

Current appointment

Sept. 2025 The University of Arizona, Postdoctoral Research Associate, *LaserChron-AHIL*

Education

Fall 2020–Fall 2025 Washington State University, Ph.D. in Geology, *School of the Environment*

2015–2017 Universidad Nacional de Colombia, Master of Engineering - Mineral resources, *School of Mines*

2009–2015 Universidad Nacional de Colombia, Engineering Geologist, *School of Mines*

Academic Publications

Journal Paper 2025 Bolhar, R., Hofmann, A., Whitehouse, J., Maas, R., Kamber, B.Z., Vervoort, J.D., Jeon, H., Botero, M., Bekker, A., Kabete, J. (2026). Eoarchean TTG formation via melt-solid interaction at the base of the Tanzania Craton inferred from multi-proxy detrital zircon data, *EARTH AND PLANETARY SCIENCE LETTERS*, 676, 119701

Journal Paper 2025 Botero, M., Vervoort, J.D., and Meira, V.T. (2025) Tracing primary signatures in Eo-Paleoarchean terranes: Mineral-scale constraints on disturbed bulk-rock isotope records, *EARTH AND PLANETARY SCIENCE LETTERS*, 671, 119668

Journal Paper 2025 Botero, M., Vervoort, J.D., Meira, V.T., de Sousa, D.F.M., Santos, T.J. (2025) U-Pb and Lu-Hf isotopic evolution of 3.6 Ga remnants in NE Brazil – implications on Eo-Paleoarchean global crustal evolution, *CHEMICAL GEOLOGY*, 678, 122646, 678, 122646

Journal Paper 2023 Botero, M., Vervoort, J.D., and Corfu, F. (2023) Archean to Paleoproterozoic magmatic and metamorphic evolution of the Lofoten–Vesterålen area in northern Norway through zircon U-Pb and Hf isotopic analysis, *PRECAMBRIAN RESEARCH*, 397, 107168

Journal Paper 2023 Botero, M., Vinasco, C.J., Restrepo-Moreno, S.A., Foster, D.A., Kamenovet, G.D. (2023) Caribbean–South America interactions since the Late Cretaceous: Insights from zircon U–Pb and Lu–Hf isotopic data in sedimentary sequences of the northwestern Andes, *JOURNAL OF SOUTH AMERICA EARTH SCIENCES*, 104231

Journal Paper 2015 Botero, M., Marin, S.P., and Vinasco, C.J. (2015) Shape preferred orientation studies for hand specimens and rock outcrop through digital image processing, *BOLETÍN DE CIENCIAS DE LA TIERRA*

Academic Publications submitted

Under review Botero, M., Vervoort, J. D., and Hofmann, A. Tracking Archean Crustal Growth of the Zimbabwe Craton through an integrated geochronology and isotope geochemistry approach, JOURNAL: *GEOCHIMICA ET COSMOCHIMICA ACTA*

Invited department seminars

University of Arizona Tracing primary signatures in Eo-Paleoarchean terranes: Mineral-scale constraints on disturbed bulk-rock isotope records, DEPARTMENT OF GEOSCIENCES COLLOQUIUM, Fall 2025

University of Johannesburg The Paleoarchean crustal record of the northern São Francisco craton from U-Pb, Hf, and Nd isotope systematics, DEPARTMENT OF GEOLOGY, Sept. 2023

Peer-reviewed conference proceedings

Oral presentation 2024 Botero, M., Vervoort, J.D., and Meira, V.T., (2024, August) Evaluating the bulk-rock Hf and Nd isotope record: implications for the crust-mantle evolution of the Earth, GOLDSCHMIDT (CHICAGO, USA)

Oral presentation 2023 Botero, M., Vervoort, J.D., and Meira, V.T., (2023, July) The Paleoarchean record of the São Francisco craton from zircon U–Pb and Hf isotope systematics, 6IAS (PERTH, AUSTRALIA) - GRANITOIDS, CONTINENTS, LIFE AND PUNS: A WORKSHOP IN TRIBUTE TO HERVÉ MARTIN (CLERMONT-FERRAND, FRANCE)

Poster - 2023 **Botero, M., Vervoort, J.D., and Meira, V.T., (2023, July) The Paleoarchean record of the Sao Francisco craton from zircon U-Pb and Hf isotope systematics, GOLDSCHMIDT (LYON, FRANCE),** <https://doi.org/10.7185/gold2023.14639>

Poster - 2022 **Botero, M., Vervoort, J. D., and Corfu, F., (2022, March) Crustal Evolution of the Lofoten - Vesteralen Area in Norway Through Solution Hf Isotope, Coupled U-Pb and Hf Isotopic Analysis and Garnet Geochronology, GPSA RESEARCH EXPOSITION - WSU**

Poster - 2021 **Botero, M., Vervoort, J. D., and Corfu, F., (2021, December) Crustal Evolution of the Lofoten - Vesteralen Area in Norway Through Solution Hf Isotope, Coupled U-Pb and Hf Isotopic Analysis and Garnet Geochronology. In AGU Fall Meeting Abstracts (Vol. 2021 DI25A-0020), AGU - 2021**

Oral presentation
2017 **Botero, M., Vinasco, C. J., and Restrepo, S.A., (2017, August) Provenance of the Penderisco and Beibaviejo Formations through U-Pb and Hf analysis, CONGRESO COLOMBIANO DE GEOLOGÍA (CCG) 2017**

Poster - 2017 **Botero, M., et al. (2017, August) Tectono-thermal evolution of the Mande Batholith through thermo-kinematic inverse modelling: implications on the Panama-Choco Block evolution, CONGRESO COLOMBIANO DE GEOLOGÍA (CCG) 2017**

Poster - 2015 **Botero, M., et al. (2015, August) Thermal modelling of Mande batholith through low temperature thermo-chronology (ZFT, ZHe and AHe), CONGRESO COLOMBIANO DE GEOLOGÍA (CCG) 2015**

Poster - 2014 **Botero, M., et al. (2014, April) Timing of accretion and mountain-building response in the northern Andes of Colombia through low-temperature thermochronology analysis, 9TH SOUTH AMERICAN SYMPOSIUM ON ISOTOPE GEOLOGY (SSAGI)**

Grants

2022 - 2025 **National Science Foundation–Division of Earth Sciences, P.I. JEFFREY VERVOORT, WSU**
Title: The Paleoarchean–A Pivotal Time in Earth Crustal Evolution—the View from the Zimbabwe and Sao Francisco Cratons
Grant number: 2222254
Amount awarded: 273,218.00 USD
Role on Project: Research assistant - Ph.D. student

Summer 2025 **Graduate Scholarship , W. FRANK SCOTT ENDOWMENT - WSU, 2241.77 USD**

Summer 2025 **Graduate Scholarship , JAMES W. CROSBY MEMORIAL SCHOLARSHIP - WSU, 2000 USD**

Summer 2024 **Graduate Scholarship , REYNOLDS-BIERSNER SCHOLARSHIP IN GEOLOGY - WSU, 3000 USD**

Summer 2024 **Graduate Fellowship, ROGER V. LECLERC II MEMORIAL FELLOWSHIP - WSU, 1500 USD**

2020 - 2024 **Fulbright-Minciencias, SCHOLARSHIP FOR A DOCTORAL DEGREE, 310,869.24 COP / ~80000 USD**

July 2023 **Planetary Science Grant-NASA, GOLDSCHMIDT TRAVEL GRANT, 1000 USD**

July 2023 **6th International Archean Symposium travel grant, 6IAS TRAVEL GRANT, 2000 AUD**

2023 - 2024 **Graduate Scholarship, SCHROEDER SCHOLARSHIP IN GEOLOGY - WSU, 4500 USD**

2023 - 2024 **The Geological Society of America (GSA), GRADUATE STUDENT RESEARCH GRANT, 2500 USD**

2022 - 2023 **Graduate Scholarship, CRAFT FAMILY SCHOLARSHIP - WSU, 2100 USD**

Fall 2022 **Graduate Fellowship, H. WALTER AND JEANNETTE PRAETORIUS - EXXON - WSU, 3400 USD**

Summer 2022 **Graduate Fellowship, WILLIAM & MARY LYNN GRABER ENDOWMENT IN SCIENCES - WSU, 4000 USD**

2022 - 2023 **The Geological Society of America (GSA), GRADUATE STUDENT RESEARCH GRANT, 2000 USD**

Fall 2021 **Graduate Fellowship, H. WALTER AND JEANNETTE PRAETORIUS - EXXON - WSU, 2000 USD**

Honors and Awards

September 2025 **Ten Outstanding Young Persons 2025 regional section. Awardee in leadership and academic achievements, TOYP - QUINDIO, COL**

August 2025 **Recognition to the leadership and achievements in academia and science, HOUSE OF REPRESENTATIVES - QUINDIO, COL**

March 2025 **College of Arts and Sciences Doctorate Student Achievement Award - in the Sciences, CAS - WSU**

May 2024 **Outstanding Graduate Student Researcher/Research Assistant Award**, SCHOOL OF THE ENVIRONMENT - WSU

2016 - 2017 **Universidad Nacional of Colombia**, ACADEMIC EXCELLENCE SCHOLARSHIP

Research Experience

Fall 2025 - present **Postdoctoral research**, UNIVERSITY OF ARIZONA

- Early Earth evolution from short-lived radionuclides
- Postdoctoral research associate at LASERCHRON

Fall 2020 - Fall 2025 **Ph.D. research project**, WASHINGTON STATE UNIVERSITY

- Creating Earth's earliest continents - the view from the Zimbabwe and Sao Francisco cratons (UPb, Lu-Hf, and Sm-Nd isotope systematics)
- Crustal evolution of the Lofoten - Vesterålen area in Norway through solution Hf isotope and coupled U-Pb and Hf isotope analysis.

2016 - 2018 **Master's research project**, U. NACIONAL DE COLOMBIA

- Provenance and structural response of the Penderisco and Beibaviejo formations: Implications on the Cenozoic accretionary history of the northern Andes of Colombia.

Fall 2016 **Research visitor**, UNIVERSITY OF FLORIDA (UF)

- U-Pb and Hf isotope analysis
- Zircon and Apatite U-Th-He dating

2013 - 2015 **Research assistant**, U. NACIONAL DE COLOMBIA

- Timing of accretion and mountain-building response in the northern Andes of Colombia through low-temperature thermochronology analysis

2014 **Undergraduate student in research project**, U. NACIONAL DE COLOMBIA

- Study and installation of a GigaPan system for digital image analysis in structural geology applications through textural studies on rock outcrops with high resolution photography

April 2014 **Research visitor**, UNIVERSITY OF SÃO PAULO, Brazil

- Shape preferred orientation in rock samples

Teaching and Mentoring Experience

Spring - Fall 2024 **Mentoring high-school level student Azumi Valencia - Tracking Archean Crustal Growth of the Zimbabwe Craton through Modern Sediments**, WSU, School of the Environment

Fall 2024 **Teaching assistant of Field Skills for Earth Scientists**, WSU, School of the Environment, USA

Spring 2022 **Teaching assistant of Earth's History and Evolution**, WSU, School of the Environment, USA

Spring 2021 **Teaching assistant of Introduction to Geology**, WSU, School of the Environment, USA

Spring 2020 **Instructor of Structural Geology**, U. ESCUELA DE INGENIERIA DE ANTIOQUIA - EIA, Colombia

2018 - 2020 **Instructor of Laboratory of Physical Geology**, U. NACIONAL DE COLOMBIA, School of Mines, Colombia

Summer 2019 **Instructor of Geology for Engineers and Fundamental of Geotechnical Engineering**, POLITECNICO JAIME ISAZA, Faculty of Engineering, Colombia

Summer 2019 **Academic advisor of internships in Civil Engineering**, POLITECNICO JAIME ISAZA, Faculty of Engineering, Colombia

2017 - 2018 **Instructor of Analysis of Geological Structures**, U. NACIONAL DE COLOMBIA, School of Mines, Colombia

2016 - 2017 **Teaching Assistant of Tectonic and Structural Geology**, U. NACIONAL DE COLOMBIA, Faculty of Mines, Colombia

Outreach and Service Activities

2024 **Invited speaker**, WSU, 4H Teen conference

2024 **Co-organizer of Earth sciences workshop – The Floor is Lava**, WSU, 4H Teen conference

2024-2025 **Critical minerals search committee member**, WSU, School of the Environment

2023-2025 **President of the Geology Club**, WSU, School of the Environment

- Organizing weekly coffee hours
- Organizing field trips with undergraduate and graduate students
- Leading monthly DEI discussions

2022 and 2023 **Fulbright Scholarship Proposal Review Panel**, COLOMBIA

2022 **Grants and Contracts Coordinator hiring committee member**, WSU, School of the Environment