George Guice

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Google Scholar: https://scholar.google.co.uk/citations?user=FyXL1-wAAAAJ&hl=en

RELEVANT EMPLOYMENT

July 2019 – present **Peter Buck Postdoctoral Fellow, Smithsonian Institution (NMNH)**

Primary research project: Constraining Archean geodynamic regimes in the São Francisco and Amazonian Cratons, Brazil: an integrated field, petrographic and geochemical approach.

Other research projects: Origin and geodynamic significance of Archean ultramafic-mafic rocks in the Outer Hebrides, UK; Origin of ultramafic-mafic rocks in the Appalachians, USA.

Sep. 2018 – Sep. 2019 **Freelance scientific editor, Stallard Scientific Editing**

Role: Editing of scientific manuscripts (written by non-native English speakers) in the fields of: igneous and metamorphic petrology; tectonics; structural geology; and economic geology.

EDUCATION

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

Thesis title: Origin and geodynamic significance of Archean ultramafic-mafic complexes in the Kaapvaal and North Atlantic cratons. http://orca.cf.ac.uk/123339/

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

Dissertation title: The characteristics and genesis of the Sotkavaara Intrusion, northern Finland, including PGE mineralisation http://tupa.gtk.fi/opinnayte/guice_george_gradu.pdf

Industrial partners: Tuomo Törmänen (GTK, Rovaniemi), Bo Johansen and Yann Lahaye (GTK, Espoo).

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

INVITED SEMINARS AND LECTURES

2020*: "Are High Field Strength Element anomalies a good proxy for Archean subduction? Implications for understanding craton evolution". University of Maryland. *Cancelled due to COVID-19 outbreak.

2020: "Are High Field Strength Element anomalies a good proxy for Archean subduction?". Carnegie Institute, Washington, D.C. The full lecture is available here: https://www.youtube.com/watch?v=Ak8ie2xif5Q&t=14s

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

2019: "The Lewisian Gneiss Complex: 150 years of research and counting". Year 4 undergraduate students. University of Campinas, Brazil.

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

PUBLICATIONS

In preparation:

Guice, G. L., Ackerson, M. R., Holder, R. M., Burgess, J. L., George, F. R., Browning-Hanson, J., Foustoukos, D. I., Becker, N., Viete, D. R. Ophiolite fragments in the southern Appalachian Orogen: evidence from the Baltimore Mafic Complex, Maryland. *GSA Bulletin.*

In press:

5. Guice, G. L., McDonald, I., Hughes, H. S. R., MacDonald, J. M., Faithful, J. W. The origin(s) and geodynamic significance of Archean ultramafic-mafic bodies in the mainland Lewisian Gniess Complex, North Atlantic Craton. *Journal of the Geological Society.* https://doi.org/10.1144/jgs2020-013

Published in international, peer-reviewed journals:

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. https://www.sciencedirect.com/science/article/pii/S0024493719300830

3. Guice, G. L., McDonald, I., Hughes, H. S. R., Schlatter, D. M., Goodenough, K. M., MacDonald, J. M., Faithfull, J. W. **(2018b)** Assessing the validity of negative high field strength-element anomalies as a proxy for Archean subduction: evidence from the Ben Strome Complex, NW Scotland. *Geosciences, special issue: Geology of the Early Earth – geodynamic constraints from cratons.* 8(9), 338. https://www.mdpi.com/2076-3263/8/9/338

2. Guice, G. L., McDonald, I., Hughes, S. R., MacDonald, J. M., Blenkinsop, T. G., Goodenough, K. M., Faithfull, J. W., Gooday, R. J. **(2018a)** 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. https://www.sciencedirect.com/science/article/pii/S0301926818300627

1. Guice, G. L., Törmänen, T., Karykowski, B. T., Johanson, B., Lahaye, Y. **(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. https://www.sciencedirect.com/science/article/pii/S0169136817303141

POSITIONS OF RESPONSIBILITY

Conferences:

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

2018: Session chair. Granulites & granulites conference.

Learned Society Committees:

2016-2018: Applied Mineralogy Group (Min. Soc. of Great Britain and Ireland) committee member.

2016-2018: *Applied Mineralogist* (Min. Soc. of Great Britain and Ireland) lead editor.

Student supervision:

2019-present: Naomi Becker (PhD), Johns Hopkins University. Origin of plagiogranites in ophiolites.

2019-present: Leonardo Laurentis (BSc), University of Campinas. Evolution of the Santa Barbara Complex.

2018: Ellis Krishan (MESci), Cardiff University. Origin of Archean ultramafic rocks in the Outer Hebrides.

2017: Four final-year BSc students, Cardiff University. Geological mapping, Ballachulish, Scotland.

RESEARCH EXPERIENCE

Fieldwork:

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

2019: Two weeks of fieldwork studying/sampling the Baltimore Mafic (MD) and State Line (PA) Complexes.

2016-2018: Fifteen weeks independent fieldwork studying Archean ultramafic-mafic rocks in remote parts of NW Scotland and the Outer Hebrides. Includes: mapping of the 7 km^2 Ben Strome Complex (see Guice et al. 2018a); detailed mapping of smaller complexes; and reconnaissance surveys in new areas.

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

2017: Three weeks (voluntary) fieldwork on Mount Etna (Sicily), assisting Dr John Murray, Open University.

2016: Four weeks fieldwork studying fragments of an Archean greenstone belt in the Johannesburg Dome (South Africa), including detailed mapping, logging of key transects and sampling.

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: One-week (voluntary) fieldwork on Mount Etna (Sicily), assisting Dr John Murray, Open University.

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

2015: Two-week fieldtrip (including mine visits), Ontario, Canada, as part of MSc Mining Geology course.

2014-2015: Ten days fieldwork (including mine visits) in Cornwall (UK), as part of MSc Mining Geology course.

2014: Two-week fieldtrip studying Italian volcanoes, as part of BSc Geology course.

2013: One-week (voluntary) fieldwork on Mount Etna (Sicily), assisting Dr John Murray, Open University.

2013: Two-week fieldtrip to SE Spain, as part of BSc Geology course.

2013: Four weeks independent mapping of Carrock Fell and the surrounding area (15 km^2), Lake District (UK).

Analytical methods:

- Laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Utilised for trace element mineral chemistry and analysis of glasses fused for bulk-rock analysis at Cardiff University (2017-2018) and Johns Hopkins University (2020). Basic operating proficiency.
- Electron Microprobe (EMPA). Utilised for quantitative major element mineral chemistry, chemical mapping and linescans at the Smithsonian Institution (2019-2020). Moderate operating proficiency.
- X-ray fluorescence (XRF). Utilised for major and minor element bulk-rock geochemistry at the Carnegie Institution of Washington D.C. (2019-2020). Moderate operating proficiency.
- Scanning electron microscopy (SEM). Utilised for: major element mineral chemistry, chemical mapping and back scattered electron imaging at Camborne School of Mines (2015), the Geological Survey of Finland (2015), Cardiff University (2015-2019) and Smithsonian Institution (2019-2020). Advanced operating proficiency.
- Portable XRF (p.XRF). Utilised for major element analysis at Cardiff University (2019). Basic operating proficiency.

TEACHING EXPERIENCE

Postgraduate field demonstrator (Cardiff University, 2015 – 2019):

2016, 2017, 2018: Residential field course to Pembrokeshire (1 week) for Year 1 students. Primary field leader for St. David's Head field day (focusing on igneous rocks) in 2017 and 2018.

2016, 2017: Residential field course to Arran (1 week) for Year 2 students. Includes mapping training.

2016-2018: Extensive day fieldtrips to field sites in South Wales, including mapping training (2016-2018).

Postgraduate laboratory demonstrator (Cardiff University, 2015 – 2019):

2015: Year 1 Introduction to Earth System Science

2015: Year 1 Geographical information systems

2016: Year 1 Formation of the British Isles

2017, 2019: Year 2 Geological Resources

2017, 2018: Year 2 Metamorphic Petrology

2016, 2017, 2018: Year 3 Applied Mineralogy

AWARDS AND BURSARIES

Awards and honours:

2019: Peter Buck Postdoctoral Fellowship, Smithsonian National Museum of Natural History.

2018: Granulites & Granulites conference poster prize.

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

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

2018: *Lithos* Outstanding Contribution in Reviewing Award.

2016: SRK consulting, student oral presentation award, North Atlantic Craton conference (£120)

Bursaries awarded (value in currency awarded):

2017: Geochemistry Group Travel Bursary (£150)

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

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

2016: Society of Economic Geologists (SEG) Graduate Student Fellowship (US$5000)

2016: Mineralogical Society student travel bursary (£375)

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

CONFERENCES

Conference papers:

Guice, G. L., McDonald, I., Hughes, H. S. R., MacDonald, J. M., Goodenough, K. M., Faithfull, J. W. (2018) Ultramafic-mafic complexes in the Lewisian Gneiss Complex: a record of petrogenetically distinct phases of Archean magmatism. Granulites and granulites, Ullapool (UK).

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).

Wainwright, A.N., Debaille, V., Pourkhorsand, H., Zircone, S.A., Mole, D.R., Barnes, S.J., Maas, R., Guice, G.L. (2018). Tracing Early Earth Differentiation with ^{142}Nd. Goldschmidt, Boston (USA).

Guice, G. L., McDonald, I., Hughes, H. S. R., Schlatter, D. M. (2017) A lithogeochemical assessment of element mobility in Archean cratons: implications for Nb-Ta anomalies and PGE mobility. Goldschmidt, Paris.

Guice, G. L., Törmänen, T., Johanson, B., Lahaye, Y. (2016) Offset-type PGE mineralisation in the Sotkavaara Intrusion, northern Finland: an association with zones of low-Cr clinopyroxenite. MDSG Meeting, Bristol (UK).

Guice, G. L., McDonald, I., Hughes, H. S. R., Anhaeusser, C. R. (2016) Using PGE to characterise ultramafic-mafic complexes in Archean cratons. Highly Siderophile Element geochemistry, Durham (UK).

Guice, G. L., Hughes, H. S. R., McDonald, I. (2016) Geochemical distinctions between ultramafic-mafic bodies in the Lewisian Complex. North Atlantic Craton conference, Edinburgh (UK).

Other conferences attended:

2020*: Geological Society of America regional meeting (northeast/southeast combined), Reston, VA.
*cancelled due to the COVID-19 outbreak.

2018: Earth dynamics and the development of plate tectonics. Royal Society, London (UK).

2017: Bryan Lovell Meeting, Mining for the Future. Geological Society, London (UK).

SPECIALIST TRAINING, OUTREACH AND OTHER QUALIFICATIONS

Specialist courses attended:

2018: 3-day training course for new solution-based ICP-OES and ICP-MS systems at Cardiff University.

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

2016: Two-day Leapfrog software course at SRK consulting, Cardiff (UK).

2015: Five-day Datamine course and one-day Micromine course.

Outreach:

2020*: The Expert is in - Hunting for 3 billion-year-old rocks. *Cancelled due to COVID-19 outbreak.

2015-2019: STEM (Science, Technology, Engineering and Math) ambassador, South Wales (UK).

Specialist software and other relevant qualifications:

2019: Expertise using iPad and associated Fieldmove software, which are utilized for geological mapping.

2016-2019: Expertise using toughbook and associated Arc-GIS/sigma mobile geological mapping software.

2013-2020: Arc-GIS, R, CorelDraw and Inkscape.

2015: First-aid certificate (UK)

2014: UK driving license.

REFERENCES

Dr Michael Ackerson (postdoctoral advisor), NMNH, Smithsonian Institution (AckersonM@si.edu)

Dr Iain McDonald (PhD supervisor), Cardiff University (McDonaldI1@cardiff.ac.uk) .

Dr Tuomo Törmänen (MSc project supervisor), Geological Survey of Finland (Tuomo.tormanen@gtk.fi).