

## ELIZABETH COTTRELL

(Married & Legal Name: Elizabeth Stevenson)

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### EDUCATION

- 2004 Ph.D. Columbia University, at Lamont Doherty Earth Observatory  
Department of Earth and Environmental Sciences  
Dissertation: *Differentiation of the Earth from the Bottom Up: Core, Mantle and Crust*  
Advisors: David Walker, Charles Langmuir, and Marc Spiegelman
- 1997 Sc.B. Brown University, Geological Sciences, Geochemistry with Honors  
Thesis: *Petrologic and experimental evidence for the movement and heating of the pre-eruptive Minoan rhyodacite (Santorini, Greece)*; Advisor: Malcom Rutherford
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### POSITIONS HELD

- 2022-present Chair, *Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, D.C*
- 2016-present Curator-In-Charge of the National Rock and Ore Collections, *Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, D.C*
- 2010-2016 Director of the Global Volcanism Program, *Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, D.C.*
- 2006-present Research Geologist, *Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution, Washington, D.C.*
- 2005-2006 Postdoctoral Fellow, *Carnegie Institution of Washington, Geophysical Lab*
- 2004-2005 Columbia Science Fellow, *Columbia University*  
Designed and taught a new course, *Frontiers of Science*, in its inaugural year as part of the Columbia University Core Curriculum.
- 2004 AAUW Dissertation Fellow, American Association of University Women, *Columbia University, Lamont Doherty Earth Observatory*
- 1998-2003 NSF Graduate Research Fellow, *Columbia University, Lamont Doherty Earth Observatory*
- 1997-1998 Fulbright Scholar, *L'Institute du Physique du Globe, University of Paris VII*  
Marginal Stability of Layered Miscible Fluids, Advisor: Claude Jaupart

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## HONORS, AWARDS, & FELLOWSHIPS

2023	Geochemistry Fellow of the Geochemical Society and the European Association for Geochemistry
2016	Fellow of the Mineralogical Society of America
2014	Peer Recognition Award, <i>Smithsonian Institution</i>
2014	Science Achievement Award, <i>Smithsonian Institution</i>
2014-2016	Distinguished Lecturer, NSF's Geodynamics at Rifting and Subducting Margins (GeoPRISMS) program
2012-2013	Distinguished Lecturer, NSF's Consortium for Materials Properties Research in Earth Sciences (COMPRES) program
2009	Science Achievement Award, <i>Smithsonian Institution</i>
2005	Carnegie Postdoctoral Fellowship, <i>Carnegie Institution of Washington, Geophysical Lab</i>
2004	Columbia Science Fellowship, <i>Columbia University</i>
2003	American Association of University Women Educational Foundation Dissertation Award
1998-2002	National Science Foundation Graduate Research Fellowship
1997-1998	Fulbright Fellowship (Paris, France)
1997	Anna Crosby Emery Prize – (declined), <i>Brown University</i>
1997	Outstanding Student Award – Geological Sciences, <i>Brown University</i>
1997	Columbia University Fellowship (declined), <i>Columbia University</i>
1996-1997	NASA Rhode Island Space Grant Fellowship
1996	Society of Royce Fellows Research Fellowship, <i>Brown University</i>
1996	Research Experience for Undergraduates Fellowship, <i>Brown University</i>
1995	Undergraduate Research and Teaching Assistantship, <i>Brown University</i>
1993	Department of Energy Honors Program, Representative for the State of Vermont, National Synchrotron Light Source, Brookhaven National Laboratory, Brookhaven, NY.

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## SELECTED EXTERNAL PROFESSIONAL SERVICE (LAST 12 YEARS)

2024	Member, Merit Award of the French Society of Mineralogy and Crystallography (SFMC) Selection Committee
2022-present	Member, MSA Roebling Medal Committee
2021-present	Pod Leader (2021-2022) and Member, URGE: Unlearning Racism in the Geosciences
2018-2023	Chair (2022, 2023) & Member (2018-2021), AGU VGP Section, Bowen Awards Committee
2021-2022	Chair of PI Search Committee; Member, Science Vision Team; Member, Steering Committee for the Management and Operations of Synchrotron-Hosted Analytical Capabilities for Earth Sciences Research

2021 President, Geological Society of Washington (elected position)

2021 Theme Chair for the 2021 Goldschmidt Conference (Lyon, France)

2021 Chair, Ethics Committee, Geochemical Society

2019-2021 Board Member representing North America, Geochemical Society (elected position)

2019-2021 Member, Steering Committee, NSF Research Collaboration Network “CONVERSE”

2010-2021 Director, NSF-REU Site: Natural History Research Experiences, EAR-1062692, OCE-1560088

2016-2020 Member, Mineralogical Society of America Awards Committee

2016-2019 Member, Deep Carbon Observatory (DCO) Task Force 2020

2018 Theme Chair for the 2018 Goldschmidt Conference (Boston, MA, USA)

2016-2018 Member, Consortium for Materials Properties Research in Earth Sciences (COMPRES) Nominating Committee

2015 Chairperson, Toward a 4D Planetary Carbon Model Workshop, May 13-15

2013-2015 Member, Consortium for Materials Properties Research in Earth Sciences (COMPRES) Infrastructure and Development Committee

2013 Chairperson and Lead Writer, NSF Earthcube End-Users Domain Workshop: Petrology, Geochemistry and Volcanology. National Museum of Natural History, March 6-7

2013-2014 Member, American Geophysical Union’s Union Medal Selection Committee

2012-2013 Chair, Program Committee of the Geochemical Society

2011-present Member, Management Board and Scientific Steering Committee of the Global Volcano Model (GVM)

2011-2019 Member, Scientific Steering Committee of the Deep Carbon Observatory (DCO)

2011-2018 Engagement Liaison to the Reservoirs and Fluxes Directorate of the Deep Carbon Observatory (DCO) / Engagement Advisory Committee

2010-2011 Chair, Program Committee, Geological Society of Washington

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**FIELD EXPERIENCE**

2015 Chief Scientist, NSF Shared Platform R/V Maritime Maid, Leg 3, Western Aleutians

2001 Shipboard Scientist, R/V Melville; Igneous Petrologist, COOK16MV, 12°-15°30’S Pacific. GLIMPSE (Gravity Lineations, Intraplate Melting Petrologic and Seismic Experiment.)

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**PROFESSIONAL SOCIETIES**

Geochemical Society (Fellow, 2023-;Chair of the Program Committee 2012-2013; Board Member Representing North America, elected 2019-2021; Chair of the Ethics Committee 2021) ▪ American Geophysical Union (Bowen Award Committee Member, Chair) ▪ American Association of University Women ▪ Society of Royce Fellows ▪ Geological Society of Washington (Council Member 2007-2008, Judging Committee 2006; Program Committee Chair 2010-2011; Second Vice President 2019; First Vice President 2020; President 2021) ▪ Mineralogical Society of America (Fellow, 2016-; Member, MSA Award Committee & Roebling Medal Committee)

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REFEREED JOURNAL ARTICLES

(SPECIAL INDICATIONS: †STUDENT, ‡POSTDOCTORAL ADVISEE OR \*EMPLOYEE)

- ‡Hollycross, M. and **Cottrell, E.**, Ague, J., Lanzirotti, A., Newville, M., “Fe K $\alpha$  XANES, Fe K $\beta$  HERFD XANES and EPMA flank method determinations of the oxidation state of Fe in garnet,” *Chemical Geology*, 647, 121937. 2024.  
<https://doi.org/10.1016/j.chemgeo.2024.121937>
- ‡Hollycross, M. and **Cottrell, E.**, “Garnet crystallization does not drive oxidation at arcs,” *Science*, 380, 506–509. 2023. DOI:10.1126/science.ade3418
- ‡Muth, M. and **Cottrell E.**, “No detectable redox exchange between sulfur and iron during rapid cooling of basalts,” *Earth and Planetary Science Letters*, 616, 2023. DOI:  
<https://doi.org/10.1016/j.epsl.2023.118210>
- ‡Jackson, C.J.M. and **Cottrell E.**, “Nitrogen partitioning between silicate phases and aqueous fluid depends on concentration,” *Geochimica et Cosmochimica Acta*, 354, p. 1-12. 2023. DOI: <https://doi.org/10.1016/j.gca.2023.05.017>
- Pourret, O., Anand, P. Bots, P., **Cottrell, E.**, Dosseto, A., Gunter, A., Hedding, D.W., Ibarra, D.E., Irawan, D.E., Johannesson, K., “Evolution of diversity in the editorial boards of *Geochimica et Cosmochimica Acta* and *Chemical Geology*,” *European Science Editing*, 48, 2022. DOI: <https://doi.org/10.3897/ese.2022.e89470>
- ‡Pistone, M., Formo, E., Whittington, A.G., Herbst., T., Cottrell, E., “Direct nanoscale observations of degassing-induced crystallisation in felsic magmas,” *Contributions to Mineralogy and Petrology*, 177(3), 1-21, 2022. doi: <https://doi.org/10.1007/s00410-022-01900-1>
- Ague, J.J., Tassara, S., ‡Hollycross, M.E., Li, J-L., **Cottrell, E.**, Schwarzenbach, E.M., Fassoulas, C., John, T., “Slab-derived devolatilization fluids oxidized by subducted metasedimentary rocks,” *Nature Geoscience*, 15(4), 320-326, 2022. doi: <https://doi.org/10.1038/s41561-022-00904-7>
- ‡Hollycross, M. and **Cottrell E.** 2022. “Experimental quantification of vanadium partitioning between eclogitic minerals (garnet, clinopyroxene, rutile) and silicate melt as a function of temperature and oxygen fugacity.” *Contributions to Mineralogy and Petrology*, 177:21. 2022. <https://doi.org/10.1007/s00410-022-01888-8>
- Fischer T.P., Lopez T.M., Aiuppa A., Rizzo A.L., Ilanko T., Kelley K.A. and **Cottrell E.** (2021),” Gas Emissions from the Western Aleutians Volcanic Arc. *Front. Earth Sci.* 9:786021. doi: 10.3389/feart.2021.786021
- ‡Jackson, C.R.M., **Cottrell, E.**, Du, Z., Bennett, N.N., Fei, Y., “High pressure redistribution of nitrogen and sulfur during planetary differentiation.” *Geophysical Perspectives Letters*. (18) p. 37-42. 2021
- ‡Davis, F.A. and **Cottrell, E.**, “Partitioning of Fe<sub>2</sub>O<sub>3</sub> in peridotite partial melting experiments over a range of oxygen fugacities elucidates ferric iron systematics in mid-ocean ridge basalts and the ferric iron content of the upper mantle. *Contributions to Mineralogy and Petrology* 176 (9), 1-17. 2021.

- <sup>†</sup>Birner, S.K, **Cottrell, E.**, Warren, J.M., Kelley, K.A., Davis, F.A. “Melt addition at ridges increases spinel Cr# with no effect on recorded oxygen fugacity.” *Earth and Planetary Science Letters* 566, 116951. 2021.
- <sup>‡</sup>Waters, L.A., **Cottrell, E.**, Coombs, M. and Kelley, K.A. “Generation of Calc-Alkaline Magmas During Crystallization at High Oxygen Fugacity: Experimental and Petrologic Study of Tephros from Buldir Volcano, Western Aleutian Arc, Alaska, USA. *Journal of Petrology*, 62 (3), ega104. 2021.
- Cottrell, E.**, <sup>†</sup>S. Birner, <sup>†</sup>M. Brounce, F. A. <sup>‡</sup>Davis, <sup>‡</sup>L. E. Waters and K. A. Kelley. “Oxygen Fugacity Across Tectonic Settings.” AGU Geophysical Monograph: Redox variables and mechanisms in magmatism and volcanism. D. R. Neuville and R. Moretti, Wiley. <https://doi.org/10.1002/9781119473206.ch3>. 2021.
- Cottrell, E.**, <sup>†</sup>S. Birner, <sup>†</sup>M. Brounce, F. A. <sup>‡</sup>Davis, <sup>‡</sup>L. E. Waters and K. A. Kelley. “EarthChem Library: Oxygen Fugacity Across Tectonic Settings. Version 1.0.” Interdisciplinary Earth Data Alliance (IEDA). <http://doi.org/10.26022/IEDA/111899>. 2021.
- <sup>†</sup>Brounce M, Reagan M.K., Kelley K.A., **Cottrell E.**, Shimizu K., Almeev R. “Covariation of Slab Tracers, Volatiles, and Oxidation During Subduction Initiation.” *Geochemistry, Geophysics, Geosystems* 22 (6), e2021GC009823. 2021.
- Rose-Koga EF, Bouvier A-S, Gaetani GA, Wallace PJ, Allison CM, <sup>†</sup>Andrys JA, Angeles de la Torre CA, Barth A, Bodnar RJ, Bracco Gartner AJJ, Butters DA, Castillejo A, Chilson-Parks B, Choudhary BR, Cluzel N, Cole M, **Cottrell E**, Daly A, Danyushevsky LV, DeVitre CL, Drignon MJ, France L, Gaborieau M, Garcia MO, Gatti E, Genske FS, Hartley ME, Hughes EC, Iveson AA, Johnson ER, Jones M, Kagoshima T, Katzir Y, Kawaguchi M, Kawamoto T, Kelley KA, Koornneef JM, Kurz MD, Laubier M, Layne GD, Lerner A, Lin K-Y, Liu P.-P, Lorenzo-Merino A, Luciani N, Magalhães N, Marschall HR, Michael PJ, Monteleone BD, Moore LR, Moussallam Y, <sup>‡</sup>Muth M, Myers ML, Narvaez DF, Navon O, Newcombe ME, Nichols ARL, Nielsen RL, Pamukcu A, Plank T, <sup>‡</sup>Rasmussen DJ, Roberge J, Schiavi F, Schwartz DM, Shimizu Kei, Shimizu K, Shimizu N, Thomas JB, Thompson GT, <sup>‡</sup>Tucker JM, Ustunisik G, Waelkens C, Zhang Y, Zhou T, “Silicate melt inclusions in the new millennium: A review of recommended practices for preparation, analysis, and data presentation.” *Chemical Geology*.120145. 2021.
- <sup>‡</sup>Jackson, C.R.M, **Cottrell, E.**, and Andrews, B. “Warm and oxidizing slabs limit ingassing efficiency of nitrogen to the mantle.” *Earth and Planetary Science Letters*. <https://doi.org/10.1016/j.epsl.2020.116615> 2021.
- <sup>‡</sup>Fischer, R.A., **Cottrell, E.**, Hauri, E., Lee, K.K., and <sup>‡</sup>Le Voyer, M. “The carbon content of Earth and its core.” *Proceedings of the National Academy of Sciences*. [doi/10.1073/pnas.1919930117](https://doi.org/10.1073/pnas.1919930117). 2020.
- <sup>‡</sup>Holycross, M., and **Cottrell, E.** “Partitioning of V and 19 other trace elements between rutile and silicate melt as a function of oxygen fugacity and melt composition: Implications for subduction zones.” *American Mineralogist: Journal of Earth and Planetary Materials*, 105(2), 244-254. 2020.

- <sup>†</sup>Brounce, M., **Cottrell, E.**, and Kelley, K.A. “The redox budget of the Mariana subduction zone.” *Earth and Planetary Science Letters*, 528, 115859. 2019.
- <sup>‡</sup>Le Voyer, M., Hauri, E.H., **Cottrell, E.**, Kelley, K.A., Salters, V.J., Langmuir, C.H., Hilton, D.R., Barry, P.H., and Füri, E. Carbon Fluxes and Primary Magma CO<sub>2</sub> Contents Along the Global Mid-Ocean Ridge System. *Geochemistry, Geophysics, Geosystems*, 20(3), 1387-1424. 2019.
- McCammon, C., Bureau, H., Cleaves, H., **Cottrell, E.**, Dorfman, S., Kellogg, L., Li, J., Moussallam, Y., Sanloup, C., and Thomson, A. “Deep Earth Carbon Reactions Through Time and Space.” *American Mineralogist. Journal of Earth and Planetary Materials*. 2019.
- Hauri, E.H., **Cottrell, E.**, Kelley, K.A., Tucker, J.M., Shimizu, K., <sup>‡</sup>Le Voyer, M., Marske, J., and Saal. “Carbon in the Convecting Mantle,” in *Whole Earth Carbon: Past to Present*. Orcutt, B. Daniel, I., and Dasgupta. R., Eds. Cambridge University Press supported by the Alfred P. Sloan Foundation. 2019.
- Werner, C., Fischer, T.P., Aiuppa A., Edmonds, M., Cardellini, C., Carn, S., Chiodini, G., **Cottrell, E.**, Burton, M., Shinohara, H., Allard, P. “Carbon Dioxide Emissions from Subaerial Volcanic Regions: Two Decades in Review.” In *Whole Earth Carbon: Past to Present*, Orcutt, B. Daniel, I., and Dasgupta. R., Eds. Cambridge University Press supported by the Alfred P. Sloan Foundation. 2019.
- Cottrell, E.**, Lanzirrotti, A., Mysen, B., <sup>†</sup>Birner, S.K, Kelley, K.A., Botcharnikov, R., Davis, F.A., Newville, M., “A Mössbauer-based XANES calibration for hydrous basalt glasses reveals radiation induced oxidation of Fe.” *American Mineralogist*. 103 (4): 489-501. 2018.
- <sup>‡</sup>Jackson, C.R.M., Bennett, N.N., Du, Z., **Cottrell, E.**, Fei, Y., “Early episodes of high-pressure core formation preserved in plume mantle.” *Nature*. 553(7689), 491. 2018.
- <sup>‡</sup>Davis, F.A. and **Cottrell E.**, “Experimental investigation of basalt and peridotite oxybarometers: implications for spinel thermodynamic models and Fe<sup>3+</sup> compatibility during generation of upper mantle melts.” *American Mineralogist* **103**: p. 1056-1067. 2018.
- <sup>†</sup>Zhang, H.L., **Cottrell, E.**, Kelley, K.A., and Hirschmann, M.M., “Determination of Fe<sup>3+</sup>/ΣFe of XANES basaltic glass standards by Mössbauer spectroscopy and its application to the oxidation state of iron in MORB.” *Chemical Geology*. 479(02). 2018.
- <sup>†</sup>Birner, S.K, **Cottrell, E.**, Warren, J.M., Kelley, K.A., Davis, F.A., “Peridotites and basalts reveal broad congruence between two independent records of mantle f<sub>o2</sub> despite local redox heterogeneity.” *Earth and Planetary Science Letters*. 494: p. 172-189. 2018.
- <sup>†</sup>Birner, S.K, Warren, J.M., **Cottrell, E.**, Davis, F.A., Kelley, K.A., and Falloon, T.J. “Forearc Peridotites from Tonga Record Heterogeneous Oxidation of the Mantle During Subduction Initiation.” *Journal of Petrology*. 58 (9), 1755-1780. 2017.
- Ebmeier, S.K., Andrews, B.J., Araya, M.C., Arnold, D.W.D., Biggs, J., Cooper, C., **Cottrell, E.**, Furtney, M., Hickey, J., Jay, J., Lloyd, R., Parker, A.L., Pritchard, M.E., Robertson, E. R., Venzke, E., and Willimanson, J.L. “Synthesis of global satellite observations of magmatic and volcanic deformation: implications for volcano monitoring & the lateral extent of magmatic domains.” *Journal of Applied Volcanology*. 7 (1), 2. 2017.

- <sup>†</sup>Grocke, S.B., de Silva, S.L., Wallace, P.J. **Cottrell, E.**, Schmitt, A.K. “Magmatic Heterogeneity and Eruption Dynamics in Catastrophic Caldera-Forming (CCF) Monotonous Intermediate Magma Reservoirs: Constraints from Volatiles in Melt Inclusions from the 3.49 Ma Tara Supereruption, Guacha II Caldera, SW Bolivia.” *Journal of Petrology* 58.11 (2017): 2115-2142.
- <sup>‡</sup>Pistone, M., Whittington, A., Andrews, B., and **Cottrell, E.**, “Crystal-rich Lava Dome Extrusion During Vesiculation: An Experimental Study.” *Journal of Volcanology and Geothermal Research*. 347, 1-14. 2017.
- <sup>†</sup>Grocke, S.B., De Silva, S.L., Iriarte, R., Lindsay, J. M., **Cottrell, E.**, “Catastrophic Caldera-Forming (CCF) Monotonous Silicic Magma Reservoirs: Geochemical and Petrological Constraints on Heterogeneity, Magma Dynamics, and Eruption Dynamics of the 3· 49 Ma Tara Supereruption, Guacha II Caldera, SW Bolivia.” *Journal of Petrology*, 58(2), p. 227-260. 2017.
- <sup>†</sup>Zhang, H.L., Hirschmann, M.M., **Cottrell, E.**, Withers, A.C. “Effect of pressure on Fe<sup>3+</sup>/ΣFe ratio in a mafic magma and consequences for magma ocean redox gradients.” *Geochimica et Cosmochimica Acta.*, 204, p 83-103. 2017.
- Helz, R.T., **Cottrell, E.**, Kelley, K.A. and <sup>†</sup>Brounce, M.N., “Syn-eruptive Redox Variations and Olivine-Melt Relationships in the 1959 Eruption of Kilauea Volcano as Revealed by XANES” *Journal of Volcanology and Geothermal Research*. 333, p. 1-14. 2017.
- <sup>‡</sup>Le Voyer, M., Kelley, K.A., **Cottrell, E.**, Hauri, E.H., “Heterogeneity in mantle carbon content from CO<sub>2</sub>-undersaturated basalts.” *Nature Communications*, 8, doi: 10.1038/ncomms14062. 2017.
- <sup>‡</sup>Davis, F.A., **Cottrell, E.**, <sup>†</sup>Birner, S.K., Warren, J.M., <sup>†</sup>Lopez, O.G., “Revisiting the electron microprobe method of spinel-olivine-orthopyroxene oxybarometry applied to spinel peridotites.” *American Mineralogist*, 102, 421–435. 2017. <https://doi.org/10.2138/am-2017-5823>
- <sup>†</sup>Ruth, D.C.S., **Cottrell, E.**, Cortes, J.A., Kelley, K.A., Calder, E.S. “Physical and chemical processes associated with passive degassing and the 2008 violent Strombolian eruption of Llama volcano, Chile.” *Journal of Petrology*, 57, 9, p. 1833-1864. Doi: 10.1093/petrology/egw063. 2016.
- <sup>†</sup>Brounce, M.N., Kelley, K.A., Stern, R., Martinez, F., and **Cottrell, E.**, “The Fina Nagu Volcanic Complex: Unusual submarine arc volcanism in the rapidly deforming southern Mariana margin,” *Geochemistry, Geophysics, Geosystems*, 17.10: 4078-4091. 2016.
- Zellmer, G.F., Pistone, M., Iizuka, Y., Andrews, B.J., Gomez-Tuena, A., Straub, S.M., and <sup>§</sup>**Cottrell, E.**, “Petrogenesis of antecryst-bearing arc basalts from the Trans-Mexican Volcanic Belt: insights into along-arc variations in magma-mush ponding depths, H<sub>2</sub>O contents, and surface heat flux.” *American Mineralogist*, 10.2138/am-2016-5701. 2016. 2021 Erratum DOI: <http://dx.doi.org/10.2138/am-2021-E10632>.
- <sup>†</sup>Birner, S.K., Warren, J.M., **Cottrell, E.**, and <sup>‡</sup>Davis, F.A. “Hydrothermal alteration of seafloor peridotites does not influence oxygen fugacity recorded by spinel oxybarometry.” *Geology*. 44.7. 535-538. 2016.
- <sup>†</sup>Grocke, S.B., **Cottrell, E.**, de Silva, S., and Kelley, K.A. “The role of crustal and eruptive processes versus source variations in controlling the oxidation state of iron in Central



- Andean magmas.” *Earth and Planetary Science Letters*, 440, 92-104. 2016.
- <sup>†</sup>Zhang, H.L., Hirschmann, M.M., **Cottrell, E.**, Newville, M., and Lanzirrotti, A. “Structural environment of iron and accurate determination of Fe<sup>3+</sup>/ΣFe ratios in andesitic glasses by XANES and Mossbauer spectroscopy.” *Chemical Geology*, 428, 48-58. 2016.
- <sup>‡</sup>McCormick, B., <sup>‡</sup>Popp, C., Andrews, B., & <sup>§</sup>**Cottrell, E.** “Ten years of satellite observations reveal highly variable sulphur dioxide emissions at Anatahan Volcano, Mariana Islands.” *Journal of Geophysical Research: Atmospheres*, 120(14), 7258-7282. 2015.
- <sup>†</sup>Brounce, M.N., Kelley, K.A., **Cottrell, E.**, Regan, M.K., “Temporal evolution of mantle wedge oxygen fugacity during subduction initiation,” *Geology*, v. 43, p 775-778, 2015. Doi:10.1130/G36742.1
- <sup>‡</sup>Le Voyer, M., **Cottrell, E.**, Kelley, K.A., <sup>†</sup>Brounce, M., and Hauri, E.H., “The effect of primary versus secondary processes on the volatile content of MORB glasses: an example from the equatorial Mid-Atlantic Ridge (5°N-3°S), *Journal of Geophysical Research, Solid Earth*. 120, p125-144, doi:[10.1002/2014JB011160](https://doi.org/10.1002/2014JB011160), 2015.
- Loughlin, S.C., Vye-Brown, C., Sparks, R.S.J., Brown, S.K., Barclay, J., Calder, E., **Cottrell, E.**, Jolly, G., Komorowski, J-C., Mandeville, C., Newhall, C., Palma, J., Potter, S., and Valentine, G. An introduction to global volcanic hazard and risk. In S.C. Loughlin et al. (Eds) *Global volcanic hazards and risk*, Cambridge University Press, Cambridge, p1-75, 2015.
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- Siebert L., **Cottrell E.**, Venzke E., and Andrews B. “Earth volcanoes and their eruptions: an overview.” In: Sigurdsson H, Houghton B, McNutt S, Rymer R, Stix J, (eds) *Encyclopedia of Volcanoes*, 2<sup>nd</sup> ed. Academic Press, p.1426. ISBN-13: 978-0123859389. 2015.
- <sup>†</sup>Brounce, M., Kelley, K.A., **Cottrell, E.** “Variations in Fe<sup>3+</sup>/ΣFe of Mariana Arc basalts and mantle wedge fO<sub>2</sub>,” *Journal of Petrology*, **55**, 2513-2536. Doi:10.1093/petrology/egu065. 2014.
- Cottrell E.**, “Chapter 1: The Global Distribution of Active Volcanoes,” in *Volcanic Hazard, Risk & Disaster*. P. Papale, volume editor. Hazards and Disasters Series. Elsevier. 2015.
- S.K. Brown, Crossweller, S., Sparks, S., **Cottrell, E.**, Deligne, N. I., Guerrero, N. O., Hobbs, L., Kiyosugi, K., Loughlin, M., Siebert, L., and Takrada, S., “Characterisation of the Quaternary eruption record: analysis of the Large Magnitude Explosive Volcanic Eruptions (LaMEVE) database” *Journal of Applied Volcanology* **3**, 5. 2014.
- <sup>‡</sup>Grocholski, B., Shim, S.H-. **Cottrell, E.** and Prakapenka, V.B., “Crystal Structure and Compressibility of Lead Dioxide up to 140 Gpa,” *American Mineralogist*, v. 99, 2014.
- <sup>†</sup>de Moor, J.M., Fischer, T.P., Sharp, Z.D., King, P.L., Wilke, M., Botcharnikov, R. E., **Cottrell, E.**, Zelenski, M., Marty, B., Klimm, K., Rivard, C., Ayalew, D., Ramirez, C., Sulfur degassing at Erta Ale (Ethiopia) and Masaya (Nicaragua): Implications for degassing processes and oxygen fugacities of basaltic systems. *Geochemistry, Geophysics, Geosystems* 14, doi:[10.1002/ggge.20255](https://doi.org/10.1002/ggge.20255). 2013.

- <sup>‡</sup>Seagle, C.T., **Cottrell E.**, Fei, Y., Hummer, D., and Prakapenka, V., “Electrical and Thermal Transport Properties of Iron and Iron-Silicon Alloy at High Pressure,” *Geophysical Research Letters*, doi: 10.1002/2013GL057930, 2013.
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## SELECTED ABSTRACTS & UNREFEREED PUBLICATIONS

(SPECIAL INDICATIONS: †*STUDENT*, ‡*POSTDOCTORAL ADVISEE* OR \**EMPLOYEE*)

- ‡M Holycross, **E Cottrell**, “The partitioning of iron species between garnet and melt in subduction zones.” Goldschmidt 2023 Conference
- ‡MJ Muth, **E Cottrell**, “No detectable redox exchange between sulfur and iron during cooling of basalts.” Goldschmidt 2023 Conference
- †SK Birner, **E Cottrell**, ‡FA Davis, JM Warren, “Refractory peridotites at ultraslow-spreading ridges record ultra-low oxygen fugacity.” Goldschmidt 2023 Conference
- ‡FA Davis, **E Cottrell**, “Experimental measurements of Fe<sub>2</sub>O<sub>3</sub> partitioning during partial melting of peridotite with implications for Fe<sub>2</sub>O<sub>3</sub> concentration in the MORB-source mantle.” Goldschmidt 2023 Conference
- E Cottrell**, †SK Birner, ‡FA Davis, JM Warren, D Canil, C Langmuir, “Records of Archean mantle oxygen fugacity,” Goldschmidt 2023 Conference
- JM Warren, C Prigent, †SK Birner, **E Cottrell**, ‡FA Davis, KJ Lynn, “Abyssal peridotite constraints on hydrothermal fluid circulation,” Goldschmidt 2023 Conference
- †AR Ajayi, ‡FA Davis, **E Cottrell**, “Spinel-melt Fe<sup>3+</sup> partition coefficient increases with spinel Cr#,” Goldschmidt 2023 Conference
- †LT Little, ‡FA Davis, **E Cottrell**, “High-pressure experiments investigating of Fe<sub>2</sub>O<sub>3</sub> partitioning between minerals and silicate melts in refractory peridotite.” Goldschmidt 2023 Conference
- ‡M Holycross, **E Cottrell**, “The partitioning of ferric and ferrous iron between garnet and melt in subduction zones.” AGU Fall Meeting Abstracts 2022, V45A-04
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- Cottrell, E.**, †S. Birner, †M. Brounce, F. A. ‡Davis, ‡L. E. Waters and K. A. Kelley. “Oxygen Fugacity Across Tectonic Settings.” International Goldschmidt Meeting, Honolulu, Hawaii. **INVITED**. 2022.
- ‡Holycross, M. and **Cottrell E.** 2022. “Vanadium partitioning during eclogite melting and arc cumulate fractionation in subduction zones.” International Goldschmidt Meeting, Honolulu, Hawaii. **INVITED**. 2022.
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- <sup>‡</sup>George L. Guice; Michael R. Ackerson; Benjamin J. Andrews; Catherine M. Corrigan; **Elizabeth Cottrell**; Gabriela A. Farfan; Leslie J. Hale; Briana L. Pobiner; <sup>‡</sup>Daniel J. Rasmussen; <sup>‡</sup>Camila Souto. “Advancing diversity, equity, accessibility, and inclusion at the Smithsonian’s National Museum of Natural History: unique opportunities and challenges.” GSA Fall Meeting. 2021
- <sup>‡</sup>Fischer R., **Cottrell E.**, Hauri E., Lee K. and <sup>‡</sup>Le Voyer M. 2021. “The origins of the mantle’s carbon and the bulk carbon content of the Earth.” International Goldschmidt Meeting, Lyon, France. **INVITED.**
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- <sup>‡</sup>Jackson, C.R.M., Bennett, N.N., Du, Z., **Cottrell, E.**, Fei, Y. 2018. “Early episodes of high-pressure core formation preserved in plume mantle.” Fall Meeting of the American Geophysical Union. **INVITED.**
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- <sup>#</sup>Waters, L.A., **Cottrell, E.**, Kelley, K.A., Coombs, M. “Calc-Alkaline Liquid Lines of Descent Produced Under Oxidizing Conditions: An Experimental and Petrologic Study of Basaltic Tephros from the Western Aleutians, AK.” Fall Meeting of the American Geophysical Union. V11B-0343. 2017.
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- <sup>†</sup>Birner, S., **Cottrell, E.**, Warren, J.M., K.A. Kelley, and <sup>‡</sup>Davis, F.A. “Records of upper mantle oxygen fugacity gleaned from high-density sampling of basalts and peridotites at ultraslow ridges.” Fall Meeting of the American Geophysical Union. 2016. **GeoPRISMS Best Student Oral Presentation Award.**
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- †*Said, M., †Birner, S.K., and Cottrell, E.,* “Oxygen fugacity of abyssal peridotites along the Gakkle Ridge,” Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p.767, paper number 302-5. 2015.
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- ‡Popp, C., Andrews, B., Carn, S.A., Chance, K., **Cottrell, E.**, Schwandner, F.M., “Analysis of GOSAT XCO<sub>2</sub> in explosive volcanic plumes,” EGU General Assembly Conference Abstracts 16, 14675, 2014
- ‡Davis, F.A., McDonough, W.F., **Cottrell, E.**, Ash, R.D., “Hawaiian peridotite xenoliths and the use of Ni in olivine as a petrogenetic indicator for basalt.” Goldschmidt Geochemical Conference, Sacramento, CA, USA. Abstract/Oral Presentation. **INVITED.** 2014
- ‡Davis, F.A. and **Cottrell, E.**, “Parameters affecting the depth of redox melting beneath ridges.” Goldschmidt Geochemical Conference, Sacramento, CA, USA. Abstract/Poster Presentation. 2014
- Helz, R., **Cottrell E.**, Kelley K.A., †Brounce M.N. “Redox history of the 1959 Kilauea eruption determined by XANES analysis of glassy scoria.” Goldschmidt Abstracts, 2014
- Cottrell, E.**, Lekic V., Davis F., and Kelley K.A., “Redox Controls on the Asthenosphere,” Fall Meeting of the American Geophysical Union, 2013. **INVITED**
- Kelley, K.A. and **Cottrell, E.** “Links between oxygen fugacity, slab fluids, and calc-alkaline differentiation of arc magmas,” Fall Meeting of the American Geophysical Union, 2013. **INVITED**
- ‡Le Voyer, M. Hauri, E.H., **Cottrell, E.** and Kelley, K.A. "Mantle heterogeneities revealed by along-axis variations in MORB volatile contents" Fall Meeting of the American Geophysical Union, 2013
- †Birner, S.K., Warren, J.M., **Cottrell E.**, Lopez, O.G., Davis, F.A., Falloon, T.J., “Variations in Oxygen Fugacity among Forearc Peridotites from the Tonga Trench.” Fall Meeting of the American Geophysical Union, 2013. **Honorable Mention, Outstanding Student Paper Award.**

- <sup>‡</sup>Popp, C., Andrews, B., Chance, K., **Cottrell, E.**, Buchwitz, M., Reuter, M., Schneising, O., and Burrows, J., "CO<sub>2</sub> release of the Kasatochi eruption in August 2008 as detected from space," Fall Meeting of the American Geophysical Union, 2013.
- <sup>‡</sup>McCormick, B.T., **Cottrell, E.**, Lopez, O.G., Mather, T.A., Pyle, D.M., and Venzke, E. "Towards improved volcanic emissions budgets: opportunities arising from a new global database of volcanic degassing data." Fall Meeting of the American Geophysical Union, 2013.
- <sup>‡</sup>Davis, F.A., **Cottrell, E.**, McDonough, W.F., Ash, R.D., "First-row transition elements (FRTE) in Hawaiian lherzolite xenoliths and their implications for lithologic heterogeneity in basalt source regions," Fall Meeting of the American Geophysical Union, 2013.
- <sup>†</sup>Brounce, M., Kelley, K.A., and **Cottrell, E.**, "Temporal evolution of oxygen fugacity in the Marianas mantle wedge." Fall Meeting of the American Geophysical Union, 2013
- <sup>†</sup>Grocke, S.B., de Silva, Shanaka, **Cottrell, E.**, Andrews, B.J., Lindsay, J.M., "Timescales and storage conditions for the Tara supervolcanic magma system; insights from geothermobarometry and quartz chemistry." Fall Meeting of the American Geophysical Union, 2013
- Cottrell, E.**, "Mantle redox heterogeneity," COMPRES Annual Meeting. Lake Geneva, WI., 2013. **KEYNOTE**
- Cottrell, E.**, and Kelley, K.A., "Estimating system oxygen fugacity using micro-XANES spectroscopy," Geological Society of American Annual Meeting, 2013. **INVITED**
- <sup>‡</sup>McCormick, B.T., **Cottrell, E.**, Fischer, T., Chiodini, G., and Cardellini, C. "Transformational science with a new global volcanic gas emissions database", *Mineralogical Magazine*, **77(5)** 1720.
- <sup>‡</sup>McCormick, B.T., Clor, L.E., **Cottrell, E.**, Fischer, T., Hauri, E., Lehnert, K., and \*Venzke, E. "A new global database of volcanic gas emissions", IAVCEI 2013 Scientific Assembly, 4A2\_4H-O12.
- <sup>‡</sup>Popp, C., Andrews, B. J., Chance, K., **Cottrell, E.**, Buchwitz, M., Reuter, M., and Schneising, O. "Detection of volcanic CO<sub>2</sub> in the August 2008 Kasatochi eruption plume by SCIAMACHY measurements", IAVCEI Scientific Assembly, 2013.
- <sup>†</sup>Grocke, S.B., **E. Cottrell**, S.L. de Silva, B.J. Andrews, and K.W. Kelley. Evaluating the role of crustal assimilation on the oxidation state of arc magmas. International Association of Volcanologists and Chemists of the Earth's Interior Meeting 2013, 1P1\_1C-O13.
- <sup>†</sup>Grocke, S.B., **Cottrell, E.**, de Silva, S.L., Andrews, B.J., Kelley, K.A. "The role of crustal assimilation on the oxidation state of arc magmas," Goldschmidt, 2013, Gold2013:abs2743. Oral Presentation.
- <sup>†</sup>Brounce M., Kelley, K.A., and **Cottrell, E.** "Evaluating proxies for fO<sub>2</sub> in the Marianas" Goldschmidt, 2013.
- <sup>‡</sup>Le Voyer, M., Rose-Koga, E., **Cottrell, E.** Kelley, K. and Hauri, E. "Fluorine and Chlorine as tracers of magma-fluid and magma-crust interactions" 2013, IAVCEI OP2\_1A-O14.
- <sup>‡</sup>Le Voyer, M., Hauri, E., **Cottrell, E.**, and Kelley, K. "Carbon inventory of oceanic basalts and the oceanic upper mantle" 2013, DCO International Science Meeting.

- Kelley, K.A., **Cottrell, E.** and <sup>†</sup>*Brounce, M.* “The relationship between  $fO_2$  and calc-alkaline affinity of arc magmas,” Goldschmidt, 2013.
- Cottrell E.** and Kelley K.A. “Redox Heterogeneity in MORB as a Function of Mantle Source.” Goldschmidt, 2013.
- Cottrell, E.,** \*Venzke, E., Siebert, L., and Andrews, B.J. Volcanoes of the World 4.0: The volcano and eruption database of Smithsonian’s GlobalVolcanism Program. International Association of Volcanologists and Chemists of the Earth’s Interior Meeting 2013, 4A2\_4H-O9.
- <sup>‡</sup>Grocholski, B. and **Cottrell, E.** “Water storage capacity of dense, lower mantle minerals.” 44<sup>th</sup> Lunar and Planetary Science Conference, 1303, 2013.
- <sup>‡</sup>Le Voyer, M., Hauri, E.H., Kelley, K.A., **Cottrell, E.** “Unraveling the effect of primary versus secondary processes on the volatile content of MORB glasses: an example from the equatorial Mid-Atlantic Ridge.” Fall Meeting of the American Geophysical Union, 2012.
- Cottrell E.** and Kelley K.A. “Redox Heterogeneity in MORB.” Fall Meeting of the American Geophysical Union, 2012. **INVITED.**
- <sup>†</sup>*Lopez, O.G., Cottrell E.,* and Warren, J., “Upper mantle oxygen fugacity in ridge and subduction zone settings recorded by spinel peridotite..” Fall Meeting of the American Geophysical Union, 2012.
- <sup>†</sup>*Brounce M.N.,* Kelley, K.A., and **Cottrell E.,** “ $Fe^{3+}/\Sigma Fe$  variation in Mariana arc and back-arc magmas and primary  $fO_2$  of the mantle wedge.” Fall Meeting of the American Geophysical Union, 2012. **Outstanding Student Paper Award.**
- Kelley, K.A., and Cottrell, E. “The oxidation state of Fe in subduction zone basalts and implications for mantle oxygen fugacity,” European Geophysical Union, 2012, EGU2012-877. **INVITED.**
- Kelley, K.A., and **Cottrell, E.,** “Importance of oxygen fugacity for temperatures and melting regimes beneath ridges, arcs, and hot spots.” Fall Meeting of the American Geophysical Union, 2011. **INVITED.**
- <sup>‡</sup>Seagle, C.T., **Cottrell, E.,** Fei, Y., Hummer, D., Prakenpenka V., “Electrical and Thermal Conductivity of Iron and Iron-Silicon Alloy at High Pressures.” Fall Meeting of the American Geophysical Union, 2011. **INVITED.**
- Cottrell, E.,** Andrews, B., Sorensen S.S., Hale, L.J., “Digital Management and Curation of the National Rock and Ore Collections at NMNH, Smithsonian.” Fall Meeting of the American Geophysical Union, 2011. **INVITED.**
- <sup>†</sup>*Brounce M.N.,* Kelley K, and **Cottrell E** “Effect of differentiation on Fe oxidation in arc basalts.” *Geochimica et Cosmochimica Acta Suppl.* Goldschmidt Conference Abstracts. 2011.
- <sup>†</sup>*Ruth, D. C. Sweeney,* Cortes, J.A., **Cottrell, E.,** Calder, E.S., Valentine, G.A., “Geochemical and textural comparison of two different scoria erupted from Llaima volcano, Chile.” Fall Meeting of the American Geophysical Union, 2010.
- <sup>†</sup>*Jackson, C.M., Cottrell E.,* and Kelley, K.A., “Mineral-melt partitioning of V and Sc at arcs: implications for mantle wedge oxygen fugacity.” Fall Meeting of the American Geophysical Union, V11F-01, 2010.
- Cottrell, E.,** Siebert, L., Kimberly, P. “The Future of Smithsonian’s Global Volcanism Program.” Fall Meeting of the American Geophysical Union, V43E-04, 2010. **INVITED.**

- Kelley, K.A. and **Cottrell, E.**, “Redox Conditions of Subduction Zone Magmas and Mantle,” Fall Meeting of the American Geophysical Union, V11F-03, 2010. **INVITED.**
- †*Brounce M.N.*, Kelley, K.A., and **Cottrell E.**, “Variations in Fe oxidation state at arc volcanoes driven by degassing and crystallization.” Fall Meeting of the American Geophysical Union, V43A-2333, 2010.
- ‡*Seagle, C. T.*, **Cottrell E.**, and Fei Y., “Equilibrium between solid and liquid iron: The Fe-Si-O system at high pressures,” Fall Meeting of the American Geophysical Union, 2010.
- ‡*Seagle, C. T.*, **Cottrell E.**, and Fei Y., “Experimental Investigation of the Fe-Si-O System at High Pressures,” International Mineralogical Association Meeting 2010
- ‡*Seagle, C. T.*, **Cottrell E.**, and Fei Y., “Experimental Investigation of the Fe-Si-O System at High Pressures,” COMPRES Annual Meeting 2010
- Cottrell E.** and Kelley K.A. “Basaltic glasses as records of mantle oxygen fugacity.” **KEYNOTE.** *Geochimica et Cosmochimica Acta Suppl.* Goldschmidt Conference Abstracts. 2010.
- Kelley K, **Cottrell E.**, †*Brounce M* & †*Parks B.*, “The Influence of Magmatic Differentiation on the Oxidation State of Fe in Arc Magmas.” **INVITED.** *Geochimica et Cosmochimica Acta Suppl.* Goldschmidt Conference Abstracts. 2010.
- Plank T, Zimmer M, **Cottrell E** & Kelley K., “The Oxidation State of Magmas from Melt Inclusions and Olivine Hosts.” *Geochimica et Cosmochimica Acta Suppl.* Goldschmidt Conference Abstracts. 2010.
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- Cottrell E.** and Walter M.J. “Monte Carlo Error Analysis Applied to Core Formation: The Single-stage Model Revived.” *EOS Trans.* V13C-2046. 2009
- †*Parks B.H.* Kelley K.A. **Cottrell E.**, †*Posner E.S.* “The Influence of Cooling History on the Redox Conditions of Subduction Zone Magmas.” *EOS Trans.* V11D-1982. 2009.
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- Cottrell, E.**, and Kelley K.A. “Detecting and Correcting Melt Inclusion Modification.” **INVITED.** *EOS Trans.* V13F-02. 2008.
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- ‡*Ricolleau, A.*, Y. Fei, **E. Cottrell**, H. Watson, L. Zhang, G. Fiquet, A. Auzende, M. Roskosz, G. Morard, and V. Prakapenka. 2008. New Constraints on the Pyrolitic Model Under Lower Mantle Conditions. *Geochimica Et Cosmochimica Acta* 72(12): A795-A795.

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- E. Cottrell**, Fei Y. Ricolleau A. Prakapenka V. “Nickel Partitioning Between Liquid Metal and Liquid Silicate in the LHDAC: Techniques for Achieving Reliable Partition Coefficients.” Proceedings of the 39th Annual LPSC. Abs no. 2267, 2008.
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- E. Cottrell** and D. Walker, “PtFe Nano and Micro-Nuggets in Experimental Silicate Glasses.” **INVITED**. EOS Trans. AGU, Fall Meet. Suppl., 2007. Abstract V22B-01.
- E. Cottrell**, K. Kelley, and R. Fischer, “New micro-XANES determinations of Fe speciation as a proxy for oxidation state of global MORB and arc magmas.” EOS Trans. AGU, Fall Meet. Suppl., 2007. Abstract DI43A-07.
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- †R. Fischer, **E. Cottrell**, A. Lanzirotti, and K. Kelley, “Micro-XANES determinations of Fe speciation in natural basalts at mantle-relevant  $fO_2$ .” EOS Trans. AGU, Fall Meet. Suppl., 2007. Abstract DI33A-1119.
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- J. Castro, P. Beck, **E. Cottrell**, and H. Tuffen, “Spherulites record crystallization, degassing, and oxidation-reduction mechanisms in obsidian flows.” **INVITED**. EOS Trans. AGU, Fall Meet. Suppl., 2007. Abstract V14A-07.
- A. Ricolleau, Y. Fei, **E. Cottrell**, H. Watson, L. Deng, L. Zhang, G. Fiquet, A. Auzende, M. Roskosz, G. Morard, V. Prakapenka, “New constraints on the pyrolitic model: in situ x-ray diffraction measurements on KLB-1 peridotite under the lower mantle conditions.” EOS Trans. AGU, Fall Meet. Suppl., 2007.
- Cottrell E.** Fei Y., Ricolleau A., Prakapenka V., “Experimental Petrology in the LHDAC.” COMPRES Annual Meeting, June 2007.
- ‡Ricolleau A., Fei Y., **Cottrell E.**, Corgne A., Wang Y., Roskoz M., and Prakapenka V, “In-Situ X-Ray Diffraction Measurements of Ferropicicase up to 110 GPa and 2000K.” EOS Trans. AGU, 87(52) Fall Meet. Suppl., 2006. Abstract MR11A-0103, 2006.
- Cottrell E.** and Fei Y., “Challenges to Determining Metal-Silicate Element Partition Coefficients Under Extreme P-T Conditions.” EOS Trans. AGU, 87(52) Fall Meet. Suppl., 2006. Abstract MR11A-0092
- Cottrell E.** and Walker D., “The effect of temperature and carbon on W partitioning between metal and silicate.” AGU Joint Assembly. V31A-05. 2006.
- Cottrell E.** and Walker D., “The origin of PtFenano- and micro-nuggets in experimental silicate glasses and its constraint on planetary core formation.” Nanoscale Processes in Earth and Planetary Sciences, NNIN Workshop. No. 1722. January, 2006.

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- Cottrell E.** and Walker D., “High Temperature Effects on Pt Partitioning Between Metal and Mafic Silicate Liquids: Implications for Core Formation.” EOS Transactions, AGU, MR21A-04, Fall Meeting 2005
- Cottrell E.** and Goldstein, S. “Glaciers in New York City: A Field Guide, Exercises & Instructor Manual.” [www.gl.ciw.edu/cottrell](http://www.gl.ciw.edu/cottrell), Columbia University, 2004.
- Cottrell E.**, Jaupart, C., and Molnar P., “Marginal Stability of Thick Continental Lithosphere.” EOS, Transactions, AGU, T31A-1264, Fall Meeting, 2004.
- Cottrell E.** and Walker D., “Ultra-High Temperature Effects in Earth’s Magma Ocean: Pt and W Partitioning.” Proceedings of the Oxygen in Terrestrial Planets Conference. 2004.
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- <sup>†</sup>*Levine NM*, “Trace Element Concentrations in Melt Inclusions within a Plagioclase Phenocryst Host,” Junior Paper, Geosciences Department Princeton University, 2001-2002
- Cottrell E.** and Walker D., “A New Look at Pt Solubility in Silicate Liquid.” Proceedings of the 33rd Annual Lunar and Planetary Science Conference. Abs no.1274. 2002.
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- Cottrell E.**, Rutherford M.J., Gardner J., “Conflicting Evidence for Pre-Eruptive Conditions and Processes in the Minoan Rhyodacite, Santorini, Greece.” EOS, Transactions, AGU, 77, 46, pp. F805, V22A-24 **INVITED**, 1996.

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**NATIONAL PUBLIC MEDIA AND ONLINE EDUCATIONAL PRODUCTS CREATED TO ADVANCE  
PUBLIC UNDERSTANDING OF SCIENCE**

- 2021      Featured Scientist on Audibles’ podcast “[A Grown-Up Guide to Planet Earth](#)” (with Professor Christopher Jackson).
- 2020      Host of NMNH’s 2020 “[The Dr. Is In!](#)” An accessible and fun 6-part social media (Twitter, IG, FB, YouTube) video series about geology, the deep earth, and the great outdoors.
- 2019      Featured Guest in Smithsonian American Art Museum's [Re:Frame](#), exploring American art’s many meanings and connections with experts. [Graphite Episode](#).
- 2017      “[Smithsonian Geologist Digs Up Clues to Earth’s Beginnings](#).” Washington Post’s Kid’s Post. March 13, 2017.  
Released “[Smithsonian’s Nature of Science: Expedition to Arctic Volcanoes](#),” a documentary short that chronicled the 2015 field expedition to the Western Aleutians. This video won a [Telly Award](#).

- 2016 Coverage of [Eruptions, Earthquakes, and Emissions](#) (E3) launch.  
 BBC News, “Volcano insight: Fifty years of eruptions revealed,” by V. Gill.  
<http://www.bbc.com/news/science-environment-37569152>  
 Washington Post. “Watch Earth pulse with earthquakes and eruptions in this stunning visualization,” by S. Kaplan. <https://www.washingtonpost.com/news/speaking-of-science/wp/2016/10/10/watch-earthpulse-with-earthquakes-and-eruptions-in-this-stunning-visualization/>  
 New York Times, Science Times, October 11, 2016. “What 50 Years of Earthquakes and Volcanic Eruptions Look Like,” by N. St. Fleur.  
[http://www.nytimes.com/2016/10/11/science/earthquakes-volcanos.html?\\_r=0](http://www.nytimes.com/2016/10/11/science/earthquakes-volcanos.html?_r=0)
- 2014 Featured guest on NPR’s nationally broadcast Science Friday, September 12, 2014:  
<https://www.sciencefriday.com/segments/keeping-an-eye-on-eruptions-around-the-world/>  
 Featured guest on Smithsonian’s ScienceHow Live Webcast  
<http://qrius.si.edu/watch/volcano-geochemistry-webcast-elizabeth-cottrell#.VBc73C5dVok>
- 2013 AAAS Podcast: Why mantle geochemistry matters: Elizabeth Cottrell connects mantle oxidation state to mid-ocean ridge basalts and the global carbon cycle.  
<https://tinyurl.com/mebbyyo> [sciencemag.org]  
 Deep Carbon Observatory News: <https://tinyurl.com/ny4a3nk> [deepcarbon.net]  
 Brookhaven News Room: <http://www.bnl.gov/newsroom/news.php?a=24076>
- 2011 Q&A on the Virginia Earthquake with Smithsonian Scientist Elizabeth Cottrell.  
<https://tinyurl.com/k9wtocm> [smithsonianmag.com]  
 “Volcanoes with Liz” four-part video series for public audiences and for classroom use.  
<https://tinyurl.com/kklqlgo> [itunes.apple.com]  
 “Vanished,” An online game for middle-school aged children created by MIT’s Education Arcade and the Smithsonian Institution. <https://vanished.mit.edu/user/register>  
 Videos produced for Vanished include:  
 “Understanding the Deep Earth” <http://www.youtube.com/watch?v=5x9FS4XdrwM>  
 “How to be a Scientist” <http://www.youtube.com/watch?v=ohf8-Mo8iyY>  
 “All We Saw Was a Pile of Goop” <http://www.youtube.com/watch?v=tyF2Ar7H4-4>  
 Understanding the Japan Earthquake. Smithsonian YouTube Channel.  
<http://www.youtube.com/watch?v=fraPBV4kzvI>
- 2010 Smithsonian geologist puts Eyjafjallajökull eruption in perspective. Smithsonian YouTube Channel. <http://www.youtube.com/watch?v=U8965YViiPo>  
 Recreating Volcanoes in a Lab. Smithsonian YouTube Channel.  
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 Urquhart J. "Water Linked to Mantle Oxidation" *Chemistry World Magazine*. <http://www.rsc.org/chemistryworld/News/2009/July/30070901.asp>
- 2004 Stoddard, J. "Simulating the Creation of the Earth's Core, With the Help of Great Gray." *Earth Institute News*. <https://tinyurl.com/m8vzdyn> [columbia.edu]
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**ACADEMIC COLLOQUIA AND MAJOR (> 100 ATTENDEES) PUBLIC LECTURES**

- 2022 Annual Five College Geology Lecture, Hosted by Smith College, MA, March
- 2021 Department of Geological Sciences, Jadavpur University, India, July  
 Department of Earth and Environmental Sciences, Dalhousie University, CA, January  
 Institute of Earth Sciences, Hebrew University of Jerusalem, Israel, January
- 2020 Smithsonian Associates Inside Science Evening Program, "Volcanoes of the Western Aleutians," Washington DC, February  
 Research School of Earth Sciences, Australian National University, Canberra, Australia, September  
 Carnegie Earth and Planets Lab, "The oxygen fugacity and ferric iron content of MORB-source mantle," Washington, DC, October
- 2019 L'Institute de Physique du Globe, Paris, France, May  
 Laboratoire des Magmas et Volcans, Université Blaise-Pascale Clermont-Ferrand Auvergne, France, July  
 Yale Gem and Mineral Symposium, October
- 2018 California Institute of Technology, Earth and Planetary Sciences Division Seminar, April  
 University of Tennessee, Department of Earth and Planetary Sciences, February  
 University of California Berkeley, Earth and Planetary Sciences, March  
 Berea College, Keynote Lecture, Berea Undergraduate Research Symposium, October
- 2017 Princeton University, Department of Geosciences Colloquium, February  
 Massachusetts Institute of Technology, EAPS COG3 Seminar, March  
 University of Maryland Geochemistry Seminar, April
- 2016 University of California at Davis, Earth and Planetary Sciences, January



- Vanderbilt University, Dept. of Earth and Environmental Science, March  
 Northeastern Illinois University, Dept. of Earth Science, March  
 Northeastern Illinois University, Presidential Lecture Series (Public), March  
 2015 Drexel University, Dept of Biodiversity, Earth and Environmental Science,  
 January  
 Florida State University, Dept of Earth, Ocean and Atmospheric Science,  
 February  
 Challenger IMAX Theater, Tallahassee, FL, February  
 University of Vermont, Department of Geology, February  
 2014 Community College of Baltimore County, Physical Sciences, November  
 Cooperative Institute for Dynamic Earth Research (CIDER) 2014 Summer  
 Program, Santa Barbara, CA, July, 2014  
 Oregon State University, Dept. of Geosciences, May  
 Lamont-Doherty Earth Observatory, Columbia University, April  
 Oxford University, Dept. of Earth Sciences, March  
 Bristol University, School of Earth Sciences, March  
 2013 Wellesley, Dept. of Geosciences, February  
 Lafayette College, Geology and Environmental Sciences, February  
 University of Minnesota, Dept. of Geology and Geophysics, April  
 COMPRES Annual Meeting, Lake Geneva, WI, June  
 Carnegie Institution of Washington, Department of Terrestrial Magnetism,  
 September  
 Johns Hopkins University, Earth and Planetary Sciences, September  
 Lamont-Doherty Earth Observatory, Columbia University, Department of Earth  
 and Environmental Sciences, Colloquium, October.  
 University of Chicago, Dept. of Geophysical Sciences, November  
 Smithsonian Institution, National Museum of the American Indian, “The Future is  
 Here,” Conference, June  
 Brookhaven National Laboratory, March  
 2012 Lamont-Doherty Earth Observatory, Columbia University, Department of Earth  
 and Environmental Sciences, Geochemistry Seminar, April.  
 Concord University, Dept. of Physical Sciences, November  
 Smithsonian Institution, Castle Lecture Series, January  
 Smithsonian Institution, National Museum of Natural History, October  
 Smithsonian Institution, National Air and Space Museum, NASA STARS,  
 February  
 2011 State University of New York at Buffalo, Dept. of Geology, March

2010 University of Michigan, Dept. of Geological Sciences, January  
 Rutgers University, Dept. of Earth and Planetary Sciences, Colloquium, February  
 University of Maryland, Dept. of Geological Sciences, March

2009 University of NY at Stony Brook, Dept. of Geosciences, November  
 American Museum of Natural History, New York, January

2008 The George Washington University, October

2007 University of Chicago, Dept. of Geophysical Sciences, June  
 University of Rhode Island, Graduate School of Oceanography, April

2006 University of Toronto, Department of Geology, November  
 SUNY Stony Brook, Department of Geosciences, September  
 University of Maryland, Department of Geological Sciences, May  
 Brown University, Department of Geological Sciences, March  
 Northwestern University, Department of Geological Sciences, February  
 Smithsonian, National Museum of Natural History, Mineral Sciences, February

2005 Geological Society of Washington, Public Lecture Series  
 Columbia University, Department of Earth and Planetary Sciences

2004 American Museum of Natural History  
 Brown University, Department of Geological Sciences  
 Carnegie Institution of Washington, Geophysical Laboratory  
 Bryn Mawr College, Department of Geology  
 North Shore, East Hampton, and New York, NY Branch Meetings of the AAUW

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### STUDENTS AND POSTDOCS ADVISED

Postdocs Advised at the Smithsonian | First position after departure from my lab (does not necessarily reflect present position held)

Michelle Muth (2021 to present) | Tenure track faculty, University of Washington (starting fall 2023)

Dan Rasmussen (2019 to present)

Jonathan Tucker (2020 to 2022) | Associate Program Officer, Division of Earth and Life Sciences, National Academies of Science, Engineering, and Medicine

Megan Holycross (2017 2020) | Tenure track faculty, Cornell University

Colin Jackson (2016 to 2018) | Tenure track faculty, Tulane University

Laura Waters (2017) | Tenure track faculty, Sonoma State University

Rebecca Fischer (2015 to 2017) | Tenure track faculty, Harvard University

Mattia Pistone (2014 to 2016) | Ambizione Fellow of the Swiss National Science Foundation

Fred Davis (2012 to 2015) | Tenure-track faculty, University of Minnesota, Duluth

Christoph Popp (2012 to 2015) | Staff Scientist, Federal Office of Meteorology and Climatology  
MeteoSwiss

Marion Le Voyer (2012 to 2015) | non-tenure track lecturer, University of Maryland

Brendan McCormick (2012 to 2014) | Research Associate, Cambridge University, UK

Brent Grocholski (2011 to 2014) | Editor at AAAS, Science Magazine

Christopher Seagle (2009 to 2011) | Staff Scientist, Sandia National Laboratory

#### Graduate Student Thesis Committees

Logan Little (2022 to present) – Masters Student, University of Minnesota, Duluth, advised collaboratively w/ F. Davis

Ekaterina Rojas Kolomiets (2020 to Present) – School of Earth, Ocean and Environment, Univ. of South Carolina.

Natalie Raia (2019) – Pre-doctoral Fellow at University of Minnesota Twin Cities

Janine Andrys (2017 to present) – URI/GSO, advised collaboratively w/ K. Kelley | Graduation expected 2022

Suzanne K. Birner (2013 to 2018) – Stanford University, advised collaboratively w/ J. Warren | Tenure-track faculty, Berea University.

Maryjo Brounce (2009 – 2014) – URI/GSO, advised collaboratively w/ K. Kelley | Postdoctoral Fellow, California Institute of Technology, CA.

Dawn C. Sweeney Ruth (2010 – 2014) – State U. of NY at Buffalo, committee member | Postdoctoral Fellow at Earth Observatory of Singapore

Stephanie Grocke (2012 – 2014) – Oregon State University, committee member | Fulbright Fellow, Iceland

#### Undergraduate Interns

Ayomide Ajayi (2022) – University of Maryland, MD

Ian Ocampo (2018) – Sonoma State University, CA

Rilla McKeegan (2018) – Amherst College, MA

Susana Hoyos (2017) – EAFIT, Columbia

Meena Said (2015) – Lockhead University, PA.

Kellie Wall (2014) – Washington State University, WA.

Oscar Lopez (2012, 2013) – Northwestern University, IL.

Christa Jackson (2010 – 2011) – Humbolt State, CA.

Esther Posner (2009) – Grand Valley State University, MI.

Elizabeth Ruebush (2009) – Williams College, MA.

Rebecca Fischer (2007) – Northwestern University, IL.