

CURRICULUM VITAE

Maxwell Alexander Lechte

Date of birth: 26th March 1991

Nationality: Australian

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EDUCATION

2015-2019 PhD, Earth Sciences, University of Melbourne (conferred 3rd April 2019)

2012-2014 MSc (Distinction), Earth Sciences, University of Melbourne

2009-2011 BSc, Geology, University of Melbourne

PROFESSIONAL EXPERIENCE

September 2020–present: Postdoctoral Researcher

Department of Earth and Planetary Sciences, McGill University

Advisor: Prof. Galen Halverson. Funded by the Moore-Simons Project on the Origin of the Eukaryotic Cell (Simons Foundation)

August 2019–August 2020: Postdoctoral Fellow

Department of Earth and Planetary Sciences, McGill University

Advisor: Prof. Galen Halverson. Funded by the Programme de Bourses d'Excellence pour Étudiants Étrangers (Fonds de Recherche du Québec – Nature et Technologies)

Winter 2019: Precambrian Geology Research Assistant

School of Earth Sciences, University of Melbourne

Summer 2017: Visiting Researcher

Department of Geology and Geophysics, Yale University

2013–2018: Teaching Assistant

School of Earth Sciences, University of Melbourne

Courses taught:

Geology for Engineers (2016)

Introduction to Adobe Illustrator Workshop (2016)

Teaching assistant:

Sedimentary Geology (2015-2018)

Understanding Planet Earth (2015-2018)

Introduction to Life, Earth & the Universe (2015-2016)

Dangerous Earth (2016)

Field trip demonstrator:

Geology of Southeast Australia (Otways, VIC; 2013-2017)

Tectonics & Geodynamics (Cape Conran, VIC; 2018)

Sedimentary Geology (Black Rock, VIC; 2017-2018)

Understanding Planet Earth (Phillip Island, VIC; 2015-2018)

Field Mapping & Sedimentary Geology (Buchan, VIC; 2017)

Advanced Field Geology (Flinders Ranges, SA; 2013-2014)

HONOURS, SCHOLARSHIPS AND AWARDS

- 2019 Postdoctoral Merit Scholarship for Foreign Students / Programme de Bourses d'Excellence pour Étudiants Étrangers (Fonds de recherche du Québec – Nature et technologies)
- 2018 Albert Shimmings Award (Faculty of Science, Uni. Melb.)
- 2018 George Lansell Memorial Scholarship, Melbourne School of Engineering
- 2017 Research Training Program Scholarship (Australian Federal Government)
- 2016 International Geological Congress GeoHost Award
- 2015 Australian Postgraduate Award (Australian Federal Government)
- 2015 Dean's Honour List (Faculty of Science, Uni. Melb.)
- 2014 P.W. Crohn Scholarship (School of Earth Sciences, Uni. Melb.)
- 2014 P.J. Adams Research Award (School of Earth Sciences, Uni. Melb.)
- 2013 VUEESC Sedimentology & Environmental Sciences Prize
- 2012 C.M. Tattam Scholarship (School of Earth Sciences, Uni. Melb.)

RESEARCH GRANTS

- 2020 Moore-Simons Project on the Origin of the Eukaryotic Cell Research Grant (Simons Foundation)
- 2017 Postgraduate Research Grant (International Association of Sedimentologists)
- 2016 Science Abroad Travel Grant (Faculty of Science, Uni. Melb.)
- 2016 Postgraduate Research Award (Geological Society of Australia Victoria Division)

PUBLICATIONS

Peer-reviewed articles († co-lead authorship):

- 2022 Wang, C.L.†, **Lechte, M.A.**†, Reinhard, C.T., Asael, D., Cole, D.B., Halverson, G.P., Porter, S.M., Galili, N., Halevy, I., Rainbird, R.H., Lyons, T.W., & Planavsky, N.J. Strong evidence for a weakly oxygenated ocean–atmosphere system during the Proterozoic. *Proceedings of the National Academy of Sciences USA*. (In press)
- 2022 Ma, J., Shi, X., **Lechte, M.**, Zhou, X., Wang, Z., Huang, K., Rudmin, M. & Tang, D. Mesoproterozoic seafloor authigenic glauconite-berthierine: Indicator of enhanced reverse weathering on early Earth. *American Mineralogist*, 107(1), doi: 10.2138/am-2021-7904.
- 2021 Hood, A.V.S., Penman, D.E., **Lechte, M.A.**, Wallace, M.W., Giddings, J.A. & Planavsky, N.J. Neoproterozoic syn-glacial carbonate precipitation and implications for a snowball Earth. *Geobiology*, doi: 10.1111/gbi.12470
- 2021 Wei B., Tang D., Shi X., **Lechte, M.**, Zhou L., Zhou X. & Song H. A pulsed oxygenation in terminal Paleoproterozoic ocean: Evidence from the transition between the Chuanlinggou and Tuanshanzi formations, North China. *Geochemistry, Geophysics, Geosystems*, 22(5), doi: p.e2020GC009612.
- 2021 Maloney, K.M., Halverson, G.P., Schiffbauer, J.D., Xiao, S., Gibson, T.M., **Lechte, M.A.**, Cumming, V.M., Millikin, A.E.G., Murphy, J.G., Wallace, M.W., Selby, D. & Laflamme, M. New multicellular marine macroalgae from the early Tonian of northwestern Canada. *Geology*, doi: 10.1130/G48508.1.
- 2020 Fang, H., Tang, D., Shi, X., **Lechte, M.**, Shang, M., Zhou, X. & Yu, W. Manganese-rich deposits in the Mesoproterozoic Gaoyuzhuang Formation, North China platform:

- Genesis and paleoenvironmental implications. *Palaeogeography, Palaeoclimatology, Palaeoecology*, doi: 10.1016/j.palaeo.2020.109966.
- 2020 O'Connell, B., Wallace, M., Hood, A.v.S., **Lechte, M.** & Planavsky, N. Iron-rich carbonate tidal deposits, Angepena Formation, South Australia: A redox-stratified Cryogenian basin. *Precambrian Research*, 342, 105668, doi: 10.1016/j.precamres.2020.105668.
- 2020 Tang, D., Ma, J., Shi, X., **Lechte, M.** & Zhou, X. The formation of marine red beds and iron cycling on the Mesoproterozoic North China Platform. *American Mineralogist*, doi: 10.2138/am-2020-7406.
- 2019 **Lechte, M.A.**, Wallace, M.W., van Smeerdijk Hood, A., Li, W., Jiang, G., Halverson, G.P., Asael, D., McColl, S.L. & Planavsky, N.J. Subglacial meltwater supported oxygenated marine habitats during Snowball Earth. *Proceedings of the National Academy of Sciences USA*, doi: 10.1073/pnas.1909165116.
- 2019 Ling, H.-F., Wei, G., Shields, G., Chen, T., **Lechte, M.**, Chen, X., Qiu, C., Lei, H. & Zhu M. Long-term evolution of terrestrial inputs from the Ediacaran to early Cambrian: clues from Nd isotopes in shallow-marine carbonates, South China. *Palaeogeography, Palaeoclimatology, Palaeoecology* 535, doi: 10.1016/j.palaeo.2019.109367.
- 2018 **Lechte, M.A.**, Wallace, M.W., Hood, A.v.S. & Planavsky, N. Cryogenian iron formations in the glaciogenic Kingston Peak Formation, California. *Precambrian Research* 310, doi: 10.1016/j.precamres.2018.04.003.
- 2018 Busigny, V., Planavsky, N.J., Goldbaum, E., **Lechte, M.A.**, Feng, L. & Lyons, T.W. Origin of the Neoproterozoic Fulu iron formation, South China: Insights from iron isotopes and rare earth element patterns. *Geochimica et Cosmochimica Acta* 242, doi: 10.1016/j.gca.2018.09.006.
- 2018 **Lechte, M.A.**, Wallace, M.W. & Hoffmann, K.H. Glacio-marine iron formation deposition in a c. 700 Ma glaciated margin: insights from the Chuos Formation, Namibia. *Geological Society, London, Special Publications* SP475-2, doi: 10.1144/SP475.2.
- 2016 **Lechte, M.** & Wallace, M. Sub-ice shelf ironstone deposition during the Neoproterozoic Sturtian glaciation. *Geology* 44(11), p.891-894, doi: 10.1130/G38495.1.
- 2015 **Lechte, M.A.** & Wallace, M.W. Sedimentary and tectonic history of the Holowilena Ironstone, a Neoproterozoic iron formation in South Australia. *Sedimentary Geology* 329, doi: 10.1016/j.sedgeo.2015.09.014.

PRESENTATIONS

Invited lectures, colloquia and seminars

- 2021 Cryogenian Seminar Series, Subcommittee on Cryogenian Stratigraphy
 2021 Department of Earth and Planetary Sciences, McGill University, Montreal, Canada
 2020 *Programme Séminaires Géotop*, Centre de recherche sur la dynamique du système Terre, Université du Québec à Montréal, Montréal, Canada

- 2020 *Distinguished Speaker Program*, Department of Geological Science and Geological Engineering, Queen's University, Kingston, Canada
- 2019 School of Earth Sciences and Engineering, Nanjing University, Nanjing, China
- 2019 Department of Earth Science, University of California, Santa Barbara, USA
- 2017 Geological Society of Australia, Victoria Division, Melbourne, Australia
- 2017 Department of Geology & Geophysics, Yale University, USA

Selected abstracts presented (*student advisee):

- 2021 **Lechte, M.**, Whelan, M.*, Riedman, L.A., Porter, S., Halverson, G. & dos Santos Jr, A. Geochemical insights into the redox conditions of early eukaryote habitats. *Moore-Simons Project on the Origin of the Eukaryotic Cell Annual Meeting* (Online).
- 2021 **Lechte, M.**, Halverson, G., Wallace, M., Gibson, T., Hood, A., Wang., C.L., Planavsky, N., Milikin, A., Maloney, K. & Lamothe, K. Ironstones of Yukon: insights into marine iron cycling in the early Neoproterozoic. *Northeast Geobiology Symposium*, Dartmouth College (Online).
- 2020 **Lechte, M.**, Halverson, G., Wallace, M., Gibson, T., Hood, A., Wang., C.L., Planavsky, N., Milikin, A., Maloney, K. & Lamothe, K. Ironstones of the Katherine Group, Yukon: marine iron cycling in the Tonian Period. *GSA Online*.
- 2019 **Lechte, M.**, Halverson, G., Wallace, M., Hood, A., Planavsky, N., Gibson, T., Milikin, A., Maloney, K. & Murphy, J. Tonian ironstones of the Katherine Group, Yukon: low oxygen shallow seawater in the early Neoproterozoic. *Geobiology Society Conference*, Banff, Canada.
- 2019 **Lechte, M.**, Halverson, G., Wallace, M., Hood, A., Gibson, T., Milikin, A., Maloney, K. & Murphy, J. Ironstones of the Katherine Group, Yukon: marine iron cycling in the early Neoproterozoic. *GAC-MAC*, Quebec, Canada.
- 2018 **Lechte, M.**, Wallace, M., Hood, A., Planavsky, N., Li, W., Jiang, G., *McColl, S. & Asael, D. Glacial Oxygen Delivery in the Neoproterozoic: Fe Isotope Evidence. *Goldschmidt*, Boston, USA.
- 2017 **Lechte, M.**, Wallace, M. & Hood, A. Did glacial fluids help ventilate the oceans in the Neoproterozoic? Insights from glacially-associated iron formations. *Geobiology Society Conference*, Banff, Alberta, Canada.
- 2017 **Lechte, M.**, Wallace, M. & Hood, A. Neoproterozoic glaciomarine ironstones as geochemical proxies for Cryogenian oceans. *Goldschmidt*, Paris, France.
- 2016 **Lechte, M.A.** & Wallace, M.W. Origin of Neoproterozoic iron formations in Australia and Namibia. *International Geological Congress*, Cape Town, South Africa.
- 2016 **Lechte, M.A.** & Wallace, M.W. A sub-ice shelf setting for Neoproterozoic iron formations within the Sturtian glacial sequence? Insights from Australia and Namibia. *William Smith Meeting: Glaciated Margins, The Sedimentary and Geophysical Archive*, Geological Society of London, United Kingdom.
- 2015 **Lechte, M.A.** & Wallace, M.W. Holowilena Ironstone: A Neoproterozoic iron formation in South Australia. *Victorian Universities Earth and Environmental Sciences Conference*, University of Melbourne, Australia.

RELATED ACTIVITIES AND EXPERIENCE

Reviewer:

Geology; Earth and Planetary Science Letters, *Geochimica et Cosmochimica Acta*; Geobiology; Nature Communications; *Frontiers in Earth Science*; Scientific Reports; Ore Geology Reviews; Environmental Earth Science; *Geochemical Perspectives Letters*; Precambrian Research; Sedimentology; Sedimentary Geology; Marine and Petroleum Geology; Journal of the Geological Society of London; GSA Bulletin; Chemical Geology

Professional societies:

Geobiology Society; Geological Association of Canada; European Association of Geochemistry; International Association of Sedimentologists; Geological Society of Victoria

Short courses and workshops:

2020 *Basin Analysis*, McGill University
2019 *Snowball Earth Workshop*, Yale University
2018 *Cryogenian Subcommission Field Trip* (Flinders Ranges, SA)
2014 *Science Communication*, University of Melbourne
2014 *Advanced Geophysics*, Monash University
2013 *Applied Structural Geology*, University of Western Australia
2013 *Advanced Structural Mapping* (Bermagui, VIC), Monash University
2013 *Mineral Exploration Under Cover* (Arkaroola, SA), Adelaide University
2013 *Coastal Environmental Geomorphology* (Gippsland, VIC), La Trobe University
2013 *Basin Analysis*, University of Melbourne
2013 *Interpretation of Satellite Images*, La Trobe University
2013 *Geoscience Information Systems*, University of Melbourne

Tutoring:

2016-2018 Tutor and Mentor, Murrup Barak Institute for Indigenous Development
2015-2016 Tutor, Trinity College, University of Melbourne

Leadership and volunteering:

2019 Session Co-Chair: Precambrian Sedimentology, GAC-MAC; Quebec, Canada
2015-2018 Science Experience Summer School, Melbourne, Australia
2015-2018 Science Expo, University of Melbourne
2015 Organisation Committee; VUEESC, Melbourne, Australia
2014 Global Leaders in Science Program Leader
2014 Treasurer, Earth Science Postgraduate Group, University of Melbourne

Technical experience:

Geochemical analyses: Electron Microprobe (Cameca SX50) and laser ablation ICP-MS (Agilent 7700X quadrupole ICP-MS) analyses and data reduction and interpretation (rare earth elements) using Iolite Software; X-ray Fluorescence (SPECTRO Xepos Energy Dispersive XRF) and mass spectrometry (Thermo Finnegan Scientific Element XR ICP-MS) analyses. Fe isotope analysis: ion-exchange chromatography and mass spectrometry (Thermo Fisher Scientific Neptune Plus Multi-Collector ICP-MS). Thin-section preparation; transmitted, reflected and scanning electron microscopy; ioGAS Software data analysis.

Field experience:

Lake Mistassini, Cree Nation of Mistissini, Eeyou Istchee (Québec, Canada; 4 weeks); Guangxi Province, China (2 weeks); Ogilvie & Wernecke Mountains, Na-Cho Nyak Dun Territory (Yukon, Canada; 8 weeks); Flinders Ranges, Adnyamathanha & Kuyani Country (South Australia; 16 weeks); Death Valley and Kingston Range Wilderness, Southern Paiute & Timbisha Shoshone Territory (California and Nevada, USA; 4 weeks); Kunene, Namibia (4 weeks); Griqualand, South Africa (2 weeks); Nevada (1 week); Islay, Scotland (1 week)