

Gabriel Johnston

PhD Candidate, Department of Geologic Sciences

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Education

- **PhD Candidate, Geologic Sciences** Fall 2020 – Present
University of Florida, Gainesville, FL
Thesis: *Reconciling Hotspot Geochemistry with Mantle Dynamics through Particle Tracking*
Advisor: Professor Allesandro Forte
Coursework/Research in conjunction with the Institute of Global Physics, Paris
- **Bachelor of Arts, Astronomy and French Literature** May 2019
University of Florida, Gainesville, FL
Minors: Physics, Geology, Music Performance
- **Year Abroad** Spring 2016 – Fall 2016
Université Paris Diderot & Institut Catholique de Paris, Paris, France
Studied Literature, Astronomy, and conducted research in Second Language Acquisition.

Research Experience

- **Graduate Research in Computational Geophysics** Fall 2020 – Present
University of Florida
 - Developed advanced particle-tracking methods in 4D global mantle convection models integrating seismic tomographic data and geochemical data. This research aims to clarify the origin and evolution of hotspot-related chemical anomalies by reconstructing mantle flow through geologic time.
- **Undergraduate Research in Star Formation** Fall 2018 – Fall 2019
University of Florida
 - Developed Python code for near-infrared photometry and photometric analysis as part of the Galactic Census of High and Medium-mass Protostars (CHaMP) under Dr. Peter Barnes.
- **Undergraduate Research in Second Language Acquisition** Spring 2016
Collège Robert Doisneau, Paris, FR
 - Taught English to French middle schoolers.
 - Assisted in research on language pedagogy under Professors Yamina Bonin and Laetitia Boisdron.

Teaching Experience

- **Teaching Assistant** Fall 2020 – Present
Florida Geology Lab, University of Florida
 - Designed lectures, labs, and quizzes; served as instructor of record on five occasions.
 - Led field trips to various destinations in Florida.

Projects & Hackathons

- **ASPECT Hackathon**

May 2024

Advanced Solver for Planetary Evolution, Convection, and Tectonics

- Developed C++ implementations for particle tracking methods in mantle convection.
- Evaluated alternative Runge–Kutta schemes, including the 3/8th method, performing cost-benefit analysis and testing feasibility of embedded methods in ASPECT.

Publications & Presentations

- **Playing with Edges: The Influence of Arbitrary Definitions on Hotspot–LLSVP Correlations**

EGU General Assembly 2025 (January 15, 2025), Vienna, Austria. doi.org/10.5281/zenodo.14740086

Co-authors: G. Johnston, S. Liu, A. Forte, & P. Glisovic

- **Towards a New Geodynamic and Geochemical Reconciliation of the Origin of the DUPAL Geochemical Anomaly in the South Atlantic and Southwest Indian Oceans**

2024 Ada Lovelace Workshop on Modelling Mantle and Lithosphere Dynamics (September 3, 2024), Sète, France. doi.org/10.5281/zenodo.14706576

Co-authors: G. Johnston, A. Forte, P. Glisovic, C. Chauvel, C. Farnetani, & B. Robert

- **Testing Models for Three-Component Mantle Heterogeneity as Recorded in Compositions of Lavas from the Off-Axis 8°20' N Seamount Chain**

Goldschmidt 2022 (January 2022). doi:10.46427/gold2022.12742

Co-authors: M. Anderson, M. Perfit, D. W. Graham, & G. Johnston

- **Time-Dependent Convective Modelling of DUPAL Signatures in the South Atlantic: Implications for LLSVP Source Region**

AGU Fall Meeting 2021 (December 2021), New Orleans, LA, ID: DI44B-07, Bibcode: 2021AGUFMDI44B..07J

Co-authors: G. Johnston, A. Forte, & P. Glisovic

Additional Information

- **Languages:** English (native), French (professionally fluent)
- **Technical Skills:** Python (Highly Fluent), C++ (Proficient), Fortran (Competent), GMT, ASPECT
- **Awards:** Summer 2022 Sinks Fellowship (\$3,250), Grinter Award 2024 (\$4,000)
- **Professional Affiliations:** European Geosciences Union, American Geophysical Union