

Morgan Williams

I am a Postdoctoral Fellow within the CSIRO Mineral Resources group, and recently submitted my PhD thesis in geochemistry at the Australian National University. I'm applying data science to large geochemical datasets to construct probabilistic models of variability in geological processes through time and space.

Research and Education

- 2018–Present **Postdoctoral Fellow, Geoscience Analytics**, *CSIRO Mineral Resources*, Perth, WA.
- 2014–2018 **PhD Geochemistry**, ANU, Canberra, ACT.
(Subm.) **Thesis**: "Tracing Fluids from Seafloor to Deep Subduction Environments: An In-situ Geochemical Investigation of Fluid-Mobile Elements in Oceanic Crust"
Supervisors: M. Kendrick, D. Rubatto, T. Ireland, J. Hermann, P. Holden and C. Magee
- 2016–2017 **Science Party Member**, *IODP Expedition 357: Atlantis Massif*.
Igenous Petrologist, Onshore Science Party (MARUM, Bremen, Germany)
Post-Cruise Meeting, Texas A&M University (Texas A&M, College Station TX, USA)
- 2010–2013 **B. Global and Ocean Sciences (Honours 1A)**, ANU, Canberra, ACT.
Thesis: Exhumation of a Crust-Mantle Contact: The Geochemical Record
Supervisor: D. Rubatto

Publications

- S. Rouméjon, **M. Williams**, and G.L. Früh-Green (2018.). In-situ oxygen isotope analyses in serpentine minerals: Constraints on serpentinization during tectonic exhumation at slow- and ultraslow-spreading ridges. *Lithos* 323 p.156-173. doi: 10.1016/j.lithos.2018.09.021
- J. Noël, M. Godard, E. Olliot, I. Martinez, **M. Williams**, F. Boudier, O. Rodriguez, C. Chaduteau, S. Escario and P. Gouze (2018). Evidence of polygenetic carbon trapping in the Oman Ophiolite: Petro-structural, geochemical, and carbon and oxygen isotope study of the Wadi Dima harzburgite-hosted carbonates (Wadi Tayin massif, Sultanate of Oman). *Lithos* 323 p.218-237. doi: 10.1016/j.lithos.2018.08.020
- G.L. Früh-Green, B.N Orcutt, S. Rouméjon, M.D. Lilley, Y. Morono, S.L. Green, C. Cotterill, and the IODP Expedition 357 Scientists (2018). Magmatism, serpentinization and life: Insights through drilling the Atlantis Massif (IODP Expedition 357). *Lithos* 323 p.137-155. doi: 10.1016/j.lithos.2018.09.012
- Rouméjon S., Früh-Green G. L., Orcutt B. N. et al. (2018). Alteration Heterogeneities in Peridotites Exhumed on the Southern Wall of the Atlantis Massif (IODP Expedition 357). *J. Petrology* 59:7 p.1329-1358. doi: 10.1093/petrology/egy065

Conference Presentations

- 2019 **M. Williams**, S. Barnes, and J. Klump. Leveraging Global Geochemical Databases for Multivariate Discrimination. Melt Evolution in Space and Time. Monash University, Melbourne, Australia.
- 2018 **M. Williams**, J. Klump and S. Barnes. Investigating the Emergence and Geochemical Evolution of Enriched Basaltic Magmas: A Data-Driven Approach. AGU Fall Meeting. Washington DC, USA.
- M. Williams**, J. Klump and S. Barnes. Insight into Geological Processes in Deep Time: Exploratory Multivariate Analysis of Geochemical Datasets. C3DIS. Melbourne, Australia.
- 2017 **M. Williams**, M.A. Kendrick, and D. Rubatto. Hydration of the Atlantis Massif: Halogen, Noble Gas and In-Situ $\delta^{18}\text{O}$ Constraints. AGU Fall Meeting. New Orleans, USA

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2016 **M. Williams**, M.A. Kendrick, D. Rubatto and the IODP Expedition 357 Science Party (2016). Investigating the Geochemistry of Serpentinization in the Atlantis Massif: Preliminary Results of In-Situ $\delta^{18}\text{O}$, Trace Element and Noble Gas Analysis. Serpentine Days. Sète, France.

M. Williams, P. Holden, D. Rubatto, and C. Magee (2016). Boron Isotope Analysis on SHRIMP II. SHRIMP Workshop. Grenada, Spain

M. Williams, D. Rubatto, J. Hermann and P. Holden (2016). Tracing fluids in subducted oceanic crust using in-situ $\delta^{18}\text{O}$ and $\delta^{11}\text{B}$ by SHRIMP. Goldschmidt Conference. Yokohama, Japan

Software

M. Williams (2018). Pyrolite: A set of tools for getting the most from your geochemical data. doi: 10.5281/zenodo.2545106

Research Grants

April 2016 **"Investigating Fluid Evolution during Serpentinization of the Atlantis Massif"**, Australia-New Zealand IODP Consortium (ANZIC), \$39,900.

M. Williams, M.A. Kendrick and D. Rubatto

Other Relevant Experience

07/2015–10/2017 **Scanning Electron Microscopy Lab Manager**, RSES, ANU.

2012–2016 **Demonstrating Experience**, RSES, ANU.

Geology, Geochemistry, Planetary Science, Economic Geology

Skills and Experience

Key Isotope Geochemistry, Metamorphic Petrology

Programming Python; Experience with Git, SQL, C++, Julia, R, HTML/CSS, Javascript

SIMS Stable Isotopes (B, O), U-Pb Geochronology using SHRIMP

LA-ICP-MS Trace Element Analysis

Noble Gases Analysis of Noble Gases, Halogens by Noble Gas Mass Spectrometry