

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

- 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'Institut du Physique du Globe, University of Paris VII*
Marginal Stability of Layered Miscible Fluids, Advisor: Claude Jaupart

HONORS, AWARDS, & FELLOWSHIPS

2016	Elected 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.

SELECTED EXTERNAL PROFESSIONAL SERVICE – LAST 10 YEARS

2021	President, Geological Society of Washington (elected position)
2021	Steering Committee for the Management and Operations of synchrotron-hosted analytical capabilities for Earth sciences research
2021	Theme Chair for the 2021 Goldschmidt Conference (Lyon, France)
2019-2021	Board Member representing North America, Geochemical Society (elected position)
2019-present	Steering Committee Member, NSF Research Collaboration Network “CONVERSE”
2010-present	Director, NSF-REU Site: Natural History Research Experiences, EAR-1062692, OCE-1560088
2018-present	AGU VGP Section Bowen Awards Committee
2016-present	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, 2013 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

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.)

PROFESSIONAL SOCIETIES

Geochemical Society (Chair of the Program Committee 2012-2013; Board Member Representing North America, elected 2019) ▪ American Geophysical Union (Bowen Award Committee Member) ▪ 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, elected 2016; MSA Award Committee Member)

REFEREED JOURNAL ARTICLES

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

- ‡Davis, F.A. and **Cottrell, E.**, “Partitioning of Fe₂O₃ in peridotite partial melting experiments 1 over a range of oxygen fugacities elucidates ferric iron systematics in mid-ocean ridge basalts and ferric iron content of the upper mantle. *Earth and Planetary Science Letters*. (under review)
- †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*. (under review)
- †Brounce, M., Reagan, M.K., Kelley, K.A., **Cottrell, E.**, Shimizu, K., Almeev, R.” and “Co-variation of slab tracers, volatiles and oxidation during subduction initiation.” (in revision for *G-cubed*)
- Cottrell, E.**, †S. Birner, †M. Brounce, F. A. ‡Davis, ‡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/essoar.10502445.1>, 2020 (in press, but available online at Earth and Space Science Open Archive (ESSOAr))
- Cottrell, E.**, †S. Birner, †M. Brounce, F. A. ‡Davis, ‡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.
- Rose-Koga EF, Bouvier A-S, Gaetani GA, Wallace PJ, Allison CM, †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, ‡Muth M, Myers ML, Narvaez DF, Navon O, Newcombe ME, Nichols ARL, Nielsen RL, Pamukcu A, Plank T, ‡Rasmussen DJ, Roberge J, Schiavi F, Schwartz DM, Shimizu Kei, Shimizu K, Shimizu N, Thomas JB, Thompson GT, ‡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*. In Press.
- ‡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* 104, <https://doi.org/10.1093/petrology/egaa104> 2020.
- ‡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> 2020.
- ‡Fischer, R.A., **Cottrell, E.**, Hauri, E., Lee, K.K., and ‡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.
- ‡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.

- [†]Brounce, M., **Cottrell, E.**, and Kelley, K.A. “The redox budget of the Mariana subduction zone.” *Earth and Planetary Science Letters*, 528, 115859. 2019.
- [‡]Le Voyer, M., Hauri, E.H., **Cottrell, E.**, Kelley, K.A., Salters, V.J., Langmuir, C.H., Hilton, D.R., Barry, P.H., and Füre, E. Carbon Fluxes and Primary Magma CO₂ 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., [‡]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.**, Lanzirotti, A., Mysen, B., [†]*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.
- [‡]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.
- [‡]Davis, F.A. and **Cottrell E.**, “Experimental investigation of basalt and peridotite oxybarometers: implications for spinel thermodynamic models and Fe³⁺ compatibility during generation of upper mantle melts.” *American Mineralogist* **103**: p. 1056-1067. 2018.
- [†]Zhang, H.L., **Cottrell, E.**, Kelley, K.A., and Hirschmann, M.M., “Determination of Fe³⁺/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.
- [†]*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*_{o2} despite local redox heterogeneity.” *Earth and Planetary Science Letters*. 494: p. 172-189. 2018.
- [†]*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.
- [†]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.

- [‡]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.
- [†]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.
- [†]Zhang, H.L., Hirschmann, M.M., **Cottrell, E.**, Withers, A.C. “Effect of pressure on Fe³⁺/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 [†]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.
- [‡]Le Voyer, M., Kelley, K.A., **Cottrell, E.**, Hauri, E.H., “Heterogeneity in mantle carbon content from CO₂-undersaturated basalts.” *Nature Communications*, 8, doi: 10.1038/ncomms14062. 2017.
- [‡]Davis, F.A., **Cottrell, E.**, [†]Birner, S.K., Warren, J.M., [†]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>
- [†]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 Llaima volcano, Chile.” *Journal of Petrology*, 57, 9, p. 1833-1864. Doi: 10.1093/petrology/egw063. 2016.
- [†]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 [§]**Cottrell, E.**, “Petrogenesis of antecryst-bearing arc basalts from the Trans-Mexican Volcanic Belt: insights into along-arc variations in magma-mush ponding depths, H₂O contents, and surface heat flux.” *American Mineralogist*, 10.2138/am-2016-5701. 2016.
- [†]Birner, S.K., Warren, J.M., **Cottrell, E.**, and [‡]Davis, F.A. “Hydrothermal alteration of seafloor peridotites does not influence oxygen fugacity recorded by spinel oxybarometry.” *Geology*. 44.7. 535-538. 2016.
- [†]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.
- [†]Zhang, H.L., Hirschmann, M.M., **Cottrell, E.**, Newville, M., and Lanzirotti, A. “Structural environment of iron and accurate determination of Fe³⁺/ΣFe ratios in andesitic glasses by XANES and Mossbauer spectroscopy.” *Chemical Geology*, 428, 48-58. 2016.
- [‡]McCormick, B., [‡]Popp, C., Andrews, B., & [§]**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.
- [†]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
- [‡]Le Voyer, M., **Cottrell, E.**, Kelley, K.A., [†]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.
- Brown, S.K., Loughlin, S.C., Sparks, R.S.J., Vye-Brown, C., Barclay, J., Calder, E., **Cottrell, E.**, Jolly, G., Komorowski, J-C., Mandeville, C., Newhall, C., Palma, J., Potter, S., and Valentine, G. Global volcanic hazard and risk. In S.C. Loughlin et al. (Eds) *Global volcanic hazards and risk*, Cambridge University Press, Cambridge. P76 – 167, 2015
- 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*, 2nd ed. Academic Press, p.1426. ISBN-13: 978-0123859389. 2015.
- [†]Brounce, M., Kelley, K.A., **Cottrell, E.** “Variations in Fe³⁺/ΣFe of Mariana Arc basalts and mantle wedge fO₂,” *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.
- [‡]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.
- [†]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.
- [‡]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.
- Cottrell E.**, Kelley K.A. “Redox Heterogeneity in Mid-Ocean Ridge Basalts as a Function of Mantle Source.” *Science*, **340**, pp. 1314-1317. Doi: 10.1126/science.1233299. 2013.
- Walter, M.J. and **Cottrell, E.** “Assessing uncertainty in geochemical models for core formation in Earth.” *Earth and Planetary Science Letters*, **365**, pp 165-176, 2013.
- Crossweller, S., Arora, B., S.K. Brown, **Cottrell, E.**, Deligne, N. I., Guerrero, N. O., Hobbs, L., Kiyosugi, K., Loughlin, S. C., Lowndes, J., Nayembil., M., Siebert, L., Sparks, S., Takrada, S., and *Venzke, E. “Global database on large magnitude explosive volcanic eruptions (LaMEVE).” *Journal of Applied Volcanology* **1**, 4. 2012.
- Kelley K.A. and **Cottrell E.** “The influence of magmatic differentiation on the oxidation state of Fe in a basaltic arc magma.” *Earth and Planetary Science Letters*, **329-330**, p.109-121, 2012. 10.1016/j.epsl.2012.02.010
- Cottrell E.**, Kelley K.A. “The oxidation state of Fe in MORB glasses and the oxygen fugacity of the upper mantle.” *Earth and Planetary Science Letters* **305**, pp 270-282, 2011.
- [‡]Ricolleau, A; Fei, YW; **Cottrell, E.**; Watson, H; Deng, LW; Zhang, L; Fiquet, G; Auzende, AL; Roskosz, M; Morard, G; Prakapenka, V,”Density profile of pyrolite under the lower mantle conditions”, *Geophysical Research Letters*, vol. 36, 10.1029/2008GL03675, 2009.
- Castro, J.M., **Cottrell, E.**, Tuffen, H., Logan, A., and Kelley, K.A. “Spherulite crystallization buffers Fe-oxidation in silicic melt,” *Chemical Geology* **268**, 272–280, 2009.

- Cottrell E.**, Kelley K.A., Lanzirotti A., Fischer R.A. “High-Precision Determination of Iron Oxidation State in Silicate Glasses Using XANES.” *Chemical Geology* 268, 167–179, 2009.
- Kelley, K.A. and **Cottrell E.**, “Water and the Oxidation State of Subduction Zone Magmas.” *Science*, vol 325 no 5940, pp. 605-607, 2009
- Cottrell E.** Walter, M.J., and Walker D., “Metal-silicate partitioning of tungsten at high pressure and temperature: implications for equilibrium core formation in Earth.” *Earth and Planetary Science Letters*. 281 (3-4), pp 275-287, 2009
- N. Chabot, A.J. Campbell, W.F. McDonough, D.S. Draper, C.B. Agee, M. Humayun, H.C. Watson, **E. Cottrell**, and S. Saslow. “The Fe-C system at Pressure and Implications for the Earth’s Core,” *Geochimica et Cosmochimica Acta*, 72, p. 4146-4158. DOI: 10.1016/j.gca.2008.06.006, 2008
- Jaupart C., Molnar P., and **Cottrell E.** “Instability of a chemically dense layer heated from below and overlain by a deep less viscous fluid,” *Journal of Fluid Mechanics*, Volume 572, Issue -1, Feb 2007, pp 433-469
- Cottrell E.** and Walker D., “Constraints on Core Formation from Pt partitioning in Mafic Silicate Liquids at High Temperatures.” *Geochimica et Cosmochimica Acta*, 70 (6), p. 1565-1580. 2006.
- Cottrell E.**, Jaupart, C., and Molnar P., “Marginal stability of thick continental lithosphere.” *Geophys. Res. Lett.*, 31, L18612, doi:10/1029/3004GL020332, 2004.
- Cottrell E.**, Spiegelman M., Langmuir CH., “Consequences of diffusive reequilibration for the interpretation of melt inclusions.” *Geochem Geophys Geosy* 3: art. No. 1026 May 3 2002.
- Cottrell E.**, Gardner J., and Rutherford M.J., “Petrologic and experimental evidence for the movement and heating of the pre-eruptive Minoan rhyodacite (Santorini, Greece).” *Contrib. Min. Petrol.* 135; 4, p.315-337. 1999

SELECTED ABSTRACTS & UNREFEREED PUBLICATIONS

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

- Cottrell E.**, ‡Holycross, M.E., and Langmuir, C.H (2020) “Are Slab Contributions to the Mantle Wedge Oxidized?” International Goldschmidt Meeting, Honolulu, HI. **KEYNOTE.**
- Cottrell, E.**, ‡Waters, L.A., Coombs, M., Kelley, K.A., and Andrys, J. (2020) “Calc-Alkaline Magmas Trends at Crustal Pressure and High fO₂.” International Goldschmidt Meeting, Honolulu, HI. **INVITED.**
- †Jackson, C. and **Cottrell, E.** (2020) Non-Henrian Partitioning of Nitrogen in Slab Environments. International Goldschmidt Meeting, Honolulu, HI.
- †Davis, F.A. and **Cottrell, E.** (2020) “Partitioning of Fe³⁺ During Peridotite Partial Melting at 1 Bar and 1.5 GPa.” International Goldschmidt Meeting, Honolulu, HI.
- †Birner, S.K., **Cottrell, E.**, ‡Davis, F.A., Warren, J.M., Kelley, K.A., and †Said, M. (2019) Thermodynamic and Geochemical Heterogeneity within Mid-Ocean Ridge Peridotites. Fall Meeting of AGU. V23B-03.
- †Brounce, M., Reagan, M.K., Coulthard, D.A., Kelley, K.A., and **Cottrell, E.** (2019) The Oxidation States of Iron and Volatile Compositions of Expedition 352 Glasses.” GSA Annual Meeting in Phoenix, Arizona, USA-2019. GSA. **INVITED.**
- †Brounce, M.N., Kelley, K.A., **Cottrell, E.**, and Reagan, M.K. (2019) Enrichment in H₂O and elevated Fe oxidation states are linked to material recycling in Izu-Bonin-Marianas lavas. Fall Meeting of AGU. **INVITED.**
- Cottrell, E.**, Kelley, K.A., Tucker, J., Shimizu, K., Hauri, E., ‡Le Voyer, M., and Saal, A.E. (2019) Carbon in the Convecting Mantle. Fall Meeting of AGU. V24C-04.
- †Davis, F.A., and **Cottrell, E.** (2019) Partial melting of peridotite at 1 atm. and 1.5 GPa and varying oxygen fugacities. Fall Meeting of AGU. V31F-0190.
- †Jackson, C., Andrews, B.J., and **Cottrell, E.** (2019) Experimental investigations of nitrogen transiting the subduction barrier. Fall Meeting of AGU. V53C-06. **INVITED.**
- Kelley, K.A., **Cottrell, E.**, and ‡Le Voyer, M. (2019) Water Content of MORBs and the Oceanic Upper Mantle. Fall Meeting of AGU. V51I-0163.
- Lopez, T.M., Fischer, T.P., Plank, T.A., Malinverno, A., Rizzo, A.L., Rasmussen, D.J., **Cottrell, E.**, Werner, C.A., Kern, C., and Ilanko, T. (2019) Along-arc variations in volatile cycling across the Aleutian Arc. Fall Meeting of AGU. V53C-05. **INVITED.**
- †Lynn, K.J., Warren, J.M., **Cottrell, E.**, †Birner, S.K., Kelley, K.A., and Langmuir, C.H. (2019) Gakkel Ridge basalts and peridotites record along-strike variations in fO₂. Fall Meeting of AGU. V14C-01.
- Zhang, H., Hirschmann, M.M., Walter, M.J., Lord, O.T., **Cottrell, E.**, Tracy, S.J., and Rudra, A. (2019) Pressure effect on the oxidation state of a terrestrial magma ocean, from experimental perspective. AGU Fall Meeting.
- †Holycross, M. and **Cottrell E.** 2019. “A Vanadium-Based Redox Proxy for Eclogites.” International Goldschmidt Meeting, Barcelona, Spain.
- †Andrys J., Kelley K., **Cottrell E.**, Jackson M., and Coombs M. 2019. “Thermal Implications of Pb Isotope and Volatile Systematics in the Western Aleutian Arc.” International Goldschmidt Meeting, Barcelona, Spain.

- [‡]Fischer R., **Cottrell E.**, Hauri E., Lee K. and [‡]Le Voyer M. 2019. “The Carbon Content of Earth's Core from Metal-Silicate Partitioning Experiments.” International Goldschmidt Meeting, Barcelona, Spain.
- Cottrell E.**, Kelley K, Tucker J, Shimizu K, [‡]Le Voyer M, Saal A & Hauri E. 2019. “Carbon in the Convecting Mantle: Erik Hauri’s Legacy.” International Goldschmidt Meeting, Barcelona, Spain.
- [†]Brounce M., Reagan M., Coulthard D., Kelley K. and **Cottrell E.** 2019. “The Oxidation States of Iron and Volatile Compositions of Expedition 352 Glasses.” International Goldschmidt Meeting, Barcelona, Spain. **INVITED.**
- Cottrell, E.**, Kelley, K.A., Tucker, J.M., Shimizu, K., [‡]Le Voyer, M., Saal A., and Hauri, E.H. 2019. “Carbon in the Convecting Mantle,” *Interdisciplinary Earth Data Alliance*.
- [‡]Holycross, M. and **Cottrell, E.** (2018). “Rutile controls on vanadium during eclogite partial melting.” Fall Meeting of the American Geophysical Union.
- [‡]Fischer, R.A., **Cottrell, E.**, Lee, K.M.M., and Hauri, E. 2018. “Metal-silicate Partitioning of Carbon to 59 GPa and >5000 K with Implications for Earth’s Core Formation.” Fall Meeting of the American Geophysical Union. **INVITED.**
- [‡]Davis, F.A. and **Cottrell, E.** 2018. Oxygen fugacity and Fe³⁺ partitioning during partial melting of peridotite.” Fall Meeting of the American Geophysical Union.
- [‡]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.**
- [†]Andrys, J.A., Kelley, K.A., **Cottrell, E.**, Coombs, M.E., 2018. “Volatile contents of western Aleutian magmas and their relationship to slab thermal structure.” Fall Meeting of the American Geophysical Union.
- [†]Hoyos, S., Weber, M., **Cottrell, E.**, Duque, J., Cárdenas-Rozo, A., Beltrán-Triviño A., 2018. “Late Miocene garnet-bearing andesites in the Northern Andean Block and their tectonic implications.” Fall Meeting of the American Geophysical Union.
- Lopez, T., Fischer, T., Plank, T., Malinverno, A., Rizzo, A.L., Rasmussen, D.J., **Cottrell, E.**, Werner, C., Kern., C, Ilanko, T., Buff, L., Andrys, J.L., Kelley, K.A., 2018. “Tracing volatile cycling from subduction to outgassing along the Aleutian Arc.” Fall Meeting of the American Geophysical Union.
- [‡]Lynn., K.J., **Cottrell., E.**, Warren, J.M., Kelley, K.A., Langmuir., C.H. 2018. “An Oxidized Signature for the Gakkel Ridge ‘Dupal-like’ Isotopic Composition.” Fall Meeting of the American Geophysical Union.
- [†]Ocampo, I.K., Jackson, C.M., **Cottrell, E.**, 2018. “Nitrogen Solubility in Magma Oceans.” V11G-0093. Fall Meeting of the American Geophysical Union.
- Cottrell, E.** and Hale, L., 2018. “Smithsonian’s National Rock and Ore Collections: An International Legacy and Community Resource.” U43A-02. Fall Meeting of the American Geophysical Union. **INVITED.**
- Andrews, B., Venzke, E., **Cottrell, E.**, Sennert, K. 2018. “Interactive presentation of global volcanology and tectonic data sets for diverse audiences.” PA41B-18. Fall Meeting of the American Geophysical Union. **INVITED.**
- 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., Venzke, E., Williamson, J. 2018. “Characterising magmatic domains from a synthesis of global satellite radar measurements.” G21B-0547. Fall Meeting of the American Geophysical Union.

- [†]McKeegan, R., Holycross, M., **Cottrell, E.**, 2018. “Probing the Earth’s Deep Oxygen Cycle with Vanadium: The Temperature Dependence of Partitioning.” GSA Annual Meeting in Indianapolis, Indiana, USA.
- Cottrell, E.** and Kelley, K.A., “An fO_2 discontinuity across the Australian-Antarctic Discordance.” International Goldschmidt Conference, Boston, M.A., USA. **INVITED.**
- Kelley, K.A., **Cottrell, E.**, [†]Gentes, Z., and Arculus, R. “Highly oxidized, near-primary arc magmas influenced by slab melting.” International Goldschmidt Conference, Boston, M.A., USA. **INVITED.**
- [‡]Holycross, M. and **Cottrell, E.**, “A new oxybarometer for rutile.” International Goldschmidt Conference, Boston, M.A., USA.
- [‡]Jackson, C.M. and **Cottrell, E.**, Andrews B., Mikhail S., and Mare E. “Nitrogen and potassium transiting the redox and subduction barrier.” International Goldschmidt Conference, Boston, M.A., USA.
- Warren, J. [†]Birner, S, Cottrell, E., Katz R., Kelley, K., and [‡]Davis, F. “Source versus process: Peridotite constraints on magma genesis.” International Goldschmidt Conference, Boston, M.A., USA. **KEYNOTE.** 2018.
- [‡]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 Tephra from the Western Aleutians, AK.” Fall Meeting of the American Geophysical Union. V11B-0343. 2017.
- [†]Birner, S., [‡]Davis, F.A., **Cottrell E.**, Warren, J.M., K.A. Kelley, and “Subsolidus cooling of mid-ocean ridge peridotites and implications for the oxygen fugacity of the oceanic upper mantle.” Fall Meeting of the American Geophysical Union. V33D-0554. 2017.
- [‡]Jackson, C.R.M., Du, Z., Bennett, N., Fei, Y., **Cottrell, E.**, “Sequestration of Nitrogen in the Core During Accretion.” Fall Meeting of the American Geophysical Union. V31E-02. 2017.
- [‡]Davis, F.A., Wall, K., **Cottrell, E.** “Upper mantle oxygen fugacity recorded by peridotite xenoliths from oceanic islands.” Fall Meeting of the American Geophysical Union. V24C-06. 2017.
- Lopez, T. et al. “New constraints on subduction inputs and volatile outputs along the Aleutian Arc.” Fall Meeting of the American Geophysical Union. T231-03. 2017.
- [‡]Davis, F.A. and **Cottrell, E.** “Basalt glass Fe-XANES and spinel peridotite oxybarometers agree.” International Goldschmidt Geochemical Conference, Paris, France. 2017.
- Cottrell, E.**, Kelley, K.A., [†]Grant, E.R., Coombs, M., and [‡]Pistone, M. “Generation of calc-alkaline volcanics in the Western Aleutians.” Fall Meeting of the American Geophysical Union. 2016. **INVITED.**
- [†]Birner, S., **Cottrell, E.**, Warren, J.M., K.A. Kelley, and [‡]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.**
- [‡]Pistone, M., Whittington, A., Andrews, B., and **Cottrell, E.**, “Crystal-rich Lava Dome Extrusion During Vesiculation: An Experimental Study.” Fall Meeting of the American Geophysical Union. 2016.
- [‡]Fischer, R.A., Nimmo, F., **Cottrell, E.**, and O’Brian, P., “Effects of core formation on the Hf-W system.” Fall Meeting of the American Geophysical Union. 2016.
- Kelley, K.A. and **Cottrell E.**, “Scales of Redox Heterogeneity in MORBs and the upper mantle.” Fall Meeting of the American Geophysical Union. 2016.
- Moore, G., Touran, J., Pu, X., Kelley, K.A., and **Cottrell E.**, and Ghiorso, M., “Measurements of the Activity of dissolved H₂O in an Andesite Melt.” Fall Meeting of the American Geophysical Union. 2016.
- Cottrell, E.**, Kelley, K.A., [‡]Pistone, M., Coombs, M., and [†]Grant, E.R., “The role of volatiles in generating continental crust.” International Goldschmidt Conference. 2016. **KEYNOTE.**

- Moore, G., Touran, J., Pu, X., Ghiorso, M., and **Cottrell E.**, “Determining the activity of H₂O in silicate melts at H₂O-undersaturated conditions.” International Goldschmidt Conference. 2016.
- Kelley, K.A., **Cottrell, E.**, Coombs, M., and [†]Grant, E.R., “Water, fO₂, and the creation of continental crust signatures in Aleutian arc magmas.” International Goldschmidt Conference. 2016.
- Cottrell, E.**, Lanzirotti, A., Kelley, K.A., Newville, M., [†]Birner, S., Davis, F.A., Mysen, B., Botcharnikov, R. “Radiation-induced oxidation of Fe in hydrous basalt glasses.” International Goldschmidt Conference. 2016.
- [†]Birner, S., **Cottrell, E.**, Warren, J.M., K.A. Kelley, and [‡]Davis, F.A. “Oxygen fugacity of the oceanic upper mantle as recorded by peridotites from the Southwest Indian Ridge.” International Goldschmidt Conference. 2016.
- [†]Birner, S., Warren, J.M., **Cottrell, E.**, and Davis, F.A. “Heterogeneous Oxidation in Supra-Subduction Settings: Evidence from Forearc Peridotites.” Fall Meeting of the American Geophysical Union, V11D-3086. 2015. **INVITED.**
- [†]Peterson, M., Kelley, K.A., **Cottrell, E.**, Saal, A., and Kurz, M. 2015. “The Oxidation State of Fe in Glasses from the Galapagos Archipelago: Variable Oxygen Fugacity as a Function of Mantle Source.” Fall Meeting of the American Geophysical Union, V22E-03. 2015.
- Hirschmann, M., [†]Zhang, H., **Cottrell, E.**, “Revised Mossbauer Calibration for Fe³⁺/Fe^T of XANES Basalt Standards: Implications for MORB” Fall Meeting of the American Geophysical Union, V31D-3049. 2015.
- [†]Said, M., [†]Birner, S.K., and **Cottrell, E.**, “Oxygen fugacity of abyssal peridotites along the Gakkle Ridge,” Fall Meeting of the American Geophysical Union, V21A-3006. 2015.
- [†]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.
- [†]Brounce, M., Kelley, K.A., **Cottrell, E.**, Eiler, J., and Stolper, E. “Evidence for a role of slab fluids in the oxidized nature of arc basalts,” *Goldschmidt Abstracts*, p. 401. 2015.
- [‡]McCormick, B., [‡]Popp, C., Andrews, B., **Cottrell, E.** "A new SO₂ emissions budget for Anatahan volcano (Mariana Islands) based on ten years of satellite observations," EGU General Assembly Conference Abstracts 17, 6339. 2014.
- [‡]Popp, C., [‡]McCormick, B., Suleiman, R., Chance, K., Andrews, B., **Cottrell, E.** 2014. "Analysis of volcanic bromine monoxide emissions in the southwestern Pacific region in 2005 based on satellite observations from OMI," EGU General Assembly Conference Abstracts 17, 9837
- Cottrell, E.**, Lekic, V., Davis, F., and Kelley, K.A. 2014. “Insights Into Geodynamics from Mantle Redox,” Cooperative Institute for Deep Earth Research (CIDER) Annual Workshop. **KEYNOTE.**
- Cottrell, E.**, and Kelley, K.A. 2014. “Redox Heterogeneity of the Mantle Inferred from Hotspots,” Fall Meeting of the American Geophysical Union, V23B-02.
- [†]Wall, K., Davis, F.A., **Cottrell, E.** 2014. “Oxygen fugacity recorded by xenoliths from Pacific oceanic islands.” Fall Meeting of the American Geophysical Union, V52B-04. **Outstanding Student Paper Award.**
- Kelley, K.A. and **Cottrell, E.** 2014. “Roles of magmatic oxygen fugacity and water content in generating signatures of continental crust in the Alaska-Aleutian arc.” Fall Meeting of the American Geophysical Union, T11A-4531.
- [†]Gentes, Z., Kelley, K.A., **Cottrell, E.** and Arculus, R. 2014. Near-Primary Oxidized Basalts from the Submarine Vanuatu Arc. Fall Meeting of the American Geophysical Union, V33B-4864.
- [†]Birner, S.K., Warren, J.M., **Cottrell, E.**, and Davis, F. 2014. “Untangling the History of Oceanic Peridotites Using Spinel Oxybarometry. Fall Meeting of the American Geophysical Union, V53B-4863.

- [†]Grocke, S.B., de Silva, S.L., Wallace, P., Kent, A.J.R., Hervig, R.L., Andrews, B.J., Cottrell, E. 2014. "Storage Conditions of Large Silicic Magmatic Systems: Gauging Melt Evolution from Melt Inclusions Hosted in Different Phenocryst Phases." Fall Meeting of the American Geophysical Union, V51A-4721.
- [‡]Davis, F.A., **Cottrell, E.** 2014. "Oxygen fugacity profile of the oceanic upper mantle and the depth of redox melting beneath ridges." Fall Meeting of the American Geophysical Union, V51E-02. **INVITED.**
- [‡]Le Voyer, M. Kelley K.A., **Cottrell, E.**, and Hauri, E.H. 2014. "Undegassed carbon content from a highly depleted segment of the Mid-Atlantic Ridge (1-5°S): evidence from melt inclusions." Fall Meeting of the American Geophysical Union, V11C-4729. **INVITED.**
- [†]Brounce, M.N., **Cottrell, E.**, and Kelley, K.A. 2014. "The redox budget of the Mariana subduction zone." Fall Meeting of the American Geophysical Union, V31G-06.
- [†]Wall, K., [‡]Davis, F.A., and **Cottrell, E.**, "Oxygen fugacity recorded by xenoliths from Pacific ocean islands," Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.323, paper number 128-3, 2014
- Cottrell, E.**, [‡]Davis, F., [†]Birner, S.K., Warren, J.M., and [†]Wall, K., "Oxybarometry of peridotites from various tectonic settings," Geological Society of America *Abstracts with Programs*. Vol. 46, No. 6, p.414, paper number 164-7, 2014.
- [†]Birner, S.K., Warren, J.M., **Cottrell, E.**, Lopez, O.G., Davis, F.A., Falloon, T.J., "Oxygen Fugacity Variations Among Tonga Trench Forearc Peridotites," Goldschmidt Geochemical Conference, Sacramento, CA, USA. Abstract/Oral Presentation. 2014
- [‡]Popp, C., Andrews, B., Carn, S.A., Chance, K., **Cottrell, E.**, Schwandner, F.M., "Analysis of GOSAT XCO₂ 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 XANE 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.**
- [‡]Popp, C., Andrews, B., Chance, K., **Cottrell, E.**, Buchwitz, M., Reuter, M., Schneising, O., and Burrows, J., "CO₂ release of the Kasatochi eruption in August 2008 as detected from space," Fall Meeting of the American Geophysical Union, 2013.
- [‡]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.

- [‡]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.
- [†]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
- [†]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 geotherobarometry 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**
- [‡]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.
- [‡]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.
- [‡]Popp, C., Andrews, B. J., Chance, K., **Cottrell, E.**, Buchwitz, M., Reuter, M., and Schneising, O. "Detection of volcanic CO₂ in the August 2008 Kasatochi eruption plume by SCIAMACHY measurements", IAVCEI Scientific Assembly, 2013.
- [†]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.
- [†]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.
- [†]Brounce M., Kelley, K.A., and **Cottrell, E.** "Evaluating proxies for fO₂ in the Marianas" Goldschmidt, 2013.
- [‡]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.
- [‡]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 [†]Brounce, M. "The relationship between f_{O_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.
- [‡]Grocholski, B. and **Cottrell, E.** "Water storage capacity of dense, lower mantle minerals." 44th Lunar and Planetary Science Conference, 1303, 2013.
- [‡]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.**
- [†]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.

- †*Brounce M.N.*, Kelley, K.A., and **Cottrell E.**, “Fe³⁺/ΣFe variation in Mariana arc and back-arc magmas and primary fO₂ 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.**
- ‡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.**
- †*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.
- †*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.
- †*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.
- †*Posner, E.*, **Cottrell, E.**, Kelley K.A., †*Parks B.*, †*Ruebush E.* “Micro XANES determination of Fe oxidation state in MORB and its relationship to water content.” *EOS Trans.* V11D-1983. 2009.
- Cottrell E.** and Walter M.J. “Monte Carlo Error Analysis Applied to Core Formation: The Single-stage Model Revived.” *EOS Trans.* V13C-2046. 2009

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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.

Walker D., Kavner A., and **Cottrell E.**, “Core-Mantle Geochemical Interactions.” EOS, Transactions, AGU, U51A-03 **INVITED**, 2002.

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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.

Cottrell E., Spiegelman M., and Langmuir C.H., “A Numerical Model to Evaluate the Importance of Diffusive Exchange Between Melt Inclusions and Host Crystals.” EOS, Transactions, AGU, V71A-30, Fall Meeting, 2000.

Cottrell E., Rutherford M.J., Gardner J., “Conflicting Evidence for Pre-Eruptive Conditions and Processes in the Minoan Rhyolite, Santorini, Greece.” EOS, Transactions, AGU, 77, 46, pp. F805, V22A-24 **INVITED**, 1996.

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

- 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
- 2014 Featured guest on NPR's nationally broadcast Science Friday, September 12, 2014: <http://sciencefriday.com/segment/09/12/2014/keeping-an-eye-on-eruptions-around-the-world.html>
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.
http://www.youtube.com/watch?v=X2_bAUWmiW0
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ACADEMIC COLLOQUIA AND MAJOR (> 100 ATTENDEES) PUBLIC LECTURES

- 2021 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
- 2019 L’Institute de Physique du Globe, Paris, France, May
 Laboratoire des Magmas et Volcans, Universite 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

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 (arriving 2021)

Jonathan Tucker (2020 to present)

Dan Rasmussen (2019 to present)

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

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

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.