

Benjamin Alexander Black

Curriculum Vitae

Department of Earth and Planetary Sciences
Rutgers, The State University of New Jersey
Piscataway, NJ

EDUCATION

- Ph.D. Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology, 2013
Dissertation: *Volatiles as a link between planetary interiors and the environment*
Committee: Samuel Bowring (chair), Linda Elkins-Tanton (primary advisor), J. Taylor Perron (second advisor), Jean-Francois Lamarque, Benjamin Weiss
- M.F.A. Creative Writing Program, New York University, 2007
- A.B. Department of Earth and Planetary Sciences, Harvard University, Cambridge, 2005

PROFESSIONAL EXPERIENCE

- 2021-present Assistant Professor, Department of Earth and Planetary Sciences, Rutgers University
- 2016-2021 Assistant Professor, Department of Earth and Atmospheric Science, City College of New York and Program in Earth and Environmental Science, The Graduate Center of the City University of New York
- 2014-2016 Postdoctoral fellow, Department of Earth and Planetary Science, University of California, Berkeley

PUBLICATIONS

Peer Reviewed Journal Articles (*denotes student advisee co-authors)

- 2022 Schmidt, A. and **B.A. Black**. Reckoning with the rocky relationship between eruption size and climate response: towards a Volcano-Climat Index (VCI). *Annual Reviews of Earth and Planetary Sciences*. 50. 627-661.
- 2022 **Black, B.A.**, M. Manga, L. Ojha, M.-A. Longpre, S. Karunatillake, and L. Hlinka*. The history of water in Martian magmas from Thorium maps. *Geophysical Research Letters*. 49. e2022GL098061.
- 2022 Cooke, G., D. Marsh, C. Walsh, **B.A. Black**, and J.F. Lamarque. A revised lower estimate of ozone columns during Earth's oxygenated history. *Royal Society Open Science*. 9 (1).
- 2021 **Black, B.A.**, L. Karlstrom, and T.A. Mather. The life cycle of Large Igneous Provinces. *Nature Reviews Earth & Environment*. 1-18.

- 2021 **Black, B.A.**, J.F. Lamarque, D. Marsh, A. Schmidt, and C. Bardeen. Global climate disruption and shelters after the 74 ka Toba supereruption. *Proceedings of the National Academy of Sciences of the USA*. 118 (29).
- 2021 Hernandez-Nava, A.*, **B.A. Black**, S.A. Gibson, R.J. Bodnar, P.R. Renne, and L. Vanderkluysen, L. Reconciling early Deccan Traps carbon outgassing and pre-KPB global climate. *Proceedings of the National Academy of Sciences of the USA*. 118 (14).
- 2020 **Black, B.A.** and B. Andrews. Petrologic imaging of the architecture of magma reservoirs feeding caldera-forming eruptions. *Earth and Planetary Science Letters* 552.
- 2020 Elkins-Tanton, L.T., S.E. Grasby, **B.A. Black**, R.V. Veselovskiy, O.H. Ardakani, and F. Goodarzi. Field evidence for coal combustion links the 252 My-old Siberian Traps with global carbon disruption. *Geology* 48.
- 2020 Gales, E.*, **B.A. Black**, and L.T. Elkins-Tanton. Carbonatites as a record of the carbon isotope composition of Large Igneous Province outgassing. *Earth and Planetary Science Letters* 535.
- 2019 **Black, B.A.** and S. Gibson. Deep carbon and the life cycle of large igneous provinces. *Elements* 15(5) 319-324.
- 2019 Koepfel, A.*, **B.A. Black**, and S. Marchi. Differentiation in impact melt sheets as a mechanism to produce evolved magmas on Mars. *Icarus* 335.
- 2019 Pavlov VE, F. Fluteau, AV Latyshev, AM Fetisova, LT Elkins-Tanton, **B.A. Black**, SD Burgess, and RV Veselovskiy. Geomagnetic secular variations at the Permian-Triassic boundary and pulsed magmatism during eruption of the Siberian Traps. *Geochemistry, Geophysics, Geosystems*. 20(2). 773-91.
- 2018 **Black, B.A.**, R.R. Neely, J.F. Lamarque, L.T. Elkins-Tanton, C.A. Shields, J.T. Kiehl, M. Mills, and C. Bardeen. Systemic swings in end-Permian climate due to Siberian Traps carbon and sulfur outgassing. *Nature Geoscience* 11. 949-954.
- 2017 **Black, B.A.**, J.T. Perron, D. Hemingway, E. Bailey, F. Nimmo and H. Zebker. Global drainage patterns and the origins of relief on Earth, Mars, and Titan. *Science* 356 (6339), 727-731.
- 2017 **Black, B.A.** and M. Manga. Volatiles and the tempo of flood basalt magmatism. *Earth and Planetary Science Letters* 458, 130-140.
- 2016 **Black, B.A.**, M. Manga, and B. Andrews. Ash production and dispersal from sustained low-intensity Mono-Inyo eruptions. *Bulletin of Volcanology* 78 (8), 57.
- 2016 Li, M., **B.A. Black**, S. Zhong, M. Manga, M. Rudolph, and P. Olson. Quantifying melt flux at mid-ocean ridges from global mantle convection models with plate motion history. *Geochemistry, Geophysics, Geosystems* 17 (7), 2884-2904.
- 2016 **Black, B.A.** and M. Manga. The eruptibility of magmas at Tharsis and Syrtis Major on Mars. *JGR-Planets* 121(6), 944-964.
- 2016 Marchi, S., **B.A. Black**, L.T. Elkins-Tanton, and W.F. Bottke. Massive impact-induced release of carbon and sulfur gases in the early Earth's atmosphere. *Earth and Planetary Science Letters* 449, 96-104.
- 2015 **Black, B.A.** and T. Mittal. The demise of Phobos and development of a martian ring system. *Nature Geoscience* 8 (12), 913-917.

- 2015 Lillis, R.J., J. Dufek, W.S. Kiefer, **B.A. Black**, M. Manga, J.A. Richardson, and J.E. Bleacher. The Syrtis Major volcano, Mars: A multi-disciplinary approach to interpreting its magmatic evolution and structural development. *JGR-Planets* 120 (9), 1476-1496.
- 2015 **Black, B.A.**, R.R. Neely, and M. Manga. Campanian Ignimbrite volcanism, climate, and the final decline of the Neanderthals. *Geology* 43(5), 411-414.
- 2015 **Black, B.A.**, B.P. Weiss, R.V. Veselovsky, L.T. Elkins-Tanton, and A.V. Latyshev. Siberian Traps volcanoclastic rocks and the role of magma-water interactions. *GSA Bulletin* 127 (9-10), 1437-1452.
- 2014 **Black, B.A.**, E. H. Hauri, L.T. Elkins-Tanton, and S.M. Brown. Sulfur isotopic evidence for sources of volatiles in Siberian Traps magmas. *Earth and Planetary Science Letters* 394, 58-69.
- 2014 **Black, B.A.**, J.F. Lamarque, C.A. Shields, L.T. Elkins-Tanton, and J.T. Kiehl. Acid rain and ozone depletion from pulsed Siberian Traps magmatism. *Geology* 42(1), 67-70. (Research highlight in *Nature*)
- 2013 Tewelde, Y., J.T. Perron, P. Ford, S. Miller, and **B.A. Black**. Estimates of fluvial erosion on Titan from sinuosity of lake shorelines. *JGR-Planets* 118 (10), 2198-2212.
- 2013 Burr, D.M., S.A. Drummond, R. Cartwright, **B.A. Black**, and J.T. Perron. Morphology of fluvial networks on Titan: evidence for structural control. *Icarus* 226, 742-759.
- 2012 Burr, D.M., M. Ádámkóvics, V.R. Baker, G.C. Collins, A.D. Howard, R.P. Irwin, M.P. Lamb, J.M. Moore, J.T. Perron, L.S. Sklar, S.A. Drummond, and **B.A. Black**. Fluvial Features on Titan. *GSA Bulletin* 125 (3-4), 299-321.
- 2012 **Black, B.A.**, J.T. Perron, S.A. Drummond, and D.M. Burr. Estimating Erosional Exhumation on Titan from Drainage Network Morphology. *JGR-Planets* 117 (8). (Research highlight in *Nature Geoscience*)
- 2012 **Black, B.A.**, L.T. Elkins-Tanton, M.C. Rowe and I. U. Peate. Magnitude and consequences of volatile release from the Siberian Traps. *Earth and Planetary Science Letters* 317, 363-373.
- 2008 **Black, B.A.** and S.T. Stewart-Mukhopadhyay. Excess Ejecta Craters record episodic ice-rich layers at middle latitudes on Mars. *JGR-Planets* 113 (2).

Peer-reviewed Book Chapters

- 2021 **Black, B.A.**, T. Mittal, F. Lingo*, K. Walowski, and A. Hernandez-Nava. Assessing the environmental consequences of the emplacement and alteration of Large Igneous Province volcanoclastic rocks. In *Environmental change and large igneous provinces: The deadly kiss of LIPs*. AGU Geophysical Monograph 255.
- 2015 **Black, B.A.**, J.F. Lamarque, C.A. Shields, L.T. Elkins-Tanton, and J.T. Kiehl. Atmospheric effects of Large Igneous Province volcanism: a Siberian perspective. In *Volcanism and global environmental change*, Cambridge University Press, Cambridge, UK.

Submitted/In Review/Under revision

- Black, B.A.**, and S. Marchi. Ascent and intrusion of buoyant impact melts on ancient Mars. In review at *JGR Planets*.
- Black, B.A.**, and S. Aiuppa. Carbon release from alkaline and tholeiitic LIP magmas from trace element ratios. In review at *Volcanica*.
- Black, B.A.**, and M. Brounce. Linking impact melt redox and crustal weathering regime. In review at *Geology*.

FELLOWSHIPS & AWARDS

- 2023 Sloan Research Fellowship
- 2023 NSF CAREER Award
- 2020 CUNY Junior Faculty Research Award in Science and Engineering
- 2011 MIT EAPS Award for Excellence in Teaching
- 2009 NSF Graduate Research Fellowship
- 2008 Lewis and Clark Field Scholar for Astrobiology
- 2008 President's Fellowship, MIT
- 2007 Fulbright study/research award, Iceland

INVITED TALKS AND LECTURES

- 2023 Departmental seminar, Drexel University (scheduled); Institute Colloquium, Columbia Lamont-Doerty Earth Observatory (scheduled)
- 2022 Departmental seminar, Baylor University; Departmental seminar, Rutgers University.
- 2021 Virtual departmental seminar, Zhejiang University.
- 2020 Departmental seminar, Queens College; Departmental seminar, Rutgers University.
- 2019 Departmental seminar, University of Arizona; Departmental seminar, CUNY Graduate Center; Departmental seminar, Princeton University. Keynote address, Gordon Research Conference on Geochronology. Invited speaker, American Geophysical Union Fall Meeting.
- 2018 Departmental seminar, American Museum of Natural History; Departmental seminar, Brooklyn College; Departmental seminar, Syracuse University; Departmental seminar, Montclair State University; Departmental seminar, National Center for Atmospheric Research. Invited speaker, DCO Catastrophic Perturbations to Earth's Carbon Cycle Workshop. Keynote address, Goldschmidt conference.
- 2017 Departmental seminar, Princeton University; Departmental seminar, Queens College.
- 2016 Geodynamics seminar, Columbia University. Invited speaker, Geological Society of America Annual Meeting. Invited speaker, Workshop on understanding volcanic eruptions, U.S. National Academy of Sciences, Engineering, and Medicine.
- 2015 Bromery Lecture, Johns Hopkins University; Departmental seminar, University of California, Berkeley; Departmental seminar, City College of New York; Departmental seminar, San Jose State University; Departmental seminar, Southwest Research Institute; Hazards seminar, USGS Volcano Hazards Program.

Research support

- PI NSF CAREER: Tracking mantle carbon through the life cycle of Large Igneous Provinces (January 2023-December 2027)

- Co-PI NSF: How faithfully wedded are embayments and magma ascent? (September 2020-August 2023)
- Co-PI NSF: Flood volcanism and environmental impacts -- A multidisciplinary investigation of the Deccan Traps and events at the Cretaceous-Paleogene boundary (August 2016-August 2020)
- Co-I NASA: Environmental Consequences of Asteroidal Bombardment on Early Mars (September 2016-September 2020)
- Co-I NASA: Mantle plumes and volcanism through Martian history (March 2019-February 2022)
- PI AGU Centennial grant: The New York Virtual Volcano Observatory (2019)

Pending and planned proposals

- PI NSF: Crystal records of the initiation and timescales of individual Columbia River flood basalt eruptions (pending, submitted to *Petrology and Geochemistry* 5/2022)
- PI NSF FRES: After the catastrophe: the waning phases of LIP outgassing and the tempo of recovery from climate disruptions (pending, submitted to *Frontier Research in Earth Sciences* 2/2023)

Scientific Leadership

Peer Review

National Science Foundation (2015; 2016; 2018; 2019, four times; 2020, two times; 2022; 2023), Icelandic Research Fund (2021), German Research Foundation (2022), *Science Advances* (2022, twice; 2023), *PNAS* (2020, twice; 2021, twice; 2022), *Volcanica* (2021), *Icarus* (2013; 2014; 2016; 2017), *Geology* (2015; 2016; 2017), *Nature Geoscience* (2014; 2015; 2018, twice), *Nature Communications* (2021), *Earth and Planetary Science Letters* (2013; 2016, twice; 2017, twice; 2019, twice; 2022), *Geomorphology* (2014), *Journal of Geophysical Research-Planets* (2018, twice), *G-cubed* (2017, 2018, 2022), *Palaeo3* (2016), *Journal of the Geological Society* (2018), *Journal of Volcanology and Geothermal Research* (2018), *Journal of Petrology* (2022).

To Profession

Magmatic Drivers of Eruption working group member, Subduction Zone 4D initiative (ongoing)

Co-director, the New York Virtual Volcano Observatory outreach program, offering thousands of members of the public annually the opportunity to explore a volcano and learn about geologic processes (2019-present)

Guest Associate Editor, Deep Carbon Observatory Early Career Scientist Special Issue, *Frontiers in Earth Science* (2017)

Co-organizer, VolcaNYC volcano science symposium (2018-present)

To Community

Rutgers EPS Beautification Committee, 2021-present; Rutgers EPS graduate committee, 2022-present; Rutgers EPS Seminar Committee, 2022-present; Rutgers EPS Search Committee, 2022-2023

CCNY: CCNY Campus Fulbright Interviews, 2017, 2018, 2019, 2020; Cosloy Blank Lectureship Committee, 2016-2021; Tech Committee, 2015-2021

Guest lecturer, Extinctions course at AMNH, Sept. 2018; Major Events course at Rutgers EPS, 2021, 2022

Conference Sessions Organized

- 2023 “Hydrothermal systems in continental settings on Earth and beyond.” GSA Connects Annual Meeting, Pittsburgh, PA.
- 2022 “Turning Earth Inside Out: Large Igneous Provinces, Mantle Plumes, and the co-evolution of Earth’s interior and surface environments.” American Geophysical Union Fall Meeting, Chicago, IL, December 12-16.
- 2020 “Building the SZ4D Magmatic Drivers of Eruption Theme: Geologic Evidence from Active and Exhumed Arcs.” GSA 2020 Connects meeting.
- 2018 “Storage, cycling, and environmental consequences of magmatic volatile transfer from the mantle to the atmosphere.” American Geophysical Union Fall Meeting, Washington, DC, December 10-14.
- 2017 “Large Igneous Provinces from the Mantle to the Atmosphere.” American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15.
- 2017 “New Approaches Using Statistics in Volcanology.” IACVEI Scientific Assembly, Portland, OR, August 14-18.
- 2012 “Magmatism and Global Environmental Change.” American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16.
- 2011 “LIPs: teleconnections between geological processes and mass extinctions.” European Geosciences Union General Assembly, Vienna, Austria, April 3-8.