

Sheree Armistead

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I am a geoscientist interested in the links between mineral systems and plate tectonics, and the cyclical and secular changes of these through time. I am particularly interested in isotope geochemistry and using computational techniques to analyse large datasets both temporally and spatially. Using these skills, I am keen to unravel the geological evolution of different regions, piece together past supercontinents and improve our understanding of how mineral systems form.

🏛️ Employment and Education

Sep 2019 – **Postdoctoral Research Fellow**

current Geological Survey of Canada and Laurentian University 📍 Ottawa, Canada/
(Adjunct Researcher at IMAS, The University of Tasmania: March 2021 – current) Hobart, Australia

- Collaborative project with the Geological Survey of Canada, Metal Earth program at Laurentian University, the University of Saskatchewan and Geoscience Australia
- Using a large global database of Pb isotopes from mineral deposits and applying various computational techniques to understand the implications for regional and global tectonics, and critical mineral formation
- Focusing on the Superior Province in Canada, using Pb and Nd isotopes to understand the evolution of VMS and related deposits

Oct 2015 – **PhD Candidate**

Sep 2019 The University of Adelaide 📍 Adelaide, Australia

- Primarily used Isotope geochemistry, structural geology and statistical/computational techniques to construct models for the tectonic evolution of Madagascar and India during the Precambrian
- Integrating large datasets of isotopic data to develop plate reconstructions for Madagascar from the Archean to early Cambrian
- Thesis: Tectonic evolution of Madagascar over three billion years of Earth's history

Jan 2014 – **Geochronologist & Mineral Systems Geologist**

Sep 2015 **Graduate Geoscientist**
Geoscience Australia, Australian Government 📍 Canberra, Australia

- I worked primarily on the Tasmanides of eastern Australia and applied a range of geochemical techniques to improve the understanding of mineral potential in this region

Dec 2012 – **Undergraduate Geologist (summer vacation work)**

Feb 2013 BHP Billiton Mitsubishi Alliance 📍 Brisbane, Australia

Jan 2010 – **Bachelor of Science, Honours (first class)**

Dec 2013 Monash University 📍 Melbourne, Australia
Thesis: The structural evolution of the North Portia Cu-Au-Mo deposit, Curnamona Province, South Australia

📊 Technical Skills

Geochemistry: I have extensive experience analysing various rocks and minerals for U–Pb, Pb–Pb, Lu–Hf, O, Rb–Sr, S and major/trace element geochemistry. I am an experienced user of rock preparation facilities, SEM, LA-ICP-MS, LA-QQQ-ICP-MS, SHRIMP and more.

Structural geology: I am experienced in structural geology using observations from field work, drillcore data and geophysics. I have used these data to develop 3D models, with a specific focus on mineral systems.

Computational: I am an advanced user of R, ArcGIS and GPlates, with experience in 3D modelling software. I am proficient at using data science approaches to manage, analyse and interpret large datasets and generate plate reconstruction models.

Field work: I have extensive field experience including geophysical instrument deployment, mapping, structural geology, drillcore logging, mining/exploration field sites and sample collection. I have worked in remote regions of Australia, Madagascar and India.

- Armistead, S.E.**, Collins, A.S., Schmitt, R.S., Costa, R.L., De Waele, B., Razakamanana, T., Payne, J.L. and Foden, J.D., 2021. [Proterozoic basin evolution and tectonic geography of Madagascar: implications for an East Africa connection during the Paleoproterozoic.](#) *Tectonics*. ESSOAr Preprint doi: doi.org/10.1002/essoar.10503959.1
- Merdith, A.S., Williams, S.E., Collins, A.S., Tetley, M.G., Mulder, J.A., Blades, M.L., Young, A., **Armistead, S.E.**, Cannon, J., Zahirovic, S. and Muller, D.R., 2021. [Extending full-plate tectonic models into deep time: Linking the Neoproterozoic and the Phanerozoic.](#) *Earth-Science Reviews*.
- Costa, R.L., Schmitt, R.S., Collins, A., **Armistead, S.E.**, Gomez, I.V., Archibald, D. and Razakamanana, T., 2021. [Tectonic evolution of an Early Cryogenian late-magmatic basin in central Madagascar.](#) *Journal of African Earth Sciences*. EarthArXiv Preprint doi: <https://doi.org/10.31223/X59S38>
- Armistead, S.E.**, Collins, A.S., Buckman, S. and *Atkins, R., 2020. [Age and geochemistry of the Boucaut Volcanics in the Neoproterozoic Adelaide Rift Complex, South Australia.](#) *Australian Journal of Earth Sciences*. EarthArXiv Preprint doi: doi.org/10.31223/osf.io/mgpf4
- Armistead, S.E.**, Collins, A.S., Redaa, A., Gilbert, S., Jepson, G., Gillespie, J., Blades, M.L., Foden, J.D. and Razakamanana, T., 2020. [Structural evolution and medium-temperature thermochronology of central Madagascar: implications for Gondwana amalgamation.](#) *Journal of the Geological Society*.
- Armistead, S.E.**, Collins, A.S., Merdith, A.S., Payne, J.L., Cox, G.M., Foden, J.D., Razakamanana, T. and De Waele, B. 2019. [Evolving marginal terranes during Neoproterozoic supercontinent reorganisation: constraints from the Bemarivo Belt in northern Madagascar.](#) *Tectonics*.
- Armistead, S.E.**, Betts, P.G., Ailleres, L., Armit, R.J. and Williams, H.A., 2018. [Cu-Au mineralisation in the Curnamona Province, South Australia: A hybrid stratiform genetic model for Mesoproterozoic IOCG systems in Australia.](#) *Ore Geology Reviews*.
- Armistead, S.E.**, Collins, A.S., Payne, J.L., Foden, J.D., De Waele, B., Shaji, E. and Santosh, M., 2017. [A re-evaluation of the Kumta Suture in western peninsular India and its extension into Madagascar.](#) *Journal of Asian Earth Sciences*.
- Merdith, A.S., Collins, A.S., Williams, S.E., Pisarevsky, S., Foden, J.F., Archibald, D., Blades, M.L., Alessio, B.L., **Armistead, S.**, Plavsá, D., Clark, C. and Muller, D.R., 2017. [A full-plate global reconstruction of the Neoproterozoic.](#) *Gondwana Research*.
- Armistead, S.E.**, Skirrow, R.G., Fraser, G.L., Huston, D.L., Champion, D.C. and Norman, M.D., 2017. Gold and intrusion-related Mo-W mineral systems in the southern Thomson Orogen, New South Wales. *Geoscience Australia Record*, Record 2017/05.
- Waltenberg, K., Blevin, P.L., Bull, K.F., Cronin, D.E. and **Armistead, S.E.**, 2016. New SHRIMP U-Pb zircon ages from the Lachlan Orogen and the New England Orogen, New South Wales. *Geoscience Australia Record*, Record 2016/28.
- Armistead, S.E.** and Fraser, G.L., 2015. New SHRIMP U-Pb zircon ages from the Cuttaburra and F1 prospects, southern Thomson Orogen, New South Wales. *Geoscience Australia Record*, Record 2015/20.
- Roach, I.C., **Armistead, S.E.**, Brodie, R.C., Clarke, J.D.A., Doublier, M.P., Main, P.T., McPherson, A.A. and Skirrow, R.G., 2015. The Southern Thomson Orogen VTEMplus AEM Survey: Using airborne electromagnetics as an UNCOVER application. *Geoscience Australia Record*, Record 2015/29.

Invited/Keynote Talks

- 2021 Secular changes in Earth's evolution revealed by Pb isotopes. *IGCP 648 Virtual Seminar Series*.
- 2021 Three billion years of tectonic evolution in Madagascar: implications for Earth's supercontinent cycles. *Geological Society of Australia, Tasmanian Division Meeting, Hobart, Australia*.
- 2019 Tectonic geography of Madagascar during the Precambrian. *IGCP 648 Symposium, Toliara, Madagascar*. [keynote talk]
- 2018 Invited pannelist 'Challenges and Solutions', Women in Earth and Environmental Sciences Australiasia (WOMEESA) workshop, *Australian Geoscience Council Convention, Adelaide, Australia*.
- 2018 Deciphering key events of Neoproterozoic orogenesis in Madagascar: insights from structure and thermochronology, *Petrology and Geochemistry Seminar, Australian National University (ANU), Canberra, Australia*.
- 2016 Multi-dimensional scaling of detrital zircon data to constrain provenance and tectonics in Madagascar and India, *EarthByte Seminars, The University of Sydney, Australia*.

- 2021 Using Pb isotopes to unravel the evolution of ore forming regions during the Archean. *Metal Earth partner advisory meeting October 2021*. [oral]
- 2020 Pb isotope variability in the Archean and implications for early Earth geodynamics. *International Archean Symposium (accepted, but conference postponed)*. [oral]
- 2019 The cyclic nature of tectonics and metallogeny from Pb isotopes. *Metal Earth partner advisory meeting October 2019*. [oral]
- 2018 The evolution of northern Madagascar during the Neoproterozoic: implications for Rodinia and Gondwana plate reconstructions. *IGCP 648 Symposium, Yichang, China*. [oral]
- 2018 Tectonic evolution of the Neoproterozoic Bemarivo Belt in northern Madagascar: from Rodinia to Gondwana, *Australian Geoscience Council Convention, Adelaide, Australia*. [oral]
- 2018 Deciphering key events of Neoproterozoic orogenesis in Madagascar: insights from structure and multiple thermochronometers, *European Geosciences Union General Assembly, Vienna, Austria*. [poster]
- 2018 Detrital provenance of the Itremo Group in central Madagascar using trace elements and Hf isotopes in zircon, *European Geoscience Union General Assembly, Vienna, Austria*. [poster]
- 2017 The structural evolution of central Madagascar: a tale of two orogenies, *Puzzling out Gondwana, Bangkok, Thailand*. [oral]
- 2017 Suturing Madagascar and India: New insights from Lu-Hf data and multi-dimensional scaling of U-Pb detrital zircon data, *Rodinia Conference, Townsville, Australia*. [oral]
- 2017 A structural transect through central Madagascar – constraining the Neoproterozoic tectonic evolution, *Rodinia Conference, Townsville, Australia*. [poster]
- 2016 A re-evaluation of the Kumta Suture in southwest India and its extension into Madagascar, *The 35th International Geological Congress, Cape Town, South Africa*. [oral]
- 2016 A re-evaluation of the Kumta Suture in southwest India and its extension into Madagascar, *Australian Earth Sciences Convention, Adelaide, Australia*. [poster]
- 2015 Structural evolution of the North Portia Cu-Au-Mo deposit, Curnamona Province, South Australia, *South Australian Exploration and Mining Conference, Adelaide, Australia*. [poster]
- 2015 Structural evolution of the North Portia Cu-Au-Mo deposit, Curnamona Province, South Australia, *Specialist Group in Tectonics and Structural Geology (SGTSG), Caloundra, Australia*. [poster]
- 2015 Gold- and Tungsten-Molybdenum-bearing mineral systems of the southern Thomson Orogen, New South Wales, Australia, *Society of Economic Geologists (SEG) Conference, Hobart, Australia*. [poster]
- 2013 Structural evolution and controls on the North Portia Cu-Au-Mo deposit, Curnamona Province, South Australia, *Victorian Universities Earth and Environmental Sciences Conference*. [oral]
- 2013 Geophysical applications for IOCG exploration over the Benagerie Ridge Magnetic Complex, Curnamona Province, South Australia, *Australia Society of Exploration Geophysicists (ASEG) Victoria branch student conference*. [oral]

Teaching and Advising

- 2020 **Advisor for student employee at the Geological Survey of Canada**
 - Project compiling age data for the Ore Deposits Isotope Database in collaboration with Sally Pehrsson (Geological Survey of Canada) and Bruce Eglington (University of Saskatchewan)
- 2016 – **Teaching Assistant, The University of Adelaide**
- 2019
 - Honours level: New Zealand Field Geoscience
 - Third year: Flinders Ranges Field Geoscience
 - Second year: Geochemistry II
 - First year: Earth's Interior, Geology for engineers, Earth Systems field trip
- 2017 **Advisor for BSc. (advanced) undergraduate project** (co-advisor with Prof. Alan Collins)
 - Flinders Ranges geochronology project: teaching second year undergraduate student how to prepare zircon samples for U–Pb analysis, using SEM and LA-ICP-MS instrumentation, data processing and interpretation, and preparation of data to present at a student conference.

Awards, Scholarships and Grants

- Dean's Commendation for Doctoral Thesis Excellence, 2019
- International Geoscience Programme (IGCP) Australian National committee travel grant to attend the European Geosciences Union General Assembly, Vienna, Austria, 2018
- IGCP Australian National committee travel grant to attend the Rodinia Conference, Townsville, 2017
- IGCP 648 project travel grant to present at the Rodinia Conference, Townsville, 2017
- IGCP Australian National committee travel grant to attend IGCP 648 Rodinia, Townsville, 2017
- IGCP 648 project to present at the 35th International Geological Congress in Cape Town, South Africa, 2016
- IGCP Australian National committee travel grant to attend the 35th IGC in Cape Town, South Africa, 2016
- Geological Society of Australia (SA) travel grant to attend SGTSG conference, Caloundra, 2015
- Best Oral Presentation in the category Economic Geology, Geodynamics and Stratigraphy, VUEESC, 2013
- First Prize Oral Presentation ASEG Victoria branch student conference, 2013
- BHP Billiton Mitsubishi Alliance Tertiary Scholarship, 2012 – 2013
- Monash Residential Services Residential Advisor Scholarship, 2012
- Monash Residential Services Undergraduate Equity Bursary, 2012
- Monash University Support Bursary, 2012

Workshops, Short Courses and Field Symposia

- Critical Minerals Mapping Initiative workshop in Ottawa with key members of the national geological surveys of Canada (Geological Survey of Canada), Australia (Geoscience Australia) and the United States (United States Geological Survey), 2019
- IGCP 648 Field Symposium in Madagascar (event organiser), 2019
- IGCP 648 Field Symposium in South China – from Rodinia to Pangea, 2018
- IGCP 648 Isotope Database workshop – Rodinia Conference, 2017
- Pre-EGU 2018 field trip with Professor Bernhard Grasemann – Deformation processes in the Lower crust, Bohemian Massif, Austria, 2018
- Orogenic Gold Deposits: Geology, Geochemistry, Exploration Criteria, and Global Patterns – Australian Earth Sciences Convention workshop with Dr Richard J. Goldfarb, 2016
- IGCP 648 Isotope Database workshop – 2016 International Geological Congress, 2016
- Professional development short course series: influencing, negotiation, presentation skills, 2014
- Honours short course: Exploration Field Skills, University of Tasmania, 2013
- Honours short course: Igneous geodynamics and magmatic ore deposits, University of Melbourne, 2013
- Honours short course: Geology from Geophysics, Monash University, 2013
- Honours short course: Advanced Structural Mapping, Bermagui, 2013

Professional Service

Committees/events organising

2021 – 22	GAC-MAC 2022 organising committee
2020 – current	Project co-secretary IGCP 648 Supercontinent Cycles & Global Geodynamics
2020	Developed and organised 15 week virtual seminar series for the IGCP 648 Supercontinents & Geodynamics group, which attracted ~650 participants from ~50 countries around the world
2019	IGCP 648 field symposium to Madagascar, field trip and conference co-organiser
2018 – 19	Organised events for International Women's Day at the University of Adelaide, including guest panel, group discussions. 2019 event with WOMEESEA (Women in Earth and Environmental Sciences Australasia)
2017 – 18	Developed and organised Geological Society of Australia student mentoring night. Involved inviting professionals from industry, government and academia to participate in speed mentoring with students
2016 – 19	Committee member for the Geological Society of Australia South Australia division

- 2016 – 19 Social Media Manager (Twitter and Facebook) for the Geological Society of Australia social media pages
- 2017 GESSA (Geological Society of Australia Earth Sciences Student Symposium, South Australia) organising committee
- 2016 Australian Earth Sciences Convention, Adelaide – organising committee and social media manager
- 2012 – 13 Australasian Institute of Mining and Metallurgy (AusIMM), Student Chapter committee member

Editorial

- 2017 Guest editor, Geoscience Frontiers East Africa special issue
- 2016 – current Reviewer for several journals including: Geology, Journal of the Geological Society, Lithos, Gondwana Research, Minerals, Canadian Journal of Earth Sciences, Geological Magazine.

Geoscience Working Groups

- 2015 – current IGCP 648 Supercontinent Cycles and Global Geodynamics. Member of international group contributing to research on supercontinent cycles, participating in conferences, contributing to workshops on global database development for geological and geochronological data
- 2015 – current IGCP 638 Gondwana Map. Member of international group contributing to research on Gondwana. Research visit to Rio de Janeiro, Brazil to contribute to Gondwana Map development. Currently collaborating with researchers from Brazil (IGCP 628 project leader) on tectonics of Madagascar with manuscript in preparation

Science Communication

- 2015 – current Contributions to science blogs, e.g. RiAUS, Traveling Geologist, Rock Head Sciences
 - [Gondwanan tectonics in India with Sheree Armistead](#)
 - [Arkaroola Field Camp, South Australia with Sheree Armistead](#)
 - [A day in the GeoLife Series: Sheree Armistead](#)

Outreach

- 2014 – current
 - Assisting with school group visits to the University of Adelaide
 - University of Adelaide Open Day, facilitating Earth Science demonstrations
 - Geoscience Australia Open Day, communicating Earth Science research to the community

Other Experience, Certificates and Qualifications

- Certificate IV in Frontline Management
- 4WD certificate
- Senior first aid
- Mental Health First Aid
- University of Adelaide Fire Warden 2016–2019
- Monash University Residential Advisor 2012
- Former Country Fire Authority Volunteer Firefighter (training and certificates in a range of firefighting skills)