

BONNIE TEECE

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EDUCATION

PhD in Geology, UNSW Sydney 2018–2022

Organic biosignatures through the geological record: challenges and progress

Techniques used: Gas chromatography-mass spectrometry (GC-MS), Curie-Point Pyrolysis GC-MS, Meta-stable reaction monitoring GC-MS, micro-Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy, petrography.

Master of Research with high distinction, Macquarie University 2016–2017

Lower-middle Cambrian microbialites from South Australia: construction, biofacies and biogeochemistry

Techniques used: GC-MS, FTIR, Raman Spectroscopy, Micro X-ray Fluorescence (XRF), petrography.

Bachelor of Arts and Science, Macquarie University 2012–2016

Majors: English, Russian, Museum Studies

Special Tertiary Entrance Program, Wollongong College 2010

A fully funded university preparation program for disadvantaged students. This program lasts one year, but I completed it in six months due to academic excellence.

PUBLICATIONS

Published

Teece, B.L., Havig, J.R., George, S.C., Hamilton, T.L., Baumgartner, R.J., Hartz, J. and Van Kranendonk, M.J. 'Biogeochemistry of recently fossilised hot spring sinters from Yellowstone, USA'. 23(2) *Astrobiology*

Teece, B. L., Guido, D., Campbell, K.A., Galar, A., Van Kranendonk M.J., and George, S.C. (2022) 'Exceptional molecular preservation in the late Jurassic *Claudia* palaeogeothermal field'. *Organic Geochemistry*, 173, p.104504

Teece, B.L., Metternicht, G., Gnassi, A., Vuolo, F., Belfiore, O.R. (2021), 'Making it happen: An experience of using earth observation-based research outputs for engaging high school students in novel technologies for sustainable agriculture.' *Geographical Education*, 34, (Peer-reviewed Teacher's Journal).

Teece, B.L., Brock, G.A., Paterson, J. R., Skovsted, C.B., Holmer, L.E., George, S.C. (2021), 'Using laser micropyrolysis to assess potential relationships between Cambrian tommotiids and organophosphatic brachiopods'. *Journal of Analytical and Applied Pyrolysis*, 158

Zapata Trujillo, J. C., Syme, A. M., Rowell, K. N., Burns, B. P., Clark, E. S., Gorman, M. N., Jacob, L.S.D., Kapodistrias, P., Kedzaira, D.J., Lempriere, F.A.R., Medcraft, C., O'Sullivan, J.O., Roberston, E.G., Soares, G.G., Steller, L., **Teece, B.L.**, Tremblay, C.D., Sousa-Silva, C., McKemmish, L. K. (2021), 'Computational infrared spectroscopy of 958 phosphorus-bearing molecules.' *Frontiers in Astronomy and Space Sciences*, 8(43)

Teece, B.L., George, S.C., Jacquet, S.M, Agbaje, O.B.A., Brock, G.A. (2020) 'Mars rover techniques and lower-middle Cambrian microbialites from South Australia: Construction, biofacies and biogeochemistry'. *Astrobiology*, 20(5)

Teece, B.L., George, S.C., Djokic, T, Campbell, K.A., Ruff, S.W., Van Kranendonk, M.J. (2020) 'Biomolecules from fossilized hot-spring sinters: Implications for the search for life on Mars'. *Astrobiology*, 20(4)

Accepted

Calera, A., Villodre, J., Campoy, J., Calera, M., Osann, A., Finger, K., **Teece, B.L.**, Metternicht, G. 'Mapping gilgai micro-relief and its impact on dryland agricultural landscapes using time series of NDVI derived from Sentinel-2 imagery' in *Geopedology*, 2nd ed, Springer. *Accepted*.

Metternicht, G., **Teece, B.L.** 'Satellite images: Selfies for environmental sustainability', *Frontiers for Young Minds* (Peer-reviewed Journal for Teenagers).

PRESENTATIONS AND SEMINARS

Invited Talks

Teece, B.L. (2nd November 2022), 'Early Earth biosignatures and the search for life on Mars', Pal(a)eoPERCS, online.

Teece, B.L. (27th October 2022), 'Organic biosignatures in hydrothermal environments on Earth as analogues for Mars and Europa', Australian Centre for Astrobiology Seminar Series, UNSW, Sydney, Australia.

Teece, B.L. (4th August 2022), 'Are we alone?', 'The unknown' themed Powerhouse Lates at the Powerhouse Museum, Sydney, Australia.

Teece, B.L. (6th November 2020), 'Life on Mars?' [U3A](#) presentation, online.

Steller, L. and **Teece, B.L.** (18th August 2020), '[Praxical, Learn by Doing](#)', Astrobiology Society of The Asia Pacific (ASAP), online, dual presenters.

Teece, B.L. (15th November 2018), 'How does the scientific community evaluate candidate Mars Rover landing sites?', Astrobiology themed MAASive lates at the Powerhouse Museum, Sydney, Australia.

Presenting author at a conference

Teece, B. L., Guido, D., Campbell, K.A., Galar, A., Van Kranendonk M.J., and George, S.C. (2022), [Exceptional Molecular Preservation in the Late Jurassic *Claudia* paleo-geothermal field](#), *The Astrobiology Science Conference (AbSciCon)*, 15-20 May, Hybrid Conference, Atlanta, Georgia and Online.

Teece, B. L., Steller, L. H., and Hengst, S. (2022) [Praxical: The Best Way to Learn Science is to do Science](#), *The Astrobiology Science Conference (AbSciCon)*, 15-20 May, Hybrid Conference, Atlanta, Georgia and Online.

Teece, B.L., Pejčić, B, George, S.C., Soares, G.G., Barlow, E.V. Pages, A., Van Kranendonk, M.J. (2021), '[Pushing the limits of detection: investigating the structure of 2.4 Ga overmature Kerogen](#)', *The International Meeting of Organic Geochemists*, 12-17 September, Hybrid Conference.

Teece, B.L., Havig, J.R., George, S.C., Hamilton, T.L., Van Kranendonk, M.J. (2020), '[Organic matter from fossilised hot spring sinter from Yellowstone National Park](#)', *The Australasian Astrobiology Meeting*, 9-11 September, Virtual Conference.

Teece, B.L., Van Kranendonk, M.J., Wang, A. (2020) '[The Australian Centre for Astrobiology](#)', *AbGradE*, Keynote, August 26, Virtual Conference.

Teece, B.L., Duda, J.P., Soares, G.G., Barlow, E.V., Van Kranendonk, M.J. (2019), '[Looking for life: determining biogenicity of ancient organic matter](#)', *The Astrobiology Science Conference*, June 24-28, Seattle, USA.

Teece, B.L., George, S.C., Djokic, T., Campbell, K.A., Ruff, S.W., Van Kranendonk, M.J. (2018) '[Hydrocarbons and hot springs; looking at analogues in the quest for life on Mars](#)', *Australian Organic Geochemistry Conference*, December 3-7, Canberra, Australia.

Teece, B.L., George, S.C., Brock, G.A. (2018), 'Lower-middle Cambrian microbialites from South Australia: architecture, ecology & biogeochemistry', *International Conference on Ediacaran and Cambrian Sciences*, August 12-16, Xi'an, China.

Teece, B.L., George, S.C., Brock, G.A. (2018), 'Using mars rover techniques to investigate early-middle Cambrian microbialites from the Arrowie Basin, South Australia', *The Australasian Astrobiology Meeting*, June 25-26, Rotorua, New Zealand.

Teece, B.L., George, S.C., Brock, G.A. (2018), *Stromatolite construction, biofacies and biomarkers in the Lower Cambrian Hawker Group, Arrowie Basin, South Australia*, *Australian Exploration Geoscience Conference*, Feb 18-21, Sydney, Australia.

Select Co-author presentations (2/15)

Campbell, K.A., **Teece, B.L.**, Guido, D., Van Kranendonk, M.J., Sriaporn, C., Handley, K, Rowe, M, Dobson, M, Hamilton, A. (2022), Biosignature preservation in hot springs on Earth, *LifeSprings workshop*. A workshop with the Japanese Space Agency (JAXA) on a new sample return mission to Mars.

Campbell, K.A., Djokic, T., Ruff, S.W., **Teece, B.L.**, Van Kranendonk, M.J., Farmer, J.D., Sriaporn, C., Handley, K.M., Millan, M., Guido, D.M. (2018), 'Origin and significance of opaline silica deposits at Columbia Hills', *Fourth Landing Site Workshop for the Mars 2020 Rover Mission*, October 16-18, Glendale, USA.

FUNDING, SCHOLARSHIPS AND HONOURS

Total funding secured, \$284,528 AUD (~\$205,000 USD)

Co-proposer Australian Synchrotron Beamline time, \$98,352 AUD (in kind)	2022
Big Questions Institute Fellow , \$15,000 AUD	2022
Fellow of the Higher Education Academy , Advance HE	2022
Co-author on an Australian Centre for Astrobiology outreach funded project, \$3,337 AUD	2021
UNSW Science PhD Writing Scholarship , \$7,500 AUD	2021
Co-author on a U21 Researcher Resilience fund \$6,939 AUD	2020
Co-author on an Inspiring Australia NSW Science Week grant \$5,000 AUD	2020
ECCRC Research Centre Student Grant, \$500 AUD	2020
The sole recipient of the Geological Society of Australia's Endowment Fund , \$5,000 AUD	2019
Short-term research grant German Academic Exchange Service (DAAD) , \$7,000 AUD	2019
Australian Federation of Graduate Women Fellowship Awards , Highly Commended	2019
Equity, Diversity and Inclusion grant , UNSW, \$5,000 AUD	2019
PANGEA Research Centre Student Grant, \$900 AUD	2019
Winner of the PANGEA Research Centre Award for Outstanding Postgraduate Research Presentation	2018
Australian Government Research Training Program Scholarship (RTP) , \$94,000 AUD	2018
Selected as one of 18 students in the inaugural CAPSTAN voyage	2017
Betty Mayne fund , Linnean Society of NSW, \$1000 AUD	2017
Research Training Program Master of Research (RTPMRES) scholarship, \$26,000 AUD	2017
Macquarie University Planetary Centre Student Travel Grant, \$1000 AUD	2016
Macquarie University Research Training Pathway Scholarship, semester 1 and 2, \$8,000 AUD	2016
Academic Excellence in a Tertiary Admittance Programme , Wollongong College	2010

TEACHING, LECTURING, AND COURSE AND ASSESSMENT DESIGN

* indicates courses that I ran, ^ indicates an online course, + indicates courses that I helped develop and write

UNSW, Sydney (2018 – 2022)

BEES2680: Introduction to Communicating Science^+ (T2, 2020 (25 students)*+, T1 2022 (36 students)+)

BEES2741: Introduction to Astrobiology^+ (T2, 2019 (85 students)+)

BEES6800: Communicating Science^(T1 (48 students)+, T3 2019 (40 students), T1 2020 (30 students)+)

BEES6741: Astrobiology: Life in the Universe^(T2, 2018)+ 78 students)

GEOS1111: Fundamentals of Geology (T2, 2018)

Macquarie University, NSW (2016 – 2020)

GEOS2042: Life, The Universe and Everything (S1, 2016-2020) online only in 2020

GEOS226: Introduction to Field Geology (Summer School, 2017)

ANZIC Marine Geoscience Masterclass, International Ocean Discovery Program (IODP) (2019)

Core collection and analysis of Sydney Harbour sediments

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow, NASA's Jet Propulsion Laboratory

2022

I have accepted a position in the Origins & Habitability Laboratory on life detection strategies for the INVADER project, researching life detection strategies for Europa.

Educator and Learning Developer, Powerhouse Museum

2022

I have been contracted by the Powerhouse Museum to design and run a series of space themed STEAM workshops for primary-school aged students. The Powerhouse Museum was established in 1879 and is consistently ranked as one of the top five museums in Australia.

Project Officer, Online Learning and Innovation Community of Practice, UNSW

2021–2022

As Project Officer, I manage a community of practice (CoP) comprising of more than 180 academic and professional staff across all faculties at UNSW. I have created a bibliography of leading practices in education that we are currently preparing for publication. The findings have been presented both to the CoP and UNSW's Scientia Academy. I also developed a [monthly newsletter](#). My work is regularly praised by the office of the Pro Vice-Chancellor of Education & Student Experience, for example, (from 2021's review) "We would also like to give a special shout-out to Bonnie, and acknowledge the significant and valued contributions she has made to the CoP as its Project Officer. We understand that this CoP's leadership/PO combination is unique and we are appreciative of your collective dedication to the topic area, and impressed by your leadership".

Communication and Dissemination Workpackage Leader, COALA

2022–Current

Communication and Dissemination Officer, COALA

2020–2022

COALA is a European Union Horizon 2020 funded project worth €1.8 million. The initiative uses remote sensing data to support more sustainable farming practices in the Murray Darling Basin and I take responsibility for communicating and disseminating that research. I manage regular posts on our [website](#), which has had 15,000 page views in 24 months. Increased use of the website was one of the key objectives of the Communication and Dissemination Plan for this project, a report I co-authored to the EU Horizon committee. I identified that we should have a legacy component which focuses on education and outreach, particularly for regional and remote students, and connected the project with a NSW curriculum developer. I worked with them, and a Professor in the project, to develop curriculum aligned [educational resources](#) for high school students in the stage 5 elective Agricultural Technology. I have just taken over as leader on this workpackage, and oversee all aspects of communication and dissemination.

Co-Founder and Deputy Director, Praxical

2020–2022

I co-founded Praxical with another PhD student because we saw a gap in science education. Many people stop learning science after high school and do not have many ready-made opportunities to engage with scientific data. We have created four virtual workshops which have been completed by >1,000 participants.

Project Manager, UNSW, Sydney

2019

Organising a week long field trip for 20 Mars Rover instrument scientists from NASA and ESA, while concurrently organising and running an astrobiological field camp for regional high school students. The field trip consisted of 16 high school students (years 7-10) meeting the instrument scientists, and then spending two days on a field camp at a remote fossil site in Western Australia. This trip was covered by mass media, including the ABC (see 'Select Media Opportunities' below).

JUSTICE, EQUITY, DIVERSITY AND INCLUSION

Disability Inclusive Communication Training 2022
Run by the Australian Network on Disability, attended training sessions that provided the knowledge, skills, and tools to build disability confidence in the workplace and classroom.

Core Cultural Competency Training 2022
The Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) developed training to create a greater understanding of the history and cultural heritage of Aboriginal and Torres Strait Islander peoples.

Virtual Field Trips 2017–Current
Fieldwork is often required in geoscience which self-selects for able-bodied, financially well-off students with little to no caring responsibilities who can travel to remote locations for weeks at a time. Ongoing work in making virtual field trips (VFTs) for our elective Astrobiology subjects allow us to support students from all backgrounds while still ensuring they develop field-based skills in an equitable way. In our VFT, the median grade was 8/15 and skewed towards science students; I implemented changes that increased the median grade to 13/15 with no skew. I am part of a team of 10 who are developing virtual experiences across faculties, I take part in both the development and academic parts of this project.

Early Career Advisory Panel 2021–Current
I provide advice at a national level to the Geological Society of Australia for how to make the society more inclusive, relevant, diverse, and retain early career geoscientists.

Praxical 2020-Current
[Praxical](#) is an education initiative that I co-founded which creates free virtual data driven workshops for people who would otherwise not access them. See 'Professional Experience' for more information.

Curious Minds Mentoring 2020–Current
I am a mentor in the Curious Minds program which works to ignite girls' passion in science, technology, engineering and mathematics through guiding them through a 6-month long research project.

Sisters who Shine 2020-Current
I do ongoing work with a charity that connects young girls and shows them that women can be scientists too.

Work with Hedland Senior and the Polly Farmer Foundation 2019–Current
Hedland Senior is ranked in the lowest category in Australia for overall educational advantage, an index encompassing socioeconomic factors, access to educational resources, and educational performance. The Polly Farmer Foundation, is an organisation dedicated to supporting the education of Indigenous children. I have worked to deliver incursions and excursions with students from both Hedland Senior and the Polly Farmer Foundation, including field camps with NASA scientists. The impact of this field camp has resulted in cross faculty project based learning courses called [Planet Pilbara](#). These courses were designed by the teachers where arts and science meet to give the students a holistic view of where they live.

Science and Engineering Indigenous Preparatory Program 2020
I was an Instructor for this program which supports Aboriginal and Torres Strait Islander school leavers to enrol and thrive in a STEM degree at UNSW.

ASPIRE Ambassador 2020
ASPIRE is a national programme that encourages and enables students from low socio-economic backgrounds and rural, regional and remote areas to consider, apply for, and successfully participate in tertiary education. As an Aspire Ambassador, I worked with these students to help encourage them to attend university.

GESSS Conference, Equity, Diversity and Inclusion subcommittee 2019
We received a \$5,000 grant to produce the 'Access GESSS' website to increase conference accessibility. This website was developed to provide maps, timetables, abstracts, a chat function, a question function for talks, and information about Indigenous connection to Country. We conducted interviews with Diversity Champions

across all areas of UNSW to research what initiatives would best support our attendees. The conference was made more inclusive by creating the website, having a diverse representation of students and panel members, setting up a safe room, and checking for physical requirements.

Safe Zone Ally Training Workshops 2017, 2018
LGBTQIA+ Ally training at Macquarie University and UNSW.

OTHER SERVICE

Other Education

Created a virtual U21 'Origin of Life' workshop 2021
Created and facilitated 'Exploring Habitable Worlds' education workshops, COSPAR 2021
Created and facilitated STEM day for year 12 Science Extension Class, Narabeen 2020
Development of three virtual science workshops as part of [Praxical](#) (see 'Professional Experience') 2020
Mentor [Brain Stem](#) 2020
Presenting on 'Careers in Science' at Year 9 Careers Day at Wenona High School 2019

Professional Engagement

Reviewer: [Astrobiology, Australian Journal of Earth Sciences](#) 2020–Current

Conference Organisation

Abstract reviewer, AbGradCon 2020,2022
Webmaster and abstract reviewer for the Australasian Astrobiology Meeting (AAM) 2020
Marketing Manager, and Equity, Diversity and Inclusion (EDI) subcommittee member for GESSS 2019

Other Community Engagement

Invited speaker: MAASive lates at the Powerhouse Museum, Sydney, Australia 2022
A founding member of [STROMATOLITES](#), an international ECR Astrobiology networking group 2021-Current
Co-author on a white paper for NASA on Standards of Evidence in Life Detection 2021
[Observations of Mars](#), Powerhouse Museum and Sydney Observatory, Sydney Science trail 2020
Speed Meet a Scientist, Big Science Day, Powerhouse Museum, Sydney, Australia 2019
Part of the Columbia Hills team, Fourth Landing Site Workshop for the Mars 2020 Rover Mission 2018
Assisting at Macquarie University Open Day, Astrobiology and Palaeobiology 2016

FIELDWORK

** indicates field trips I helped organise*

Field work in Yellowstone National Park, USA (2 weeks) 2022
NASA and ESA 2020 rover instrument scientist's field camp, Pilbara Craton, Western Australia* (1 week) 2019
Clean drilling campaign, Pilbara Craton, Western Australia* (1 week) 2019
Ediacaran and Cambrian transition, northern part of South China (1 week) 2018
Field work in 3.5 Ga rocks, Dresser formation, Western Australia, Australia (1 week) 2018
Astrobiology grand tour, Western Australia, Australia (2 weeks) 2018
Hot spring geology field trip, Rotorua, New Zealand (3 days) 2018
Accompanying undergraduates on a field mapping course, Rouchel, Australia (1 week) 2018
Teaching undergraduates on a field mapping course, Lake Keepit, Australia (1 week) 2017
Marine fieldwork aboard the RV Investigator, Freemantle, WA to Hobart, Tas, Australia (2 weeks) 2017
Masters field work in Early-mid Cambrian rocks, Flinders Ranges, South Australia (2 weeks) 2017
Undergraduate field course, North and South Island, New Zealand (2 weeks) 2016
Undergraduate mapping field course, Hill End, Australia (1 week) 2015
Undergraduate marine field course, South Coast NSW, Australia (1 week) 2015
Undergraduate mapping course, Lake Keepit, NSW, Australia (1 week) 2014
Marine science undergraduate field work, Great Barrier Reef, Australia (1.5 weeks) 2014

PROFESSIONAL SOCIETIES

Australasian Universities Geoscience Educators Network (AUGEN)	2020–Current
General member	
Network for Life Detection (NfOLD)	2020–Current
Early Career Council	
Women in Earth and Environmental Sciences in Australasia (WOMEESA)	2020–Current
General member	
Geological Society of Australia (GSA)	2018–Current
Early Career Advisory Panel member	2021–Current
Co-Chair Education and Outreach Steering Committee	2022–Current

SELECT MEDIA OPPORTUNITIES

Career Success and TAFE , media release, TAFE NSW	2022
ABC Drive , radio interview, ABC Illawarra	2022
Salty Extremophiles , Radio interview ABC National Radio	2022
Ancient Pilbara rocks give students a glimpse into life on Earth and Mars , media release, ABC	2020
Astrobiologists put Mars Rover life-detecting equipment to the test , media release, UNSW Newsroom	2020
Inspiring the next generation of scientists in the outback , media release, UNSW	2020
Ancient Signs of Life , UNSW Media, Youtube media release, UNSW Newsroom	2020
Perth Tonight (6pr) , radio interview, Perth Tonight	2020
Einstein A Go-GO , radio interview, RRR	2020
Diffusion Science Radio , podcast	2020
ABC Nightlife Radio , radio interview, ABC Nightlife	2020
SpaceTime podcast	2020
Triple J , radio interview	2020