

## George L. Guice

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### RELEVANT EMPLOYMENT

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- \*upcoming** Postdoctoral researcher, Johns Hopkins University (starting March 2022)
- Jul. 2019–present** Peter Buck Postdoctoral Fellow, Smithsonian National Museum of Natural History
- Sep. 2018–Sep. 2019** Freelance scientific editor, Stallard Scientific Editing
- Oct. 2015–May 2019** Postgraduate field and laboratory demonstrator, Cardiff University

### EDUCATION

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**2019 PhD, Cardiff University (UK)**

Thesis title: Origin and geodynamic significance of Archean ultramafic-mafic complexes in the Kaapvaal and North Atlantic cratons. Available [here](#).

Advisors: Dr Iain McDonald; Dr Hannah Hughes; Prof. Carl Anhaeusser.

**2015 MSc Mining Geology, Camborne School of Mines, University of Exeter (UK).**

Dissertation title: The characteristics and genesis of the Sotkavaara Intrusion, northern Finland, including PGE mineralisation.

Award: Merit.

**2014 BSc Geology (major), with Physical Geography, University of Keele (UK).**

Award: First class, with honours

### INVITED RESEARCH TALKS

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2021: "Using ultramafic rocks to reconstruct complex geological evolution: case studies from Maryland (USA) and Scotland (UK)". *American Museum of Natural History webinar*.

2021: "Suprasubduction zone (SSZ) ophiolite fragments in Maryland: Evidence for mantle and Moho in the Baltimore Mafic Complex". *USGS webinar*.

2021: "Using ultramafic rocks to reconstruct complex geological evolution: case studies from Maryland (USA) and Scotland (UK)". *George Mason University webinar*.

2020: "Suprasubduction zone ophiolite fragments in the central Appalachian Orogen: evidence for mantle and Moho in the Baltimore Mafic Complex, Maryland". *University of Maryland*. Available [here](#).

2020: "How did Earth operate 3 billion years ago? Insights from rural Scotland and urban Johannesburg". *Senate of Scientists Lightning Talks, National Museum of Natural History, Smithsonian Institution*.

2020: "Are High Field Strength Element anomalies a good proxy for Archean subduction?". *Carnegie Earth & Planets Laboratory*. Full lecture available [here](#).

2019: "Are High Field Strength Element anomalies a good proxy for Archean subduction? Evidence from the Ben Strome Complex, NW Scotland". *University of Campinas & University of Ouro Preto, Brazil*

## PUBLICATIONS

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### Invited book chapters in preparation:

10. Goodenough, K., Bird, A., Dempsey, E., Guice, G., Hughes, H., Johnson, T. (In Prep). Geology of Scotland (5<sup>th</sup> edition): The Archean and Paleoproterozoic rocks of Scotland. Geological Society of London. Expected publication date: 2022.

### In review/In revision papers:

9. Guice, G. L., Magalhães, J. R., Pinheiro, M. A. P., Ferreira, R. C. R., Meira, V. T., Melo-Silva, P., Ackerson, M. Spinel-group mineral chemistry as a petrogenetic indicator of altered ultramafic rocks: evidence from the Morro do Onça metakomatiites, São Francisco Craton (Brazil). *Contributions to Mineralogy & Petrology*.
8. Guice, G. L., Miocevic, S. R., Hughes, H. S. R., McDonald, I., Goodenough, K. G., Ackerson, M. R., MacDonald, J. M., Faithfull, J. W. Origin of ultramafic–mafic bodies on the Isles of Lewis and Harris (Scotland, UK): constraints on the Archean–Paleoproterozoic evolution of the Lewisian Gneiss Complex, North Atlantic Craton. *Precambrian Research*.

### Published papers:

7. Pinheiro, M. A. P., Guice, G. L., Magalhães, J. R. (2021, in press) Archean–Ediacaran evolution of the Campos Gerais Domain — a reworked margin of the São Francisco paleocontinent (SE Brazil): Constraints from metamafic–ultramafic rocks. *Geoscience Frontiers, Special Issue: Archean–Paleoproterozoic Crustal Evolution of South America*. Available [here](#).
6. Guice, G. L., Ackerson, M. R., Holder, R. M., George, F. R., Browning-Hanson, J., Burgess, J. L., Foustoukos, D. I., Becker, N. A., Nelson, W., Viète, D. R. (2021) Suprasubduction ophiolite fragments in the central Appalachian orogen: evidence for the mantle and Moho in the Baltimore Mafic Complex (Maryland, USA). *Geosphere*. 17, 1-21. Available [here](#).
5. Guice, G. L., McDonald, I., Hughes, H. S. R., MacDonald, J. M., Faithful, J. W. (2020) The origin(s) and geodynamic significance of Archean ultramafic–mafic bodies in the mainland Lewisian Gneiss Complex, North Atlantic Craton. *Journal of the Geological Society*. 177(4), 700-717. Available [here](#).
4. Guice, G. L., McDonald, I., Hughes, H. S. R., Anhaeusser, C. R. (2019) An Evaluation of Element Mobility in the Modderfontein Ultramafic Complex, Johannesburg: Origin as an Archean Ophiolite Fragment or Greenstone Belt Remnant. *Lithos*. 332-333, 99-119. Available [here](#).
3. Guice, G. L., McDonald, I., Hughes, H. S. R., Schlatter, D. M., Goodenough, K. M., MacDonald, J. M., Faithfull, J. W. (2018) Assessing the validity of negative high field strength-element anomalies as a proxy for Archean subduction: evidence from the Ben Strome Complex, NW Scotland. *MDPI Geosciences Special Issue: Geology of the Early Earth*. 8(9), 338. Available [here](#).
2. Guice, G. L., McDonald, I., Hughes, S. R., MacDonald, J. M., Blenkinsop, T. G., Goodenough, K. M., Faithfull, J. W., Gooday, R. J. (2018) Re-evaluating ambiguous age relationships in Archean cratons: Implications for the origin of ultramafic-mafic complexes in the Lewisian Gneiss Complex. *Precambrian Research*. 311, 136-156. Available [here](#).
1. Guice, G. L., Törmänen, T., Karykowski, B. T., et al. (2017) Precious metal mineralisation in the Sotkavaara Intrusion, northern Finland: Peak Pt, Pd, Au and Cu offsets in a small intrusion with poorly-developed magmatic layering. *Ore Geology Reviews*. 89, 701-718. Available [here](#).

## RESEARCH EXPERIENCE: ANALYTICAL METHODS

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**Electron Microprobe (EMPA).** Advanced operating proficiency. Utilized for major element spot analysis of a variety of mineral phases, major element mapping, and linescans.

**Scanning electron microscopy (SEM).** Advanced operating proficiency. Utilized for high resolution imaging and major element spot analyses.

**Laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS).** Moderate operating proficiency. Utilized for *in-situ* trace element mapping and spot analyses.

**Solution-based ICP-optical emission spectrometry (ICP-OES).** Moderate operating proficiency. Utilized for major element analyses of powdered rock samples.

**X-ray fluorescence (XRF) and portable XRF.** Moderate operating proficiency. Utilized for major element analyses of powdered rock samples and *in-situ* analyses.

**Other rock preparation and laboratory experience.** Polished thin sections and polished 1" round block preparation; rock cutting and powdering; optical microscopy (transmitted and reflected light)

## RESEARCH EXPERIENCE: FIELDWORK

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2021: One week studying eclogites and blueschists in the Franciscan Complex, California (USA).

2021: One week studying/sampling ultramafic–mafic bodies in Virginia, N. Carolina & S. Carolina (USA).

2019: Four weeks detailed fieldwork (mapping, logging, structural assessments and sampling) studying Archean ultramafic, mafic and metasedimentary lithologies in the São Francisco Craton, Brazil.

2019–2020: Two weeks fieldwork studying/sampling ultramafic–mafic bodies and associated chromitite deposits in Maryland and Pennsylvania (USA).

2016–2018: Fifteen weeks conducting detailed mapping, sampling, structural surveys and reconnaissance surveys of Archean ultramafic–mafic rocks in remote parts of NW Scotland and the Outer Hebrides.

2017: Three days fieldwork logging the Stac Fada Member (proposed impact ejecta), NW Scotland.

2017, 2015, 2013: Seven weeks (total) voluntary fieldwork on Mount Etna (Sicily), assisting Dr John Murray.

2016: Four weeks fieldwork studying Archean greenstone belts, Johannesburg Dome (South Africa).

2016: One-week fieldtrip to the Outer Hebrides, led by Dr Kathryn Goodenough and Dr Hannah Hughes.

2016: One-week of field and mine visits, SEG student chapter fieldtrip, Finland.

2015: Three-weeks of drillcore logging and fieldwork, studying the origin of platinum-group element (PGE) mineralization the Sotkavaara Intrusion (Finland).

## TEACHING EXPERIENCE

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### Undergraduate and public lectures:

2021: "Playing golf on ancient ocean crust: geology of the Baltimore Mafic Complex". Lecture to the Natural History Society of Maryland & Baltimore Mineralogical Society.

2020 & 2021: "How did Earth operate during the Archean?" Lecture to Year 4 undergraduates, UNICAMP.

2019: "The evolution of the 3.2 Ga Lewisian Gneiss Complex: a mineralogical perspective". Mineralogical Society of the District of Columbia, Washington D.C.

2019: "The Lewisian Gneiss Complex: 150 years of research and counting". Lecture to Year 4 undergraduate students. University of Campinas (UNICAMP).

2017: "An introduction to igneous rocks" Lecture to year 1 undergraduates, Cardiff University.

**Field courses taught (as postgraduate field demonstrator, Cardiff University):**

2016, 2017, 2018: Residential field course to Pembrokeshire (1 week) for Year 1 students.

2016, 2017: One-week residential field course to Arran for Year 2 students. Includes mapping training.

2016–2018: Over 20 one-day fieldtrips to field sites in South Wales, including mapping training.

**Laboratory classes taught (as postgraduate laboratory demonstrator, Cardiff University)**

2015: Year 1 (BSc) Introduction to Earth System Science (Introductory Geology course)

2015: Year 1 (BSc) Geographical information systems

2016: Year 1 (BSc) Formation of the British Isles

2016: Year 1 (BSc) Earth Materials

2017, 2019: Year 2 (BSc) Geological Resources

2017, 2018: Year 2 (BSc) Metamorphic Petrology

2016, 2017, 2018: Year 3 (BSc) Applied Mineralogy

**Student supervision:**

2019–present: Naomi Becker, PhD, Johns Hopkins University.

2018: Ellis Krishan, MEd, Cardiff University.

**GRANTS, AWARDS, FELLOWSHIPS AND BURSARIES**

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2022: Clough Memorial Award, Edinburgh Geological Society.

In review: National Science Foundation (NSF), USA. "Comparing the Paleoproterozoic and Phanerozoic: Insights from 1.9 Ga ophiolites in North America". Other personnel: Celine Martin (American Museum of Natural History); Daniel Viete (Johns Hopkins University). \$ 270,000 (USD).

2019: Peter Buck Postdoctoral Fellowship, Smithsonian Institution. 2-year award. \$ 137,600 (USD)

2018: Granulites & granulites conference poster prize.

2018: Nominated for an Enriching Student Life Award (graduate tutor/demonstrator), Cardiff University.

2018: *Lithos* Outstanding Contribution in Reviewing Award.

2017: Geochemistry Group Travel Bursary. £150 (GBP)

2017: Geological Society, Timothy Jefferson Field Research Fund. £1500 (GBP)

2016: SRK consulting, student oral presentation award, NAC+2016 conference.

2016: Highly Siderophile Element geochemistry conference travel bursary £100 (GBP)

2016: Society of Economic Geologists Graduate Student Fellowship \$5000 (USD)

2016: Mineralogical Society student travel bursary £375 (GBP)

2014: Warwickshire Geology Conservation Group postgraduate award £2500 (GBP)

**PROFESSIONAL ACTIVITIES**

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**Media:**

*Washington Post*, May 2021. "Rocks near Baltimore are ancient fragments of planet's mantle." Link [here](#).

*Baltimore Sun*, May 2021. "What on earth? Fragments of ancient ocean floor, Earth's inner mantle identified in Baltimore-area rocks". Link [here](#).

*National Geographic*, April 2021. "Rare chunks of Earth's mantle found exposed in Maryland". Link [here](#)

### **Communication & outreach:**

2021: Unlearning Racism in Geoscience (URGE) pod member. Smithsonian National Museum of Natural History. For more information: <https://urgeoscience.org/>. \*see also conference abstract below.

2021: National Museum of Natural History Article Club. Lecture, followed by Q&A with volunteers.

2018: Geological Society representative, Voice of the Future event, Houses of Parliament, UK.

2015–2019: STEM (Science, Technology, Engineering and Math) ambassador, South Wales (UK). Involved several primary school, secondary and college visits to engage young people in earth science.

### **Memberships, society responsibilities and conference responsibilities:**

Ongoing: Geological Society of America, Member.

Ongoing: Mineralogical Society of Great Britain and Ireland, Member

2016–2018: Applied Mineralogy Group (Min. Soc. of GB and Ireland) student committee member.

2016–2018: *Applied Mineralogist* (Mineralogical Society of Great Britain and Ireland) lead editor.

2018: Lewisian Gneiss Complex fieldtrip leader and fieldguide co-author. Granulites conference.

2018: Session chair. Granulites & granulites conference.

### **Training and specialist courses attended:**

2021: Phase Equilibrium Modelling E-Workshop: approaches and pitfalls. 5-day course.

2017: Three-day geochemical exploration/ litho-geochemistry course run by Denis Schlatter.

### **CONFERENCES PAPERS (six most recent only)**

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Cottrell, E., Lascu, I., Andrys, J., Ackerson, M., Corrigan, C., Farfan, G., Guice, G., Miller, M., Cole, S., Pobiner, B., et al. Unlearning racism in a federal setting. *AGU 2021, New Orleans, USA*.

Guice, G. L., Ackerson, M. R., Andrew, B. J., Cole, S. R., Corrigan, C. M., Cottrell, E., Farfan, G. A., et al. (2021). Advancing diversity, equity, accessibility, and inclusion at the Smithsonian's National Museum of Natural History: unique opportunities and challenges. *GSA 2021, Portland, USA*. (Poster)

Guice, G. L., Magalhães, J. R., Pinheiro, M. A. P., Ramos, R. C. R., Meira, V. T., Melo-Silva, P., Ackerson, M. R. (2021) Spinel-group mineral chemistry as a record of magmatic and metamorphic processes: evidence from the Morro do Onça komatiites, Minas Gerais (Brazil). *GSA 2021, Portland, USA*. (Talk)

Viete, D. R., Holder, R. M., Guice, G. L., George, F. R. (2021) Metamorphic scales illuminate past tectonic processes. *GSA, 2021, Portland, USA*.

Guice, G. L., Ackerson, M. R., Holder, R. M., George, F. R., Browning-Hanson, J., Burgess, J. L., Foustoukos, D. I., Becker, N. A., Nelson, W., Viete, D. R. (2020). The Baltimore Mafic Complex, Maryland: ophiolite fragments in the southern Appalachian Orogen. *GSA Connects Conference*. (Talk)

Guice, G. L., McDonald, I., Hughes, H. S. R., MacDonald, J. M., Schlatter, D. M., Goodenough, K. M., Faithfull, J. W. (2018) Assessing the origin of Nb anomalies in the Ben Strome Complex: implications for Archean geodynamic interpretations. *Granulites and granulites, Ullapool (UK)*. (Talk)