Richard J. Walker

Contact Information

Address:	Department of Geology 8000 Regents Drive University of Maryland College Park, Maryland 20742
Office:	0228 CHEM
Tel:	(301) 405-4089
Email:	rjwalker@umd.edu
URL:	https://www.geol.umd.edu/richardwalker

Academic Appointments at UMd

2019-Present	Distinguished University Professor
2015-2021	Chair, Department of Geology
1998-2019	Professor, Department of Geology
1993-1998:	Associate Professor, Department of Geology
1990-1993:	Assistant Professor, Department of Geology

Other Positions Held

2015:	Visiting Professor, University of Vienna Visiting Scientist, Earth-Life Science Institute, Tokyo Tech
2014:	Visiting Scientist, Lunar and Planetary Institute Tuve Fellow, Department of Terrestrial Magnetism, Carnegie Institution of Washington
1997:	Alexander von Humboldt Fellow, Max Planck Institüt für Chemie, Mainz, Germany
1989-1990:	Geologist, U.S. Geological Survey, Isotope Branch, Reston, VA
1987-1989:	Research Associate, Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington D.C.
1985-1987:	National Research Council Postdoctoral Fellow, National Bureau of Standards, Gaithersburg, MD
1981-1984:	Research Assistant, SUNY, Stony Brook, NY
1979-1981:	Teaching Assistant, SUNY, Stony Brook, NY

Educational Background

Ph.D., 1984	Earth and Space Sciences, State University of New York at Stony Brook, Stony Brook, NY
M.S., 1981	Earth and Space Sciences, State University of New York at Stony Brook, Stony Brook, NY
B.S., 1979	Geology, College of William and Mary, Williamsburg, VA

Research Interests

Research interests include the application of isotope and trace element geochemistry to fundamental problems in the origin and evolution of the early solar system, the chemical structure and evolution of the Earth's core, mantle and crust, and interactions between various chemical reservoirs with the Earth.

Professional Society Memberships

American Association for the Advancement of Science, American Geophysical Union, European Association of Geochemistry, Geochemical Society, Geological Society of America, Geological Society of Washington, Meteoritical Society

Awards/Honors

2022	Elected to National Academy of Sciences
2022	Elected to American Academy of Arts and Sciences
2019	Hess Medalist, American Geophysical Union
2019	Distinguished University Professor
2017	Honorary Doctorate, University of Oulu, Oulu, Finland
2016	Daly Lecture, VGP-section, American Geophysical Union
2015	Tuve Fellow, Carnegie Institution of Washington, Department of Terrestrial Magnetism
2011	Kirwan Faculty Research and Scholarship Prize
2009	Fellow, American Geophysical Union
2009	Fellow, Geochemical Society and European Association of Geochemistry
2005	College of Computer, Mathematics and Physical Sciences, Board of Visitors Distinguished Faculty Award
1997	Alexander von Humboldt Fellow
1990	Geochemical Society Clarke Medal.

Editorships

Associate Editor, Geochimica et Cosmochimica Acta (2002-2021)
Associate Editor, American Journal of Science (2000-present)
Co-Editor, Transactions of the Royal Society of Edinburgh **87**, Third Hutton Symposium: the Origin of Granites and Related Rocks (1995)

Advisory Committees, Panels and Other Service

EAG Science Innovation Award committee (2023)
J. Lawrence Smith Medal selection committee (2023)
Day Prize and Lectureship selection committee (2022)
NASA Panel (2020)
National Science Foundation Earth Science Review Panel (2020)
First Billion Years: Bombardment Meeting, Flagstaff, AZ, Organizing Committee (2018)
Canada Foundation for Innovation Panel (2017)
National Science Foundation Earth Science Review Panel (2017)
CIDER (Cooperative Institute for Dynamic Earth Research) Lecturer (2016)
CIDER (Cooperative Institute for Dynamic Earth Research) Lecturer (2014)

Workshop on Early Solar System Impact Bombardment III. Organizing Committee (2015)
Member: NASA Curation and Analysis Planning Team for Extra-terrestrial Materials (2015-2018)
NASA Panel (2014)
NASA Panel (2013)
Workshop of the Early Solar System Impact Bombardment II. Organizing Committee (2012)
Expert Committee on Earth Sciences for the 2012 Leading Edge and New Initiatives Funds competition (Canada) (2012)
Geological Society of Washington nominations committee chair (2011)
NASA Cosmochemistry Management Operations Working Group (2010-2014)
NASA Panels (2010-2011)
Geochemical Society Board of Directors (2010-2016)
NSF Panel (2009)
NASA Panel (2008)
NSF Panel (2006)
President, Geological Society of Washington (2006)
Organizing Committee, Early Planetary Differentiation Workshop (2006)
NASA New Frontiers Red Team Review Panel (2005)
NSF CSEDI Meeting Organizer (2004)
NSF Panels (2003-2006)
NASA Panels (2001-2002)
Program Committee: 32nd and 33rd Lunar and Planetary Science Conference (2001-2002)
Speaker Organizer: Geological Society of Washington (1999-2000)
Geochemical Society Program Committee (1997-1999)
Organizer, European Association of Geochemistry-Workshop 1997, Origin and fractionation of highly siderophile elements
NASA Panel, 1996-1998
Lunar and Planetary Geosciences Review Panel (NASA), 1996-1998
Council Officer: Geological Society of Washington (1995-1996)
Organizing committee for the 3rd Hutton Symposium on Granites (1993-95)
Geochemical Society Clarke Medal Nominations Committee (1991-1994)

University Service

Climate Working Group Committee (2023)
Member, Kirwan Award Committee (2013)
Chair, Kirwan Award Committee (2012)
NSF-PIRE Pre-proposal Selection Committee (2009)
Presenter, REACTS 2008 (Reaching Educators for the Teaching of Chemistry Statewide)
Summer Fellowship Selection Committee (2008)
Graduate Fellowship Subcommittee (2006-2009)
Graduate Council (2006-2009)
University Honor Council (1993-1995)
University Graduate Fellowship Committee (1996-1999)
Packard Fellowship Selection Committee (1996)

College Service

Chair, Search for Department of Atmospheric and Oceanic Sciences Chair (2017-2018)
Member, CMNS Space Committee (2011-2012)
Chair, Review of Chair of Department of Atmospheric and Oceanic Sciences (2011)
Department of Astronomy Faculty Search Committee (2010)
Advanced Graduate Student Workshop Panelist (2009)
Associate Dean Search Committee (2009)
CMPS Advancement, Promotion and Tenure Committee (2007-2010)
Chair Search Committee, Physics Department, 2006
Earth Science Research Coordinator Selection Committee (2000)
ESSIC Advancement Promotion and Tenure Committee (2000-2001)
ESSIC Director and Faculty Search (1999-2000)
Graduate Initiatives Committee (1999-2000)
CMPS Advancement Promotion and Tenure Committee (1998-2000)
CMPS Dean Search Committee (1998-1999)
Member, CMPS Space Committee (1991-1993)
Chen Fellowship Committee (1996)

Departmental Service

Chair, Department of Geology (2015-2021)
Chair, Teaching Laboratory Renovation Committee (2012)
Chair, Merit Pay Committee (2011)
Chair, Geophysics Faculty Search Committee (2011)
Member, Program Coordinator/Graduate Secretary Search Committee (2010)
Member, Program Coordinator Search Committee (2008)
Faculty Search Committee (2005-2006)
Chemistry Building Corridor Construction Coordinator (2001-2007)
Earth Science Curriculum Committee (1999-2000)
Space Committee (1999-2000)
Faculty Search Committee (1999-2000)
Faculty Search Committee (1998-1999)
Faculty Search Committee (1996-1997)
Member, Internal Review Committee, Department of Geology (1994)
Graduate Director (1994-2008)
Curriculum Development: Earth Materials Committee (Chair, 1994)
Merit Pay Committee (1993)
Class Scheduling Coordinator (1992-1995)
Chair, Graduate Recruitment Committee (1991-2008)
Seminar Coordinator (1991-1995)
Member, Graduate Committee (1990-2011)
Library Representative (1990-1999)

Keynote Lectures (since 2005)

(2024) Top down or bottom up? Earth's siderophile element riddles. 2024 Goldschmidt Conference, Chicago.

(2023) Geochemical weirdness of the early Earth and implications for Earth evolution. 2023 Goldschmidt Conference, Lyon, France.
(2023) A review of ^{182}W in old & young terrestrial systems. Workshop on Analytical Techniques of Refractory Elements and Isotopes & their Applications, Guilin University of Technology, Guilin, China.
(2019) Hf-W Evidence that Ocean Island Basalts Access Tuzo and Jason, 2019 Kaufman INSTOC Symposium, Cornell University, Ithaca, NY
(2018) Revisiting Late Accretion. 2018 Goldschmidt Conference, Boston, MA.
(2018) Implications of Isotopic Heterogeneity of Short-lived Systems for Differentiation Processes on the Early Earth, TRR 170 Summer School 2018, "Origin of the Earth-Moon System', Burg Reichenstein, Trechtingshausen, Germany
(2017) Implications of Isotopic Heterogeneity of Short-lived Systems for Earth Formation and Long-term Evolution. Gordon Research Conference, Interior of the Earth, Mt. Holyoke, MA.
(2016) Siderophile elements in tracing planetary formation and evolution. Daly Lecture, Fall Meeting of the American Geophysical Union. San Francisco, CA
(2016) Siderophile element constraints on the deep Earth: what's down there and how and when did it form? 2016 Goldschmidt Conference, Yokohma, Japan.
(2014) Chemical/isotopic tracing of late stages of planetary accretion. 2014 Goldschmidt Conference, Sacramento, CA.
(2014) Secular evolution of highly siderophile elements in the oceanic mantle. 9th South American Symposium on Isotope Geology (SSAGI), Sao Paolo, Brazil.
(2013) In search of Earth's building blocks and the early history of mantle mixing. Post-AGU 2013 Cider Workshop. UC Berkely, CA
(2012) Combined ^{182}W, $^{186,187}Os$ and $^{142,143}Nd$ constraints on terrestrial differentiation and mantle mixing. 2012 Goldschmidt Conference, Montreal, Canada.
(2007) The $^{187}Os/^{188}Os$ of the convecting upper mantle: An update. 2007 Goldschmidt Conference, Cologne, Germany.
(2007) Isotopic and highly siderophile element constraints on planetary late accretion". The 1st KIGAM Workshop on Planetary Geology. Korea Institute of Geoscience and Mineral Resources, Daejeon, South Korea.
(2006) The search for evidence of chemical interactions between the core and mantle. 2006 Goldschmidt Conference, Melbourne, Australia.

Peer Reviewed Publications

Citations (as of August 2024):
Google Scholar: h-index 90; total citations >27,000
Web of Science: h-index 76; total citations >20,000
ORCID ID: orcid.org/0000-0003-0348-2407

Chapters in Books

1. Day J.M.D., Brandon A.D. and **Walker R.J.** (2016) Highly siderophile elements in Earth, Mars, the Moon, and Asteroids. *Reviews in Mineralogy & Geochemistry*. v. **81** pp. 161-238.

2. Yokoyama T. and **Walker R.J.** (2016) Nucleosynthetic isotope variations of siderophile and chalcophile elements in the Solar System. *Reviews in Mineralogy & Geochemistry*. v. **81** pp. 107-160.

3. Carlson R.W., Boyet M., O'Neil J., Rizo H. and **Walker R.J.** (2015) Early differentiation and its long term consequences for Earth evolution. In *The Early Earth: Accretion and Differentiation*, J. Badro and M. Walter (eds.), American Geophysical Union Geophysical Monograph **212**, John Wiley & Sons, Inc., pp. 143-172.

4. Righter K., **Walker R.J.** and Warren P.H. (2000) Significance of highly siderophile elements and Os isotopes in the lunar and terrestrial mantles. In *Origin of the Earth and Moon*, R. Canup and K. Righter (eds.), Univ. Arizona Press, Tucson, 291-322.

5. Tomascak P.B., Krogstad E.J. and **Walker R.J.** (1999) Clues to the significance of the Norumbega Fault Zone in southwestern Maine from the geochemistry of granitic rocks. In, *The Norumbega Fault Zone*, eds. A. Ludman and D.P. West, G.S.A. Special Paper **331**, 105-119.

6. Walker, R.J., Morgan, J.W., Hanski, E.J. and Smolkin, V.F. (1994) The role of the Re-Os system in the study of magmatic sulfide ores: A tale of three ores. *Proceedings of Sudbury-Norilsk Symposium*, Ontario *Geological Survey Spec. Pub.* **5**, 343-355.

7. **Walker R.J.**, Fassett J.D. and Travis J.C. (1988) The use of resonance ionization mass spectrometry for measuring the isotopic compositions of rhenium and osmium extracted from silicate rocks. *Resonance Ionization Spectroscopy 1988*, G.S. Hurst and C.G. Morgan (Eds.), Inst. of Phys. Conf. Ser. **94**, 337-342.

8. Fassett J.D. and **Walker R.J.** (1987) Ultratrace elemental and isotopic analysis of osmium and rhenium using resonance ionization mass spectrometry and thermal vaporization. *Resonance Ionization Spectroscopy 1986*, G.S. Hurst and C.G. Morgan (Eds.), Inst. of Phys. Conf. Ser. **84**, 115-120.

9. Shearer C.K., Papike J.J. and **Walker R.J.** (1985) Mineral chemistry of the Harney Peak Granite and associated pegmatites. In *Geology of the Black Hills, South Dakota and Wyoming*, F.J. Rich (Ed.), American Geological Institute, Alexandria, VA 241-260.

Encyclopedia Articles

1. **Walker R.J.** (2016) Rhenium-Osmium Isotope System. *Encyclopedia of Geochemistry* (W. White ed.), *Springer Science*, DOI 10.1007/978-3-319-39193-9_128-1.

2. **Walker R.J.** (2015) Rhenium-Osmium Dating (Meteorites) *Encyclopedia of Scientific Dating Methods*. (W.J. Rink and J. Thompson eds.), *Springer Science*, pp. 703-707.

3. **Walker R.J.** (2016) Osmium. *Encyclopedia of Geochemistry* (W. White ed.), *Springer Science*, doi:10.1007/978-3-319-39193-9_127-1.

Journal Articles

* - Work published as part of a UMd or other M.S. or Ph.D. thesis/dissertation project.
** - Work published as part of a B.S. UMd senior thesis research project.

1. **Walker R.J.** and Papike J.J. (1981) The relationship of the lunar regolith <10 micron fraction and agglutinates. Part 2: Chemical composition of agglutinate glass as a test of the fusion of the finest fraction model. *Proc. 12th Lunar and Planet. Sci. Conf.*, 421-432.

2. **Walker R.J.** and Papike J.J. (1981) The Apollo 15 regolith: Comparative petrology of drive tube 15010/15011 and drill core section 15003. *Proc. 12th Lunar and Planet. Sci. Conf.*, 485-508.

3. **Walker R.J.** and Papike J.J. (1981) The Apollo 15 regolith: Chemical modeling and mare/highland mixing. *Proc. 12th Lunar and Planet. Sci. Conf.*, 509-517.

4. Laul J.C., **Walker R.J.**, Shearer C.K., Papike J.J. and Simon S.B. (1984) Chemical migration by contact metamorphism between pegmatite and country rocks: Natural analogs for radionuclide migration. *Mat. Res. Soc. Symp. Proc.* **26**, 951-958.

5. **Walker R.J.**, Hanson G.N., Papike J.J., O'Neil J.R. and Laul J.C. (1986) The internal evolution of the Tin Mountain pegmatite, Black Hills, South Dakota. *Am. Min.* **71**, 440-459.

6. **Walker R.J.**, Hanson G.N., Papike J.J. and O'Neil J.R. (1986) Nd, O and Sr isotope constraints on the origin of Precambrian rocks, Black Hills, South Dakota. *Geochim. Cosmochim. Acta* **50**, 2833-2846.

7. **Walker R.J.** and Fassett J.D. (1986) Isotopic measurement of subnanogram quantities of rhenium and osmium by resonance ionization mass spectrometry. *Anal. Chem.* **58**, 2923-2927.

8. Fassett J.D., **Walker R.J.**, Travis J.C. and Ruegg F.C. (1987) Quantification of pulsed ion currents produced in resonance ionization mass spectrometry. *Int. J. Mass Spectrom. Ion Proc.* **75**, 111-126.

9. Shearer C.K., Papike J.J., Redden J.A., Simon S.B., **Walker R.J**. and Laul J.C. (1987) Origin of pegmatitic granite segregations, Willow Creek, Black Hills, South Dakota. *Can. Mineral.* **25**, 159-171.

10. **Walker R.J.**, Shirey S.B. and Stecher O. (1988) Comparative Re-Os, Sm-Nd and Rb-Sr isotope and trace element systematics for Archean komatiite flows from Munro Township, Abitibi Belt, Ontario. *Earth Planet. Sci. Lett.* **87**, 1-12.

11. **Walker R.J.** (1988) Low-blank chemical separation of osmium and rhenium from gram quantities of silicate rock for measurement by resonance ionization mass spectrometry. *Anal. Chem.* **60**, 1231-1234.

12. Fassett J.D., **Walker R.J.**, Travis J.C. and Ruegg F.C. (1988) Measurement of low abundance isotopes by laser resonance ionization mass spectrometry. *Anal. Chem.* **60**, 1231-1234.

13. **Walker R.J.** and Morgan J.W. (1989) Rhenium-osmium isotope systematics of carbonaceous chondrites. *Science* **243**, 519-522.

14. **Walker R.J.**, Hanson G.N. and Papike J.J. (1989) Trace element constraints on pegmatite genesis: Tin Mountain pegmatite, Black Hills, South Dakota. *Contrib. Mineral. Petrol.* **101**, 290-300.

15. Lambert D.D., Morgan J.W., **Walker R.J.**, Shirey S.B., Carlson R.W., Zientek M.L. and Koski M.S. (1989) Rhenium-osmium and samarium-neodymium isotopic systematics of the Stillwater Complex. *Science* **244**, 1169-1174.

16. **Walker R.J.**, Carlson R.W., Shirey S.B. and Boyd F.R. (1989) Os, Sr, Nd, and Pb isotope systematics of southern African peridotite xenoliths: Implications for the chemical evolution of subcontinental mantle. *Geochim. Cosmochim. Acta* **53**, 1583-1595.

17. Morgan J.W. and **Walker R.J.** (1989) Isotopic determinations of rhenium and osmium using fusion, distillation and ion exchange separations, as applied to meteorites. *Anal. Chim. Acta* **222**, 91-9300.

18. **Walker R.J.**, Shirey S.B., Hanson G.N., Rajamani V. and Horan M.F. (1989) Re-Os, Rb-Sr and O isotopic systematics of the Archean Kolar schist belt, Karnataka, India. *Geochim. Cosmochim. Acta* **53**, 3005-3013.

19. Mayo S., Fassett J.D., Kingston H.M. and **Walker R.J.** (1990) Measurement of vanadium impurity in SIMOX material by isotope dilution and resonance ionization mass spectrometry. *Anal. Chem.* **62**, 240-244.

20. **Walker R.J.**, Echeverría L.M., Shirey S.B. and Horan M.F. (1991) Re-Os isotopic constraints on the origin of volcanic rocks, Gorgona Island, Colombia: Os isotopic evidence for ancient heterogeneities in the mantle. *Contrib. Mineral. Petrol.* **107**, 150-162.

21. **Walker R.J.**, Morgan J.W., Naldrett A.J., Li C. and Fassett J.D. (1991) Re-Os isotope systematics of Ni-Cu Sulfide Ores, Sudbury Igneous Complex, Ontario: Evidence for a major crustal component. *Earth Planet. Sci. Lett.* **105**, 416-429.

22. Horan M.F., Morgan J.W., **Walker R.J.** and Grossman J.N.(1992) Re-Os isotope constraints on the age of iron meteorites. *Science* **255**, 1118-1121.

23. Morgan J.W., **Walker R.J.** and Grossman J.N. (1992) Rhenium-osmium isotope systematics in meteorites I: Magmatic iron meteorite groups IIAB and IIIAB. *Earth Planet. Sci. Lett.* **108**, 191-202.

24. Krogstad E.J., **Walker R.J.**, Nabelek P.I. and Russ-Nabelek C. (1993) Pb isotopic constraints on the origin of Archean and Proterozoic granites, Black Hills, South Dakota. *Geochim. Cosmochim. Acta* **57**, 4677-4685.

25. **Walker, R.J.**, Morgan, J.W., Hanski, E.J. and Smolkin, V.F. (1994) The role of the Re-Os system in the study of magmatic sulfide ores: A tale of three ores. P*roceedings of Sudbury-Norilsk Symposium, Ontario Geological Survey Spec. Pub.* **5**, 343-355.

26. Krogstad E.J. and **Walker R. J.** (1994) High closure temperatures of the U-Pb system in large apatites from the Tin Mountain pegmatite, Black Hills, South Dakota. *Geochim. Cosmochim. Acta* **58**, 3845-3853.

27. **Walker, R.J.**, Morgan J.W., Horan M.F., Czamanske G.F., Krogstad E.J., Fedorenko V. and Kunilov V.E. (1994) Re-Os isotopic evidence for an enriched-mantle source for the Noril'sk-type ore-bearing intrusions, Siberia. *Geochim. Cosmochim. Acta* **58**, 4179-4197.

28. Lambert D.D., **Walker R.J.**, Morgan J.W., Shirey S.B., Carlson R.W., Zientek M.L., Lipin B.R., Koski M.S. and Cooper R.L. (1994) Re-Os and Sm-Nd isotope geochemistry of the Stillwater Complex, Montana: Implications for the petrogenesis of the J-M Reef. *Journ. Petrol.* **35**, 1717-1753.

29. Morgan J.W., Horan M.F., **Walker R.J.** and Grossman J.N. (1995) Rhenium-osmium concentration and isotope systematics in group IIAB iron meteorites. *Geochim. Cosmochim. Acta* **59**, 2331-2344.

30. Shirey S.B. and **Walker R.J.** (1995) Carius tube digestion for low-blank rhenium-osmium analysis. *Anal. Chem.* **34**, 21362141.

31. **Walker R.J.**, Morgan J.W. and Horan M.F. (1995) ^{187}Os enrichment in some mantle plume sources: Evidence for core-mantle interaction? *Science* **269**, 819-822.

32. Horan M.F., **Walker R.J**., Fedorenko V.A. and Czamanske G.K. (1995) Os and Nd isotopic constraints on the temporal and spatial evolution of Siberian flood basalt sources. *Geochim. Cosmochim. Acta* **59**, 5159-5168.

33. *Smoliar M.I., **Walker R.J.** and Morgan J.W. (1996) Re-Os ages of group IIA, IIIA, IVA and IVB iron meteorites. *Science* **271**, 1099-1102.

34. *Tomascak P.B., Krogstad E.J. and **Walker R.J.** (1996) U-Pb monazite geochronolgy of granitic rocks from Maine:implications for late Paleozoic tectonics in the northern Appalachians. *J. of Geol*. **104**, 185-195.

35. Koide M., Goldberg E.D. and **Walker R.** (1996) The analysis of seawater osmium. *Deep-Sea Res*. **43**, 53-55.

36. **Walker R.J**., Hanski E.J., Vuollo J. and Liipo J. (1996) The Os isotopic composition of Proterozoic upper mantle:evidence for chondritic upper mantle from the Outokumpu ophiolite, Finland. *Earth Planet. Sci. Lett.* **141**, 161-173.

37. Krogstad E.J. and **Walker R.J.** (1996) Evidence of heterogeneous crustal sources: the Harney Peak Granite, South Dakota, U.S.A. *Trans. Roy. Soc. Edinburgh; Earth Sciences* **87**, 331-337.

38. Meisel T., **Walker R.J.** and Morgan J.W. (1996) The osmium isotopic composition of the Earth's primitive upper mantle. *Nature* **383**, 517-520.

39. *Tomascak P.B., Krogstad E.J. and **Walker R.J.** (1996) Mixed crustal sources for the late Paleozoic Sebago batholith, Maine, U.S.A. *Contrib. Mineral. Pet.* **125**, 45-59.

40. **Walker R. J.**, Morgan J.W., Hanski E.J. and Smolkin V. (1997) Re-Os systematics of Early Proterozoic ferropicrites, Pechenga Complex, NW Russia:evidence for ancient ^{187}Os-enriched plumes. *Geochim. Cosmochim. Acta* **61**, 3145-3160.

41. Terakado Y., Fujitani T. and **Walker R.J.** (1997) Nd and Sr isotopic constraints on the origin of igneous rocks resulting from the opening of the Japan Sea, southwestern Japan. *Contrib. Mineral. Pet.* **129**, 75-86.

42. **Walker R.J.**, Morgan J.W., Beary E., Smoliar M.I., Czamanske G.K. and Horan M.F. (1997) Applications of the ^{190}Pt-^{186}Os isotope system to geochemistry and cosmochemistry. *Geochim. Cosmochim. Acta* **61**, 4799-4808.

43. Shirey S.B. and **Walker R.J.** (1998) Re-Os isotopes in cosmochemistry and high-temperature geochemistry. *Annual Reviews of the Earth and Planetary Sciences* **26**, 423-500.

44. Horan M.F., *Smoliar M.I. and **Walker R.J.** (1998) ^{182}W and ^{187}Re-^{187}Os systematics of iron meteorites: chronology for melting, differentiation and crystallization in asteroids. *Geochim. Cosmochim. Acta* **62**, 545-554.

45. Asmerom Y. and **Walker R.J.** (1998) Pb and Os isotopic constraints on the composition and rheology of the lower crust. *Geology* **26**, 359-362.

46. Brandon A., **Walker R.J.**, Morgan J.W., Norman M.D. and Prichard H.M. (1998) Coupled ^{186}Os and ^{187}Os evidence for core-mantle interaction. *Science* **280**, 1570-1573.

47. *Tomascak P.B., Krogstad E.J. and **Walker R.J.** (1998) Nd isotope systematics and the derivation of granitic pegmatites in southwestern Maine, USA. *Canadian Mineralogist* **36**, 327-337.

48. **Walker R.J.**, Storey M., Kerr A., Tarney J. and Arndt N.T. (1999) Implications of ^{187}Os heterogeneities in mantle plumes: evidence from Gorgona Island and Curaçao. *Geochim. Cosmochim. Acta* **63**, 713-728.

49. Tomascak P., Tera F., Helz R. and **Walker R**. (1999) The absence of lithium isotope fractionation during basalt differentiation: New measurements by multi-collector sector ICP-MS. *Geochim. Cosmochim. Acta* **63**, 907-910.

50. Brandon A.D., Norman M.D., **Walker R.J.** and Morgan J.W. (1999) ^{186}Os-^{187}Os systematics of Hawaiian picrites. *Earth Planet. Sci. Lett.* **172**, 25-42.

51. *Tsuru A., **Walker R.J.**, Kontinen A., Peltonen P. and Hanski E. (2000) Re-Os isotopic systematics of the Jormua Ophiolite Complex, NW Finland. *Chemical Geology* **164**, 123-141.

52. Borg L.E., Brandon A.D., Clynne M.A. and **Walker R.J.** (2000) Re-Os isotopic systematics of primitive basalts from the Lassen region of the Cascade arc, California. *Earth Planet. Sci. Lett.* **177**, 301-317.

53. Brandon A.D., Snow J.E., **Walker R.J.**, Morgan J.W. and Mock T.D. (2000) ^{190}Pt-^{186}Os and ^{187}Re-^{187}Os systematics of abyssal peridotites. *Earth Planet. Sci. Lett.* **177**, 319-335.

54. Helz G.R., Adelson J.M., Miller C.V., Cornwell J.C., Hill J.M., Horan M. and **Walker R.J.** (2000) Osmium isotopes demonstrate distal transport of contaminated sediments in Chesapeake Bay. *Environmental Science and Technology* **34**, 2528-2534.

55. Borisov A. and **Walker R.J.** (2000) Os solubility in silicate melts: new efforts and results. *American Mineralogist* **85**, 912-918.

56. Brandon A.D., **Walker R.J.**, Morgan J.W. and Goles G.G. (2000) Re-Os isotopic evidence for early differentiation of the Martian mantle. *Geochim. Cosmochim Acta*. **64**, 4083-4095.

57. Czamanske G.K., Wooden J.L., **Walker R.J**., Fedorenko V.A., Simonov O.N., Budahn J.R. and Siems D.F. (2000) Geochemical, isotopic and SHRIMP age data for Precambrian basement rocks, Permian volcanic rocks, and sedimentary host rocks to the ore-bearing intrusions, Noril'sk-Talnakh District, Siberian Russia. *International Geology Review*, **42**, 895-927.

58. Begemann F., Ludwig K.R., Lugmair G.W., Min K.W., Nyquist L.E., Patchett P.J., Renne P.R., Shih C.-Y., Villa I.M. and **Walker R.J.** (2001) Towards and improved set of decay constants for geochronological use. *Geochim. Cosmochim Acta* **65**, 111-121.

59. Meisel T., **Walker R.J.**, Irving A.J., and Lorand J.-P. (2001) Osmium isotopic compositions of mantle xenoliths: a global perspective. *Geochim. Cosmochim Acta*. **65**, 1311-1323.

60. **Walker R.J.** and Stone W.R. (2001) Os isotope constraints on the origin of the 2.7 Ga Boston Creek flow, Ontario, Canada. *Chem. Geol.* **175**, 567-579.

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Sponsored Research Grants

(1990-92) "Rhenium-osmium isotopic investigations of meteorites". ($75,000) NASA, June 1990-June 1992. Principal Investigator

(1992-1994) "Rhenium-osmium isotopic investigations of meteorites". ($131,950) NASA, August 1992-July 1994. Principal Investigator

(1991-1992) "Acquisition of a thermal ionization mass spectrometer". ($225,000 matching funds), NSF. Principal Investigator w/ Prof. E.J. Krogstad.

(1992-1994) "Re-Os isotope investigations of ultramafic rocks". ($80,000) NSF. January 1992-June 1994. Principal Investigator.

(1994-1996) "Re-Os isotopic investigations of mantle-derived systems". ($110,000) NSF March 1994-February 1996. Principal Investigator.

(1994-1997) “Technical support for the Isotope Geochemistry Laboratory” ($110,000) NSF, March 1994-February 1997). Principal Investigator w/ Prof. E.J. Krogstad.

(1994-1996) "Rhenium-osmium isotopic investigations of meteorites". ($127,000) NASA, August 1994-July 1996. Principal Investigator.

(1994-1995) "Lithium isotope investigations of magmatic and environmental systems" ($24,865) NSF, March 1994-February 1995. Principal Investigator with Prof. E.J. Krogstad.

(1995) “Student support for the 3rd International Hutton Symposium” ($3000) NSF, May 1995-April 1996.

(1996-1998) "Geochemical and isotopic investigations of meteorites". ($128,000) NASA, August 1996-July 1998. Principal Investigator.

(1996-1998) "Re-Os isotopic investigations of mantle-derived systems". ($110,000) NSF March 1996-February 1998. Principal Investigator.

(1996-1997) “Collaborative research of the ^{190}Pt-^{186}Os system as a test of core-mantle interaction”. ($70,000) NSF, July 1996-June 1997. Principal Investigator.

(1997-2000) "Lithium Isotopic Investigations of Magmatic and Hydrothermal Systems". ($118,000) NSF, June 1997-May 2000. Principal Investigator with P.A. Candela.

(1997-1999) "Technical support for the Isotope Geochemistry Laboratory: Phase II". ($100,000) NSF, October 1997-Sept. 1999. Principal Investigator with C. Gallup.

(1997-1998) "Collaborative research of the ^{190}Pt-^{186}Os system as a test of core-mantle interaction". ($70,000) NSF, July 1997-June 1998. Principal Investigator.

(1998-2000) "Rhenium-Osmium isotope study of the mantle". ($130,000) NSF, March 1998-February 2000. Principal Investigator.

(1998-2001) "Isotopic and Geochemical studies of meteorites". ($200,000) NASA. August 1998-July 2001. Principal Investigator

(1998-2000) "^{187}Re/^{187}Os, ^{190}Pt/^{186}Os, ^{34}S/^{32}S isotopic systematics of the subcontinental mantle of the western US".($144,000) September 1998-August 2000. NSF, Principal Investigator with A. Brandon.

(1998-2000) "Collaborative research of the ^{190}Pt-^{186}Os system as a test of core-mantle interaction: phase III". ($222,000) NSF, July 1998-June 2000. Principal Investigator with J. Morgan.

(1998-1999) "Acquisition of a state of the art electron microprobe microanalyzer". ($195,000 total). NSF, PI- P. Piccoli, Co-investigator with M. Brown and P. Candela.

(1999-2000) "Acquisition of a state-of-the-art multi-collector inductively-couple plasma mass spectrometer". ($350,000 total). NSF.

(2000-2003) "Accomplishment Based Renewal-Re-Os isotope study of the mantle". ($236,257) NSF.

(2000-2001) "A Rhenium-Osmium study of alkaline basalts from Vesteris seamount and the Jan Mayen area in the North Atlantic" ($77,715) NSF. With Co-I H. Becker.

(2000-2002) "CSEDI: Collaborative Geochemical Research on the Deep Mantle" ($190,000) NSF, July 2000-June 2002. Principal Investigator.

(2001-2004) "Isotopic and Geochemical studies of meteorites". NASA. ($235,000). Principal Investigator.

(2001-2003) "^{186}Os Investigations into the Origins of Osmium in Seawater". NSF-OCE ($148,000) Principal Investigator.

(2002-2004) "Collaborative Research: Characterizing the Late Veneer". NSF-EAR ($175,657) Principal Investigator, with Co-I H. Becker.

(2004-2007) "CSEDI: Collaborative research: Development of geochemical tests for detection of core-mantle interaction." NSF ($323,423). Principal Investigator.

(2003-2005) "Characterizing eastern North American mantle using Re-Os". NSF ($198,487), co-PI with W. G. Minarik.

(2004-2007) "Rhenium-osmium isotope investigations of the Taitao ophiolite". NSF ($222,817). Principal Investigator.

(2004-2009) “Origin and Evolution of Organics in Planetary Systems”. NASA Astrobioligy, ~$75,000/yr (to RJW). Principal Investigator M. Mumma, (Goddard Spaceflight Center) (Walker is one of 20 Co-I’s).

(2004-2007) "Isotopic and Geochemical studies of meteorites". NASA. ($300,000). Principal Investigator.

(2006) “Acquisition of a State-of-the-Art Thermal Ionization Mass Spectrometer” NSF ($265,000).

(2006) “Acquisition of a State-of-the-Art Thermal Ionization Mass Spectrometer” NASA ($265,000).

(2007-2010) "Isotopic and Geochemical studies of meteorites". NASA. ($390,000). Principal Investigator.

(2008) “Acquisition of a High Pressure Asher”. NASA ($42,000). Principal Investigator

(2007-2009) “The Timing and Geometry of Lithosphere Removal Beneath the North China Craton”. NSF EAR ($200,000) co-PI with R. Rudnick.

(2008-2011) “Collaborative Research: CSEDI--Origin and Evolution of Highly Siderophile Elements in Earth's Mantle”. NSF EAR CSEDI ($342,883) Principal Investigator.

(2009-2013) “Impact Processes in the Origin and Evolution of the Moon: New Sample-driven Perspectives”, NASA NLSI ($435,000 to RJW). Principal Investigator D. Kring (Lunar & Planetary Institute)(Walker is one of ~10 co-I’s).

(2009-2012) “PGE, Re-Os and Lu-Hf isotopic signature of lithosphere removal beneath the North China Craton”, NSF EAR ($330,330) co-PI with R.L. Rudnick.

(2010-2014) “Origin and Evolution of Organics in Planetary Systems”. NASA Astrobioligy (~$375,000 to RJW). Principal Investigator M. Mumma, (Goddard Spaceflight Center) (Walker is one of ~20 Co-I’s).

(2010-2013) “Isotopic and Geochemical Investigations of Early Solar System Materials”, NASA, ($495,000). Principal Investigator.

(2011-2014) “Highly Siderophile Elements as Tracers of Mantle-crust Interactions in Subduction Zone Metamorphic Rocks”, NSF EAR ($300,027) co-PI with S. Penniston-Dorland.

(2012-2013) “Collaborative Research: CSEDI—Application of siderophile elements to mantle geodynamics”. NSF EAR CSEDI ($164,584) Principal Investigator.

(2013-2016) “Isotopic and Geochemical Investigations of Siderophile Elements in the Early Solar System”, NASA, ($600,000). Principal Investigator.

(2013-2014) “Acquisition of a State-of-the-Art Thermal Ionization Mass Spectrometer”, NSF IF ($325,000). Principal Investigator

(2013-2014) “Acquisition of a State-of-the-Art Thermal Ionization Mass Spectrometer”, NASA MPE ($225,000). Principal Investigator

(2013-2016) “Collaborative Research: CSEDI—Application of siderophile elements to early Earth processes and mantle mixing”. NSF EAR CSEDI ($370,184) Principal Investigator.

(2013-2018) “Inner Solar System Impact Processes: An Integrated Analysis Using Extraterrestrial Samples, Astronomical Observations, and Modeling”, NASA SSERVI, ($262,482 to RJW). Principal Investigator D. Kring (Lunar & Planetary Institute) (Walker is one of ~10 co-I’s).

(2014-2017) “Application of Siderophile Elements to the Study of the Chemical Structure and Mixing History of the Oceanic Mantle”, NSF EAR ($280,000) Principal Investigator.

(2016-2019) “Siderophile Element Studies of the Formation and Early Evolution of the Solar System”, NASA Emerging Worlds ($770,000) Principal Investigator.

(2017-2018) “Acquisition of a State-of-the-Art Multi-Collector Inductively-Coupled Plasma Mass Spectrometer”, NASA Planetary Major Equipment ($240,000) Principal Investigator.

(2016-2019) “Tungsten and Ruthenium Isotopic Study of the Chemical Evolution of Earth”, NSF EAR ($460,000) Principal Investigator, w/ K. Bermingham and A. Mundl co-I’s.

(2017-2018) “Acquisition of a State-of-the-Art Multi-Collector Inductively-Coupled Plasma Mass Spectrometer”, NSF Instrumentation and Facilities ($480,000) Principal Investigator.

(2020-2023) “Linking Genetic and Chemical Characteristics of the Early Solar System” NASA Emerging Worlds ($625,268) Principal Investigator.

(2020-2022) “Evaluating links between primordial mantle domains and deep mantle structures using ^{182}W and $^{3}He/^{4}He$. NSF EAR ($337,814) Co- PI w/ V. Finlayson.

(2020-2022) “Study of Mass Independent Isotopic Compositions of Ru and Mo in Early Earth Rocks”. NSF EAR ($317,425) Principal Investigator.

(2020-2022) “Characterizing Hafnium/Tungsten Ratios in Bulk Chondrites”. NASA Emerging Worlds ($242,588) Principal Investigator.

(2020-2022) “Characterizing the Genetics of Lunar Basin-Forming Impactors Using Ru Isotopes”. NASA Emerging Worlds ($337,863) Principal Investigator.

(2021-2024) “Spatiotemporal Variability of Tungsten-182 in the Hawaiian Plume”. NSF EAR ($383,720) Principal Investigator, V. Finlayson, Co-PI.

(2023-2026) “Evolution of the Chemical and Genetic Structure of the Protosolar Nebula as revealed by Iron Meteorites”. NASA Emerging Worlds ($683,710) Principal Investigator.

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Past and Present Students Advised

Undergraduate

Alex Smith (undergraduate research project) "Constraints on the genesis of sulfide mineral deposits in the Morgan Run Formation from Re-Os isotope analysis", completed Fall 1992.

George Knight (undergraduate research project) "An examination of the Ellicott City Granite", completed Spring 1993

Alice Daly (undergraduate research project) "The origin of black chondrules in enstatite chondrites", completed Fall 1993.

Carmala Garzione (undergraduate research project) Isotopic constraints on the origin of the King's Mountain, N.C., pegmatite, completed Spring 1994.

Steve Bertolo (undergraduate research project) Relations between phases of the Ellicott City Granodiorite, completed Spring 1994.

Dina Lambros (undergraduate research project) Cl-F trends in apatites external to the Tin Mountain pegmatite, completed Fall 1994.

Sheila Bettendorf (undergraduate research project) Cl-F trends in apatite from the Tin Mountain pegmatite, completed Fall 1994.

Jeffrey Hightower (undergraduate research project) Genetic relations in the Wissahickon Schist, completed Spring 1995.

Barbara Fowler (undergraduate research project) Re and Os metal-silicate partitioning, completed Spring 1996.

Blessing Asuquo (undergraduate research project) Re-Os systematics of ophiolite chromitites, completed Spring 1999.

Cliff Williams (undergraduate research project) Distribution of Pt in continental crustal materials. 2000-2001 (did not complete).

Brendan Puls (undergraduate research project) Os isotopic compositions of Chinese ophiolites. 2002-2003.

Amy Gelinas (undergraduate research project) Identification of impactor in Chicxulub melt breccias. 2002-2003.

Jeff Hillebrand (undergraduate research project) Partitioning of highly siderophile elements between silicate and metal in pallasite meteorites. 2003-2004.

Lynnette Picher (undergraduate research project) Fractionation of highly siderophile elements in the Kilauea Iki lava lake. 2005-2006.

Elena Chung (undergraduate research project) Fractionation of Mo isotopes via redox processes. Spring 2008.

Jesse Dietderich (undergraduate research project) Highly siderophile element systematics of group IIAB iron meteorites. 2009-2010.

Serge Muya (undergraduate research project) Trace element constraints on pegmatite evolution. 2010 and 2011 (did not complete).

Steve Ginley (undergraduate research project) Temporal comparison of chemical and isotopic characteristics of oceanic mantle. 2012-2013.

Adam McKeeby (undergraduate research project) A study of the subcontinental lithospheric mantle underlying west Antarctica. 2013-2014.

Jonathan Tino (undergraduate research project) A study of highly siderophile element distributions in H-chondrites. 2015.

Kyle Ludwig (undergraduate research project) A study of highly siderophile elements and Os isotopes in Gorgona Island, Colombia komatiites. 2016-2017.

Hope Tornabene (undergraduate research project) A study of group IIC iron meteorites. 2017-2018.

Braden Lense (undergraduate research project) A study of the origin of gold nuggets from Costa Rica and British Columbia. 2020-2021.

Masters

Alison Schwab. Assessment of lithium concentration and isotopic data as hydrologic tracers in a first-order catchment. Completed 1996.

Asuka Tsuru. The isotopic evolution of Os in the upper mantle: evidence from the Jormua Ophiolite Complex, Finland. Completed 1997.

Sarah Libeau. Tracing lead pollution in the Chesapeake Bay: evidence from sediments and oysters. Completed 1998.

Ji Li. A study of the Allegheny gold district ores using the Re-Os system. Completed 2001.

David Cook. Re-Os and Pt-Os studies of evolved iron meteorites. Completed 2001.

Nick Geboy (co-advised with A.J. Kaufman). Rhenium-osmium age determinations of glaciogenic shales from the Mesoproterozoic Vazante Formation, Brazil. Completed 2006.

Ruth Thompson Schulte. Isotopic systematics of the Taitao ophiolite, southern Chile. Completed 2007.

Gregory Archer. Re-Os isotopic and highly siderophile element studies of chondritic components. Completed 2012.

Caitlin Brown (co-advisor with M. Brown). Completed 2013.

Mitchell Haller. A comparative study of Proterozoic and Phanerozoic ophiolites. Completed 2017.

Tracey Centorbi. Re-Os and oxygen systematics of variably altered ultramafic rocks, North Carolina. Completed 2020.

Hope Tornabene. Age, genetics and crystallization of group IC and IIC iron meteorites. Completed 2020.

Emily Chiappe. Chemical and isotopic systematics of IIIE iron meteorites and ungrouped iron meteorites. Completed 2023.

Doctoral

Paul Tomascak, (Ph.D.) "The Petrogenesis of Granitic Rocks, southwestern Maine". (1991-1995). Completed 1995.

Michael Smoliar, (Ph.D.) "Re-Os systematics of iron meteorites". (1993-1996). Completed 1996.

Steve Lynton (Ph.D.) (co-advised with P.A. Candela) A study of Li isotopes in magmatic systems. Completed 2003.

Amitava Gangopadhyay (Ph.D.) Osmium isotopic study of komatiite sources. Completed 2004.

Thomas Ireland (Ph.D.) Highly siderophile element and tungsten systematics of Hawaiian picrites. Completed 2009.

Kathleen Scheiderich (Ph.D.) Molybdenum isotopes in water and sediments. Completed 2009.

Jingao Liu (Ph.D.) (co-advisor with R.L. Rudnick) Creation and destruction of lithospheric mantle beneath the North China Craton. Completed 2011.

Miriam Sharp (Ph.D.) Determination of siderophile element characteristics throughout luanr history: Implications for the lunar magma ocean and late heavy bombardment. Completed 2014.

Emily Worsham (Ph.D.) Siderophile elements and molybdenum, tungsten and osmium isotopes as tracers of planetary genetis and differentiation: implications for the IAB iron meteorite complex. Completed 2016

Gregory Archer (Ph.D.) Highly siderophile elements, ^{187}Re-^{187}Os and ^{182}Hf-^{182}W Isotopic systematics of early solar system materials: constraining the early evolution of chondritic and achondritic parent bodies. Completed 2016

Connor Hilton (Ph.D.) Genetics, ages, and chemical compositions of iron meteorites. Completed 2020

Lori Wilhite (Ph.D.) Spatiotemporal variability of tungsten-182 in the Hawaiian plume. (in progress)

Kiran Almas (Ph.D.) Refinement of methods to assess and correct for cosmic ray exposure effects upon iron meteorites. (in progress)

Emily Chiappe (Ph.D.) Exploration of nucleosynthetic “genetic” diversity of early Solar System objects, as revealed by isotopic anomalies present in ungrouped iron meteorites. (in progress)

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Post-doctoral Advising

Thomas Meisel (1995-1996)
Alan Brandon (1997-1999)
Tod Waight (1998-1999)
Harry Becker (1998-2001)
Diane McDaniel (2000-2003)
Aaron Pietruszka (2002-2003)
Seung Ryeol Lee (2004-2006)
Tetsuya Yokoyama (2005-2008)
James Day (2007-2010)
Mathieu Touboul (2009-2014)
Jingao Liu (2011-2012)
Hanika Rizo (2013-2015)
Katherine Bermingham (2012-2018)
Andrea Mundl (2015-2018)
Nao Nakanishi (2018-2022)
Valerie Finlayson (2018-present)
Jan Hellmann (2021-2024)
Soumya Ray (2022-2024)

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