

CURRICULUM VITAE

MARK DAVID KURZ

Senior Scientist
Department of Marine Chemistry and Geochemistry
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

Tel: (508) 289-2888
Fax: (508) 457-2193
E-mail: mkurz@whoi.edu

Citizenship: USA

Languages spoken: English, French

EDUCATION:

B.S., Chemistry (Honors), University of Wisconsin at Madison, 1976.

Ph.D., Geochemistry, Joint Program in Oceanography, MIT/WHOI, 1982.

Dissertation: *Helium isotope geochemistry of oceanic volcanic rocks: Implications for mantle heterogeneity and degassing* (WHOI 82-32). Advisor: W.J. Jenkins.

RESEARCH INTERESTS:

Isotope geochemistry of mantle derived rocks and minerals, and the origins of mantle heterogeneity.

Noble gas isotopes and the degassing history of the earth.

The production and distribution of cosmic ray generated nuclides in surficial rocks, and their application to exposure dating of quaternary surfaces and lava flows.

The glaciological and climatic history of Antarctica.

PROFESSIONAL EXPERIENCE:

NATO Postdoctoral Fellow, Universite Paris VII, Institut de Physique du Globe, 1982-1983.

Postdoctoral Advisor: Claude J. Allègre

Maitre de Conference Associé (Visiting Assistant Professor), Universite Paris VII, May, 1983-October, 1983.

Assistant Scientist, Woods Hole Oceanographic Institution, October, 1983-October, 1987.

Associate Scientist, Woods Hole Oceanographic Institution, November, 1987-November 1991.

Associate Scientist w/ tenure, Woods Hole Oceanographic Institution, Nov. 1991-June 1996.

Physicien Invité (Visiting Professor), Institut de Physique du Globe (Paris), May-June, 1995.

Senior Scientist, Woods Hole Oceanographic Institution, Woods Hole, MA, June 1996- present.

Department Chair, Marine Chemistry and Geochemistry, WHOI, March, 1999-May 2003.

Physicien Invité (Visiting Professor), Institut de Physique du Globe (Paris), January-July, 2004.

Professeur Invité (Visiting Professor), Université Paul-Sabatier, Toulouse France. April-June, 2006.

J. Seward Johnson Chair and Education Coordinator (Chemical Oceanography) WHOI Jan. 2009-present.

PROFESSIONAL AFFILIATION:

Member, American Geophysical Union

Member, Geochemical Society

AWARDS:

Undergraduate Analytical Chemistry Award, American Chemical Society, 1975.

Knapp Honors Research Scholar, University of Wisconsin, 1976.

NATO-NSF Postdoctoral Fellowship Award, 1981.

Ruth and Paul Fye Award for Excellence in Oceanographic Research, Woods Hole, MA, 1982.

F. W. Clarke Medal of the Geochemical Society, 1986.

Rosenstiel Award for Outstanding Achievement in Oceanographic Science, University of Miami, 1988.

Elected Fellow, American Geophysical Union, 1997

Lewis and Betty Scripps Chair in Oceanography, Woods Hole, 1997

Distinguished Alumni Award, University of Wisconsin, Department of Geology and Geophysics, 2009

EDUCATION/ADVISING, MIT/WHOI Joint Program unless otherwise noted:

Ph.D. Thesis Committee: D. Graham (1987), D. Phillips (Princeton, 1989), Erik Brown (1992), Jon Snow (1993), A. Saal (2000), Kristen Nicolayson (MIT, 2000), Jennifer Georgen (2001), R. Kelly (2003), L. Schoenbohm (MIT, 2004), P.H. Blard (Cerege-Marseilles, 2006), J. Standish (2007), Shichun Huang (MIT, 2007), M. Jackson (2007), G. Xu (MIT, 2007), A. Raquin (IPG-Paris, 2008), B. Goehring (Columbia U., 2010), S. Ali (Columbia U., 2010), C. Frame (2010), A. Noble (2011).

M.S. Thesis Committee: B. Diefenbach (Idaho, 2005), K. Schorzer (UNH, 2007), J. Deemer (Cal State LA, 2009), J. Amaya (UFF Brazil, 2010)

Undergraduate Advising: J. Swartz (U. Pittsburg, 2008), Nadine Reitman (Vassar, 2009), W. Cushman (Colgate, 2010), W. Schlitzer (Colgate, 2010)

Principal Ph.D. Advisor: T. W. Trull (1989), E. J. Brook (1993), R. P. Ackert (2000).

Post-doctoral Advisor: M. Polve (1985), T.Y. Yang (1993), B. Peucker-Ehrenbrink (1996), M. Moreira (1998), R. Ackert (2000), J. Licciardi (2001).

Courses taught: Marine Isotope Geochemistry 1987, 1991, 1992, 1994, 1996, 1998, 2000, 2002, 2003, 2007, 2011. Science and Society, 2008. Seminar in Chemical Oceanography, 2007, 2009.

COMMUNITY SERVICE

Member *ALVIN* Review Committee, May, 1986, Woods Hole, MA.

Steering committee for Deep Drill Hole in the Hawaiian Islands, consortium for DOSECC/NSF (1987).

National Science Foundation, Instrumentation and Facilities Review Panel 1994-1997

National Science Foundation, Antarctic Earth Sciences Review Panel, 2009-2010

American Geophysical Union, Committee on Public Affairs, 1994-1998

Editorial Board: *Geology*, 1994-1995; Guest Editor: *JGR, Chemical Geology*

National Academy of Sciences/National Research Council, Review Panel for Yucca Mountain Project (DOE), 1995

NSF Symposium organizer "Pliocene History of the Antarctic Ice Sheets", April 1995 in Woods Hole.

McMurdo Area Users Committee (1996-1998)

National Science Foundation, Science and Technology Center Review Panel, 1998

Steering committee CRONUS-US (Cosmic Ray Produced Nuclide Systematics on Earth) 2005-present

FIELD EXPERIENCE:

Seagoing:

1976: *R/V Alpha Helix*, Panama to Belem.

1977: *R/V Knorr*, Panama to Galapagos.

1980: *R/V Atlantis II*, Capetown to Rio de Janeiro.

1990: *R/V Kila* and *R/S Pisces V*, diving program near island of Hawaii*

1991: *R/V Kila* and *R/S Pisces V*, diving program on Southwest rift of Mauna Loa volcano

1999: *R/V Moana Wave*, dredging Mauna Loa

1999: *R/V Melville*, dredging the Samoan hotspot.

2000: *R/V Melville*, Western Galapagos*

2001: *R/V Revelle*, Western Galapagos*

2002: *R/V Thompson (ROV Jason II)*, Mauna Loa, Hawaii

2006: *R/V Melville, (ROV Jason II)*, Loihi Seamount, Hawaii

2008 *R/V Thompson, (ROV Jason II)*, Loihi Seamount, Hawaii*

2010 *R/V Melville*, Northern Galapagos

2011 *D/V Joides Resolution*, Expedition 335, Superfast Spreading crust

(* = chief, co-chief, or co-PI)

Field Studies of Ocean Island volcanism

Iceland (1983, 2002), Hawaii (1985, 1987, 1991, 1992, 2002, 2003; 2006; 2009), Azores (1988) Galapagos (1993, 1997, 1998).

Field studies of Antarctic glacial deposits and geomorphology, Trans Antarctic Mountains.

Team Leader (NSF/USAP, Science Group S-077, Dry Valleys, Austral summers 1989-90, 1990-91)

Team Leader (NSF/USAP, Science Group S-177, Dry Valleys, Austral summers 1992-93, 1993-94)

Team Leader (NSF/USAP, Science Group S-181, Shackleton Glacier, Austral summer 1995-96)

Team Leader (NSF/USAP, Science Group G-152, Dry Valleys, Austral summer 2007-8)

Field studies of Glacial deposits: Patagonia, Argentina, 1998; Western USA, 2001; Iceland, 2002; Hawaii, 2003; Alaska 2011

Field studies of Ophiolites: Josephine Ophiolite (August, 2010), Oman Ophiolite (January, 2011)

PUBLICATIONS in peer reviewed journals.

Kurz, M.D. and J.C. Wright (1977). Laser excitation of single ion and clustered ion sites in $\text{SrF}_2:\text{Er}^{3+}$. *Journal of Luminescence*, **15**, 169-186.

Kurz, M.D. and W.J. Jenkins (1981). The distribution of helium in oceanic basalt glasses. *Earth Planet. Sci. Lett.*, **53**, 41-54.

Kurz, M.D., W.J. Jenkins, J.G. Schilling, and S.R. Hart (1982). Helium isotopic variations in the mantle beneath the North Atlantic Ocean. *Earth Planet. Sci. Lett.*, **58**, 1-4.

Kurz, M.D., W.J. Jenkins, and S.R. Hart (1982). Helium isotopic systematics of oceanic islands: implications for mantle heterogeneity. *Nature*, **297**, 43-47.

Kurz, M.D. and W.J. Jenkins (1982). Helium partitioning in basaltic glass: reply to comment by R. Poreda. *Earth Planet. Sci. Lett.*, **59**, 439-440.

Kurz, M.D., W.J. Jenkins, S. Hart, and D. Clague (1983). Helium isotopic variations in Loihi Seamount and the island of Hawaii. *Earth Planet. Sci. Lett.*, **66**, 388-406.

Allegre, C.J., T. Staudacher, P. Sarda, and M. Kurz (1983). Constraints on evolution of Earth's mantle from rare gas systematics. *Nature*, **303**, 762-766.

Kurz, M. D., P. Meyer, and H. Sigurdsson (1985). Helium isotopic variability within the neovolcanic zones of Iceland. *Earth Planet. Sci. Lett.*, **74**, 291-305.

Kurz, M. D. (1986). Cosmogenic helium in a terrestrial igneous rock. *Nature*, **320**, 435-439.

Kurz, M. D. (1986). In-situ production of cosmogenic terrestrial helium and some applications to geochronology. *Geochim. Cosmochim. Acta*, **50**, 2855-2862.

Staudacher, T., M. D. Kurz, and C. J. Allegre (1986). New noble gas data on glass samples from Loihi seamount and Hualalai. *Chemical Geology*, **56**, 193.

Kurz, M. D. (1987). Acceptance of F. W. Clarke Award. *Geochim. Cosmochim. Acta*, **51**, 1771-1777.

Graham, D., W. J. Jenkins, M. D. Kurz, and R. Batiza (1987). Helium isotopic disequilibrium and geochronology of glassy submarine basalts. *Nature*, **326**, 384-386.

Kurz, M. D., J. J. Gurney, W. J. Jenkins, and D. E. Lott (1987). Helium isotopic variability within single diamonds from the Orapa Kimberlite. *Earth Planet. Sci. Lett.*, **86**, 57-68.

Kurz, M. D., M. O. Garcia, F. A. Frey, and P. A. O'Brien (1987). Temporal helium isotopic variations within Hawaiian volcanoes: basalts from Mauna Loa and Haleakala. *Geochim. Cosmochim. Acta*, **51**, 2905-2914.

- Graham, D. W., A. Zindler, M. D. Kurz, W. J. Jenkins, R. Batiza, and H. Staudigel (1988). He, Pb, Sr and Nd isotope constraints on magma genesis and mantle heterogeneity beneath young Pacific seamounts. *Contributions to Mineralogy and Petrology*, **99**, 446-463.
- Trull, T. W., M. R. Perfit, and M. D. Kurz (1989). He and Sr isotopic constraints on subduction contributions to Woodlark Basin volcanism, Solomon Islands. *Geochim. Cosmochim. Acta*, **54**, 441-453.
- Kurz, M. D., D. Colodner, T. W. Trull, R. Moore, and K. O'Brien (1990). Cosmic ray exposure dating with *in-situ* produced cosmogenic ^3He : Results from young Hawaiian lava flows. *Earth Planet. Sci. Lett.*, **97**, 177-189.
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- Trull, T. W., M. D. Kurz, and W. J. Jenkins (1991). Diffusion of cosmogenic helium in olivine and quartz: Implications for surface exposure dating. *Earth Planet. Sci. Lett.*, **103**, 241-246.
- Kurz, M. D. and D. P. Kammer (1991). Isotopic evolution of Mauna Loa Volcano. *Earth Planet. Sci. Lett.*, **103**, 257-269.
- Brown, E. T., J. M. Edmond, G. M. Raisbeck, F. Yiou, M. D. Kurz, and E. J. Brook (1991). Examination of surface exposure ages of Antarctic Moraines using *in-situ* produced Beryllium-10 and Aluminium-26. *Geochim. Cosmochim. Acta*, **55**, 2269-2283.
- Kurz, M. D. (1991). Noble gas isotopes in oceanic basalts: Controversial constraints on mantle models. Chapter 8, in: *Short Course Handbook On Applications of Radiogenic Isotope Systems To Problems In Geology*, L. Heaman and J. N. Ludden, eds., Mineralogical Association of Canada, Toronto, 259-286, 1991.
- Graham, D. W., W. J. Jenkins, J.-G. Schilling, G. Thompson, M. D. Kurz, and S. E. Humphris (1992). Helium isotope geochemistry of mid-ocean ridge basalts from the South Atlantic. *Earth Planet. Sci. Lett.*, **110**, 133-147.
- Graham, D.W., S.E. Humphris, W.J. Jenkins, and M.D. Kurz (1992). Helium isotope geochemistry of some volcanic rocks from Saint Helena. *Earth Planet. Sci. Lett.*, **110**, 121-131.
- Brown, E.T., E.J. Brook, G.M. Raisbeck, F. Yiou, and M.D. Kurz (1992). Effective attenuation lengths of cosmic rays producing ^{10}Be and ^{26}Al in quartz: Implications for exposure age dating. *Geophys. Res. Lett.*, **19**(4), 369-372.
- Kurz, M.D. (1993). Mantle heterogeneity beneath oceanic islands: some inferences from isotopes. *Phil. Trans. R. Soc. Lond.*, **A342**, 91-103.
- Trull, T.W. and M.D. Kurz (1993). Diffusivity of ^3He and ^4He in olivine and clinopyroxene at magmatic and mantle temperatures. *Geochim. Cosmochim. Acta*, **57**, 1313-1324.

- Brook, E.J., M.D. Kurz, R.P. Ackert, and G.H. Denton (1993a). Chronology of Taylor Glacier advances in Arena Valley using in situ produced cosmogenic helium-3. *Antarctic Journal of the United States* (1991 Review) XXVI (No 5), 82-85.
- Brook, E.J. and M.D. Kurz (1993). Surface-exposure chronology using *in-situ* cosmogenic ^3He in Antarctic quartz sandstone boulders. *Quaternary Research*, **39**, 1–10.
- Brook, E.J., M.D. Kurz, R.P. Ackert, Jr., G.H. Denton, E.T. Brown, G.M. Raisbeck, and F. Yiou (1993). Chronology of Taylor Glacier Advances in Arena Valley, Antarctica, using *in situ* cosmogenic ^3He and ^{10}Be . *Quaternary Research*, **39**, 11–29.
- Kurz, M.D., E.J. Brook, and R.P. Ackert, Jr. (1993). High altitude volcanic outcrops in the Kukri Hills, Southern Victoria Land. *Ant. J. U.S.*, (1991 Review) XXVI (No. 5) 30-31.
- Kurz, M.D., E.J. Brook, and R.P. Ackert, Jr. (1993). Surface-exposure dating of Antarctic glacial deposits. *Ant. J. U.S.*, (1991 Review) XXVI (No. 5) 85-86.
- Mahoney, J.J., J.M. Sinton, M.D. Kurz, J.D. Macdougall, K.J. Spencer, and G.W. Lugmair (1994). Isotope and trace element characteristics of super fast spreading ridge: East Pacific Rise, 13–23°S. *Earth Planet. Sci. Lett.*, **121**, 173-193.
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- Kurz, M.D., T. Kenna, D. Kammer, J. M. Rhodes, and M.O. Garcia (1995) Isotopic evolution of Mauna Loa volcano: a view from the submarine south west rift. *Mauna Loa Revealed: Structure, Composition, History, and Hazards* AGU monograph #92 (J.P. Lockwood and J.M. Rhodes, eds), p289-306.
- Brook, E. J., E. T. Brown, M. D. Kurz, R. P. Ackert, Jr., G. M. Raisbeck and F. Yiou (1995). Constraints on age, erosion and uplift of Neogene glacial deposits in the Transantarctic Mountains determined from in situ cosmogenic ^{10}Be and ^{26}Al . *Geology*, **23**, 1063-1066.
- Reynolds, R.W., D. Geist, and M.D. Kurz (1996). Physical volcanology and structural development of Sierra Negra volcano, Isabela Island, Galapagos Archipelago. *Bulletin of the Geological Society of America*, **107**, 1398-1410.
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- Hauri, E. H., and M.D. Kurz (1997). Melt migration and mantle chromatography: A time series Os isotope study of Mauna Loa volcano, Hawaii. *Earth Planet. Sci. Lett.* **153**, 21-36.
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- Kurz, M.D., A. le Roex, H. Dick (1998) Isotope geochemistry of the mantle beneath the Bouvet Triple Junction. *Geochimica Cosmochimica Acta*, **62**, 841-852.
- Standish, J, D. Geist, K. Harpp, and M.D. Kurz (1998) The emergence of a Galapagos Shield volcano, Roca Redonda. *Contrib. Mineral. Petrol.* **133**, 136-148.
- Ackert, R.P., D.J. Barclay, H.W. Borns, P.E. Calkin, M.D. Kurz, E.O. Steig, and J.L. Fastook (1999) Geologic constraints on Ice Sheet Elevations in Interior West Antarctica. *Science*, **286**, 276-280.
- Kurz, M.D. and D. Geist (1999). Dynamics and evolution of the Galapagos hotspot from helium isotope geochemistry. *Geoch. Cosmoch. Acta*, **63**, 4139-4156.
- Licciardi, J.M., M.D. Kurz, P.U. Clark and E.J. Brook (1999). Calibration of cosmogenic ^3He production rates from holocene lava flows in Oregon, USA, and effects of the Earth's magnetic field. *Earth and Planetary Science Letters*, **172**, 261-271.
- Moreira, M., R. Doucelance, M. D. Kurz, B. Dupré, and C.J. Allègre(1999) Helium and lead isotope geochemistry of the Azores Archipelago. *Earth. Planet. Sci. Letts.*, **169**, 189-205.
- Trull, T.W. and M.D. Kurz (1999). Isotopic fractionation accompanying helium diffusion in basaltic glass. *J. of Molecular Structures*, 485-486 (0), 555-567.
- Breddam, K., M.D. Kurz and M. Storey (2000). Mapping the conduit of the Iceland mantle plume with helium isotopes. *Earth and Planetary Science Letters*, **176**, 45-55.
- Brook, E.J. M.D. Kurz, J. Curtice, and S. Cowburn (2000). Accretion of interplanetary dust in polar ice. *Geophysical Research Letters*, **27** (19), 3145-3148.
- Gregg, T.K.P., D.J. Fornari, M.R. Perfit, W.I. Ridey and M.D. Kurz (2000). Using submarine lava pillars to record mid-ocean ridge eruption dynamics. *Earth and Planetary Science Letters*, **178**, 195-214.
- Hart, S. R., H. Staudigel, A. A. P. Koppers, J. Blusztajn, E. T. Baker, R. Workman, M. Jackson, E. Hauri, M. Kurz, K. Sims, D. Fornari, A. Saal, and S. Lyons, (2000) Vailulu'u undersea volcano: The New Samoa, *Geochem. Geophys. Geosyst.*, **1**, Paper number 2000GC000108, Published December 8, 2000.
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- Moreira, M., C. Gautheron, K. Breddam, J. Curtice and M.D. Kurz (2001). Solar neon in the Icelandic mantle: New evidence for an undegassed lower mantle. *Earth and Planetary Science Letters*, **185**, 15-23.
- Moreira, M. and M.D. Kurz (2001). Subducted oceanic lithosphere and the origin of the 'high μ ' basalt helium isotopic signature. *Earth and Planetary Science Letters*, **189**, 49-57.
- Naumann, T., D. Geist, and M.D. Kurz (2001) Petrology and Geochemistry of Volcán Cerro Azul: Petrologic Diversity among the Western Galápagos Volcanoes, *Journal of Petrology*, **43**, 859-883.

- Geist, D., W.M. White, F. Albarede, K. Harpp, R. Reynolds, J. Blichert-Toft, M.D. Kurz (2002). Volcanic evolution in the Galápagos: The dissected shield of Volcan Ecuador. *Geochemistry Geophysics Geosystems*, **3** (10), 1061, doi:10.1029/2002GC000355.
- Ackert, R.P., Jr, B.S. Singer, H. Guillou, M.R. Kaplan and M.D. Kurz (2003) Long-term cosmogenic ^3He production rates from $^{40}\text{Ar}/^{39}\text{Ar}$ and K-Ar dated Patagonian lava flows at 47°S. *Earth and Planetary Science Letters*, **210** (1-2), 119-136.
- Georgen, J.E, M.D. Kurz, H.J.B. Dick and J. Lin (2003) Low $^3\text{He}/^4\text{He}$ ratios in basalt glasses from the western Southwest Indian Ridge (10°-24°E). *Earth and Planetary Science Letters*, **206** (3-4), 509-528.
- Harpp, K.S., D.J. Fornari, D.J. Geist, and M.D. Kurz (2003) Genovesa Submarine Ridge: A manifestation of Plume-Ridge interaction in the Northern Galapagos Islands, *Geochem. Geophysics. Geosystems* (G-cubed), AGU, **4** (9), 8511, doi:10.1029/2003GC000531, 2003.
- Moreira, M., J. Blusztajn, J. Curtice, S. Hart, H. Dick, and M.D. Kurz (2003) He and Ne isotopes in oceanic crust: implications for noble gas recycling in the mantle. *Earth and Planetary Science Letters*, **216**, 635-643.
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- Kurz, M.D., J. Curtice, D.E. Lott, and A. Solow (2004). Rapid helium isotopic variability in Mauna Kea shield lavas from the Hawaiian Scientific Drilling Project. *Geochem. Geophysics. Geosystems* (G-cubed), AGU. 5, Q04G14, doi:10.1029/2002GC000439.
- Staudigel, H., S.R. Hart, A.A.P. Koppers, C. Constable, R. Workman, M. Kurz, E.T. Baker (2004). Hydrothermal Venting at Vailulu'u Seamount: The Smoking End of the Samoan Chain. *Geochem. Geophysics. Geosystems* (G-cubed), AGU. 5, Q02003, doi:10.1029/2003GC000626.
- Workman R. K., S. R. Hart, M. Jackson, M. Regelous, K. A. Farley, J. Blusztajn, M. Kurz, H. Staudigel (2004), Recycled metasomatized lithosphere as the origin of the Enriched Mantle II (EM2) end-member: Evidence from the Samoan Volcanic Chain, *Geochem. Geophys. Geosyst.*, **5**, Q04008, doi:10.1029/2003GC000623.
- Ackert, R. P., Jr., and Kurz, M.D. (2004) Age and uplift rates of Sirius Group sediments in the Dominion Range, Antarctica, from surface exposure dating and geomorphology: *Global and Planetary Change*. Vol. 42 p. 207-225.
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