet. Sci. Lett.* **237**, 855-872.

Lundstrom, C.C., Sutton, A.L., Chaussidon, M., McDonough, W.F. and Ash, R.D. (2005) ‘Trace Element Partitioning Between Type B CAI melts and Melilite and Spinel’. *Geochim. Cosmochim. Acta* **70**, 3421-3435.

- Walker, R.J., Brandon, A.D., Bird, J.M., Piccoli, P.M., McDonough, W.F. and Ash, R.D. (2005) ^{187}Os - ^{186}Os Systematics of Os-Ir-Ru Alloy Grains from Southwestern Oregon' *Earth Planet Sci. Lett.* **230**, 211-226.
- Whitby, J., Gilmour, J.D., Turner, G., Prinz, M. and Ash, R.D. (2002) 'I-Xe dating of chondrules from the Qingzhen and Kota Kota enstatite chondrites'. *Geochim. Cosmochim. Acta* **66**, 347-359.
- Young, E.D., Ash, R.D., Galy, A. and Belshaw, N.S. (2002) 'Mg isotope heterogeneity in the Allende meteorite measured by UV laser ablation-MC-ICPMS and comparisons with O isotopes'. *Geochim. Cosmochim. Acta* **66**, 683-698.
- Zhu, X., Guo, Y., O'Nions, R.K., Galy, A., Young, E.D. and Ash, R.D. (2001) 'Iron isotope homogeneity of the early solar nebula'. *Nature* **412**, 311-313.
- Galy, A., Young, E.D., Ash, R.D. and O'Nions, R.K. (2000) 'The formation of chondrules at high gas pressures in the early solar system'. *Science* **290**, 1751-1753.
- Young, E.D., Ash, R.D., England, P. and Rumble, D. III (1999) 'Fluid flow in chondritic parent bodies: deciphering the compositions of planetesimals'. *Science* **286**, 1331-1335.
- Alexander, C.M.O'D., Russell, S.S., Arden, J.W., Ash, R.D., Grady, M.M. and Pillinger, C.T. (1998) 'C and N isotopic compositions of organic material in carbonaceous and ordinary chondrites'. *Meteoritics Planet. Sci.* **33**, 603-622.
- Russell, S.S., McCoy, T.J., Jarosewich, E. and Ash R.D. (1998) 'The Burnwell, Kentucky, low-FeO chondrite fall: description, classification and origin'. *Meteoritics Planet. Sci.* **33**, 853-826.
- Turner, G., Knott, S.K., Ash, R.D. and Gilmour, J.D. (1997) Ar-Ar chronology of the Martian meteorite ALH84001: evidence for the timing of the early bombardment of Mars. *Geochim. Cosmochim. Acta* **61**, 3835-3849.
- Ash, R.D., Knott, S.F. and Turner, G. (1996) A 4-Gyr shock age for a Martian meteorite and implications for the cratering history of Mars. *Nature* **380**, 57-59.
- Gilmour, J.D., Ash, R.D., Hutchison, R., Bridges, J.C., Lyon, I.C. and Turner, G. (1995) Iodine-xenon studies of Bjurböle and Parnallee using RELAX'. *Meteoritics* **30**, 405-411.
- Ash, R.D. and Pillinger, C.T. (1995) Carbon, nitrogen and hydrogen in Saharan chondrites: The importance of weathering. *Meteoritics* **30**, 85-92.
- Connolly, H.C. Jr., Hewins, R.H., Ash, R.D., Zanda, B., Lofgren, G.E. and Bourot, Denise M. (1994) Carbon and the formation of reduced chondrules: and experimental investigation. *Nature* **371**, 136-139.
- Bischoff, A., Palme, H., Ash, R.D., Clayton, R.N., Schultz, L., Herpers, U., Stöffler, D., Grady, M.M., Pillinger, C.T., Spettel, B., Weber, H., Grund, T., Endress, M. and Weber, D. (1993) 'Paired Renazzo-type (CR) carbonaceous chondrites from the Sahara'. *Geochim. Cosmochim. Acta* **57**, 1587-1603.
- McCoy, T.J., Keil, K., Ash, R.D., Morse, A.D., Pillinger, C.T., Wieler, R., Mayeda, T.K., Clayton, R.N., Benoit, P.H., Sears, D.W.G., Casanova, I., Lindstrom, M., Muenow,

D.W., Moore, C.B. and Wilson I.E. (1993) 'Roosevelt County 075: a petrologic, chemical and isotopic study of the most un-equilibrated known H chondrite'. *Meteoritics* **28**, 681-691.

Ash, R.D., Arden, J.W., Grady, M.M., Wright, I.P. and Pillinger C.T. (1990) 'Recondite interstellar carbon in the Allende meteorite revealed by preparative precombustion'. *Geochim. Cosmochim. Acta* **54**, 455-468.

Alexander, C.M.O'D., Arden, J.W., Ash, R.D. and Pillinger C.T. (1990) 'Presolar components in the ordinary chondrites'. *Earth Planet. Sci. Lett.* **99**, 220-229.

Ash, R.D., Arden, J.W., Grady, M.M., Wright, I.P. and Pillinger, C.T. (1988) 'An interstellar dust component rich in ^{12}C '. *Nature* **336**, 228-230.

b Talks, Abstracts, and Other Professional Papers Presented

i Invited talks

- 1990 Institut für Planetologie, Münster, Germany.
- 1996 New York Astronomical Society
- 1998 Geological Society of Washington
- 2000 Royal Astronomical Society, London
Geochemistry group of the Mineralogical Society
- 2000 Oxford University Teacher's Conference
- 2001 Recent developments in ICP-MS analysis, London.
- 2002 University of California, Goldschmidt conference, Davos, Switzerland
- 2007 Royal Astronomical Society Special Meeting in memory of Bob Hutchison
- 2009 Microscopy and Microanalysis Conference, Richmond, Virginia

ii Abstracts

2018

S.D. Crossley, R.D. Ash, J.M. Sunshine, T.J. McCoy, C.M. Corrigan (2018) Oxidized Primitive Achondrites Sample Distinct Parent Bodies. *LPI Contributions* 2084, 4040

J.K. Dhaliwal, N.L. Chabot, R.D. Ash, T.J. McCoy (2018) An Experimental Analog for Metal-Sulfide Partitioning in Acapulcoite-Lodranite Meteorites. *LPI Contributions* 2084, 4020

H. Tornabene, R.D. Ash, C.D. Hilton, R.J. Walker (2018) New Insights to the Formation and Crystallization History of Group IIC Iron Meteorites. *Lunar and Planetary Science Conference* 49

P.V. Ullmann, R.D. Ash (2018) Characterizing the Structure of Diagenetically Phosphatized K/Pg Impact Spherules from Edelman Fossil Park, Mantua Township, New Jersey. *Lunar and Planetary Science Conference 49*

S.D. Crossley, R.D. Ash, J.M. Sunshine, T.J. McCoy, C.M. Corrigan (2018) Olivine-Dominated Achondrites Record Multiple Trends of Differentiation. *Lunar and Planetary Science Conference 49*

C.D. Hilton, K.R. Bermingham, R.D. Ash, R.J. Walker, T.J. McCoy (2018) Genetics, Age, and Crystallization Sequence of the South Byron Trio and the Potential Relation to the Milton Pallasite. *Lunar and Planetary Science Conference 49*

J. Filiberto, J. Gross, A. Udry, J. Trela, A. Wittmann, K.M. Cannon, S. Penniston-Dorland, R.D. Ash, V.E. Hamilton, A.L. Meado, P. Carpenter, B. Jolliff, E.C. Ferre (2018) Shergottite Northwest Africa (NWA) 6963 a Pyroxene-Cumulate Martian Gabbro: Constraints on the Mineralogy, Petrology, and Physical Properties of the Martian Crust at Depth. *Lunar and Planetary Science Conference 49*

T. Yoshizaki, W.F. McDonough, R.D. Ash (2018) Ratio Variations of Refractory Lithophile Elements in Chondrites and Their Components: Implications for Planetary Compositions. *Lunar and Planetary Science Conference 49*

2017

R. D. Ash (2017) Recycling in the early Solar System: evidence from oxygen and magnesium isotopes and trace element abundances in CAI and chondrules. Workshop on Chondrules and the Protoplanetary Disk Abstract #2044

J. Browning, P. Piccoli, R.D. Ash (2017) Origin of tourmaline in the Setters Formation, Maryland; evidence from major and trace element, boron isotope, and rare earth characteristics . 52nd Ann. Meeting Geol. Soc. America Abstract #290425

C.D. Hilton, K.R. Bermingham, R.D. Ash, P.M. Piccoli, D.A. Kring, T.J. McCoy and R.J.Walker (2017) HSE abundances and Re-Os model age of a metallic vein in Canon Diablo graphite. 48th Lunar Planet Sci. Conf. *Abstract #1671*

S. D. Crossley, R. G. Mayne, N.G. Lunning, T. J. McCoy, R. D. Ash and J. M. Sunshine. (2017) Experimental insights into Stannern-group eucrite petrogenesis. 48th Lunar Planet Sci. Conf. *Abstract #2516*

T.J. McCoy, C.M. Corrigan, K. Nagashima, V.S. Reynolds, R.J. Walker, W. F. McDonough and R.D. Ash. (2017) Milton and the South Byron trio: an oxidized parent body with an outside-in crystallizing core. 48th Lunar Planet Sci. Conf. *Abstract #2241*

2015

N. L. Chabot, A. W. Beck, R. D. Ash (2015) Examining Trace Element Partitioning into Iron Phosphide, with Applications to Iron Meteorites *78th Annual Meeting of the Meteoritical Society, Abstract #5023*

Nicklas R.W., Puchtel I.S. and Ash R.D. (2015) The Oxidation State of Archean Komatiites revisited *Goldschmidt Abstracts 2272*

Piccoli P.M., Knighton S., Kayser S., Ash R.D. and Candela P.A. (2015) Indium in magmatic-hydrothermal systems: understanding its behavior today to meet tomorrow's demand *GSA Abstracts with programs*, 47-7 (Paper#196-10)

Greaney A.T., Rudnick R.L., Helz R.T., Gaschnig R.M., Piccoli P.M. and Ash R.D. (2015) The behavior of chalcophile and siderophile elements during magmatic differentiation as observed in Kilauea Iki lava lake, Hawaii *GSA Abstracts with programs*, 47-7 (Paper#145-8)

Nicklas R.W., Puchtel I.S. and Ash R.D. (2015) The Oxidation State of Komatiites and the Redox History of the Mantle *AGU*

O'Driscoll B., Walker R.J., Clay P., Day J.M.D., Ash R.D., Daly J. (2015) Lithological, Chemical and Chronological Constraints on Melt Extraction from the Mantle Section of the ~492 Ma Shetland Ophiolite Complex, Scotland, *AGU* 72384

Greaney A.T., Rudnick R.L., Helz R.T., Gaschnig R.M., Ash R.D., Piccoli P.M. (2015) The Behavior of Chalcophile and Siderophile Elements during Magmatic Differentiation as Observed in Kilauea Iki Lava Lake, Hawaii *AGU* 70008

2014

G. J. Archer, R. D. Ash, E. S. Bullock, and R. J. Walker (2014) Highly Siderophile Elements and ¹⁸⁷Re-¹⁸⁷O Isotopic Systematics of the Allende Meteorite Record both Primary Nebular and Late-Stage Parent Body Alteration Processes *45th Lunar and Planetary Science Conference, Abstract #1463*

M. M. McAdam, J. M. Sunshine, R. D. Ash, L. C. Cheek, C. M. Corrigan, T. J. McCoy, and T. Hiroi (2014) Seeing Past Alteration: Revealing Spectral Signature of the Primary Mineralogy of GRA 06128/9 *45th Lunar and Planetary Science Conference, Abstract #1573*

R. D. Ash, R. J. Walker, A. Yamakawa, and Q.-Z. Yin (2014) New Insights into the Origin of Lovina, a Mystery Metal *45th Lunar and Planetary Science Conference, Abstract #1434*

N. L. Chabot, E. A. Wollack, W. F. McDonough, and R. D. Ash (2014) The Effect of Light Elements in Metallic Liquids on Partitioning Behavior *45th Lunar and Planetary Science Conference, Abstract #1165*

2013

Hyde B.C, Tait K.T., Nicklin I., Day J.M.D., Ash R.D. and Moser D.E. Use of micro-CT and precision cutting to assess meteorite heterogeneity: and example using brachiniite NWA 4872 *76th Annual Meeting of the Meteoritical Society (2013), Abstract #5301.*

Goodrich C.A., Ash R.D., Van Orman J.A., and Wilson L. Origin of metal in ureilites: Problems, possibilities, and implications for ureilite petrogenesis *44th Lunar and Planetary Science Conference (2013), Abstract #1384.*

2012

Connolly H.C. Jr., Barcena H., Domanik K., Nagashima K., Huss G.R., Ash R.D., Weisberg M.K. Constraining the nature of Type-I chondrules from UOCs: a detailed in situ petrologic and geochemical investigation. *43rd Lunar and Planetary Science Conference (2012)*, Abstract #2204.

Liu J.G., Ash R.D. and Walker R.J. Fractionation and remobilization of siderophile elements in metal grains of Apollo 16 Lunar impact-melt breccia 67095. *43rd Lunar and Planetary Science Conference (2012)*, Abstract #2683.

Marquardt A., Gates G., Breitung E., Ash R.D., Robloff G., Phaneuf R., and Drayman-Weisser T. Atomic Layer Deposition (ALD) films as protective coatings for silver. *American Institute of Conservators 40th Annual Meeting*

Connolly H.C. Jr., Nagashima K., Huss G.R., Domanik K., Barcena H., Weisberg M.K. and Ash R.D. Oxygen isotopes in chondrules: similarity between UOC and E3 chondrule precursors? *Meteoritics Planet. Sci.* **47** (2012), A106.

2011

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iv ***Reviewing Activities for Journals and Other Learned Publications***

Earth and Planetary Science Letters

Geochimica et Cosmochimica Acta

Meteoritics and Planetary Science

Nature

Science

v ***Reviewing Activities for Research Funding Bodies***

NASA (Cosmochemistry, Origins, SRLIDAP, FINESST, Solar System Workings, Emerging Worlds)

NSF

Natural Environment Research Council (NERC)

Particle Physics and Astronomy Research Council (PPARC)

Science and Technology Facilities Council (STFC)

vi ***Other reviewing and journalistic activities:***

Coverage of Thallium Poisoning paper: "Mass Spectrometry Sheds New Light on Thallium Poisoning Cold Case" *Science in a Shell* (CMNS electronic newsletter), "Du Nouveau pour l'Affair de l'Empoisonnement au Thallium de 1994" *Fredzone*, "Case Study: Heavy Metal Poisoning Pinpointed with Old Hairs" by Seth Augenstein, *Forensic Magazine*, "Study brings us one step closer to solving 1994 thallium poisoning case" by Jennifer Ouellette, *ArsTechnica*.

Discovery Channel

Aquila Magazine

Meteorite/Cosmochemistry Consultant - *Scienceline* Educational Information Service

Reviewer, AAAS *Science Books and Films*

Interviewed - *Aquila Magazine* for young journalist competition

Interviewed by *BBC World Service* about ALH84001 dating (Ash *et al.*, 1996)

Interviews and commentary by CNN, CNN International. *CBS, NBC, C-NBC, Fox*

TV, New York News, Channel 11, Los Angeles Times about McKay *et al.*, "Life on Mars" Science paper

Contributor - 'Kids in the Hall of Planet Earth' website (AMNH)

Interviewed - Central TV news on "Dangers of Asteroid Impact"

3. TEACHING, MENTORING, AND ADVISING

i ***Open University***

Taught Open University Summer School Science Foundation course (S101) and Geology Field and Laboratory courses (S236) over five years.

- ii** ***Manchester University***
 Taught part of the third year 'Planetary Geology' course covering Meteoritics, Isotope Cosmochemistry, Nucleosynthesis and Presolar Grains.
 Supervised - Meteorite Mineralogy/Petrology practical classes.
 Undergraduate tutor and undergraduate geochemistry project supervisor.

- iii** ***Carnegie Institution***
 Volunteer - CASE Summer Programme (teaching teachers about science)

- iv** ***University of Maryland***
 Occasional laboratory teaching for undergraduate and graduate level geochemistry and instrumentation classes
 Occasional classroom teaching for undergraduate Earth Science and Planetary Science courses, and graduate Cosmochemistry course.
 Mentoring undergraduate, graduate and post-doctoral users of the plasma mass spectrometry laboratory.
 Frequent laboratory and science co-supervisor for undergraduate thesis projects (Geol 393/394)

- PhD Committee for Ricardo Arevalo (2010)
- PhD Committee for Jeremy Bellucci (2010)
- MS Committee for Gregory Archer (2012)
- MS Committee for Yadviga Zhelezinskaya (2012)
- PhD Committee for Gregory Archer
- PhD Committee for Willie Nicklas (2019)
- PhD Committee for Connor Hilton (2020)
- PhD Co-Supervisor for Sam Crossley (with Prof. Jessica Sunshine, Astronomy)

4. SERVICE

a. Professional

- i** ***University of Maryland***
 2004 - present University of Maryland, Department of Environmental Safety
 Compliance Officer for Department of Geology
 2008 - present University of Maryland, Graduate Faculty
 2011 Member of the Search Committee for Assistant Director, Department of Environmental Safety
 2016-present University of Maryland Senator representing PTK faculty

- ii** ***Oxford University***
 Cosmochemistry seminar and discussion leader, Oxford University Teachers' Conference.

- iii** ***American Museum of Natural History***
 Design/Content Committee - Hall of Planet Earth Exhibition

Committee for the planning of the Hall of Planet Earth (American Museum of Natural History)
Liaison Committee for the Hall of Planet Earth/Hall of the Universe (Hayden Planetarium)

iv Other Committees and Service

Martian Meteorite Working Group (NASA/NSF)
Stephen E. Dworkin Prize Award Committee at 30th Lunar & Planetary Science Conference
Stephen E. Dworkin Prize Award Committee at 39th Lunar & Planetary Science Conference
Member Meteorite Nomenclature Committee

b Membership of Professional Bodies

Meteoritical Society
Geochemical Society
American Geophysical Union

Analytical Experience

Expertise in ICP-MS, both single- and multi-collector, by solution and laser ablation for isotope and trace element analysis and expertise in the isotopic analysis of both active and noble gases by dynamic and static gas source mass spectrometry and by GC/IRMS.

Experience with electron microscope and electron microprobe; analytical transmission; electron microscopy; electron diffraction; x-ray fluorescence; ICP-AES; and, infra-red spectroscopy.