

Landscapes, Seascapes and Biota: Unique WA – Past, Present and Future

The University Club, UWA
27-28 July 2018

Keynote Talks will present reviews on broad topics that together will provide a substantial overview of the latest understanding of major aspects of the natural sciences in Western Australia. The review manuscripts will be published in the Journal of The Royal Society of Western Australia as a symposium volume.

Posters will outline the results of specific research projects and be on any aspect of the natural sciences related to Western Australia, or on research being done in Western Australia on natural science topics elsewhere. The natural sciences include, for example, the Biological, Earth and Space, Marine and Environmental, and Archaeological Sciences and those parts of Chemistry, Physics, Mathematics and Engineering applied to the natural sciences. Prizes will be offered for the best posters displayed by Postgraduate Students (Honours, Masters, PhD levels), and by Early Career Science Researchers (work done by those with less than 5 years of research work after graduation, not including career interruptions). As well as hard copy posters, presenters are encouraged to prepare an e-Poster copy which will be projected during the symposium and later placed, with authors' permission, on the Society's website.

Provisional Program

Friday 27 July 2018

8.00-8.30: [Morning Coffee/Tea](#)

8.30-9.00: 1. Welcome to Country & Opening of Symposium

9.00-9.30: 2. [Keynote talk](#): [Archean WA]: *Simon Wilde et al.*

9.30-10.00: 3. [Keynote talk](#): The assembly and reworking of cratonic WA: a legacy of three Precambrian supercontinent cycles: *Zheng-Xiang Li, Sergei Pisarevsky, Yebo Liu, Camilla Stark, Uwe Kirscher, Ross Mitchell*

10.00-10.30: 4. [Keynote talk](#): Western Australia's Phanerozoic phases and phenomena: interrelationships between tectonics, climate and landscape over the last 540 million years: *Arthur Mory, David Haig, John Backhouse, Peter Haines*

10.30-11.30: [POSTERS & Morning Tea \(Banquet Hall\)](#): [e-poster presentations](#)

Friday 27 July 2018

11.30-12.00: 5. **Keynote talk:** News ways to image ancient environments in Western Australia: *Julien Bourget et al.*

12.00-12.30: 6. **Keynote talk:** New ways to image modern landscapes & seascapes: *Nik Callow, Ben Radford, Sharyn Hickey*

12.30-1.30: **POSTERS & Lunch (Banquet Hall): e-poster presentations**

1.30-2.00: 7. **Keynote talk:** The evolution of life: Its preservation across ocean anoxic events (and major mass extinction events) from biomolecules and geomolecules to cellular remains: *Kliti Grice*

2.00-2.30: 8. **Keynote talk:** Microbiomes of Western Australian marine environments: *Megan Huggett, Chris Kavazos, Rachele Bernasconi, Charlie Phelps, Flavia Tarquinio, Belinda Martin, Pep Gasol, Jackie Jones, Melissa Danks*

2.30-3.00: 9. **Keynote talk:** Fossil algae and unicellular "Protista" in ancient environments of Western Australia - a unique Southern Hemisphere record: *David Haig, Richard Howe, Daniel Mantle, Daniel Peyrot, John Backhouse*

3.00-3.30: 10. **Keynote talk:** Greening of WA landscapes: the Phanerozoic plant record: *Daniel Peyrot, Daniel Mantle, John Backhouse*

3.30-4.00: **POSTERS & Afternoon Tea (Banquet Hall)**

4.00-4.30: 11. **Keynote talk:** Modern terrestrial plant biogeography in WA: collection patterns and biases: *Paul Gioia*

4.30-5.00: 12. **Keynote talk:** The Root Causes of Plant Diversity Hotspots in Western Australia: *Mark Brundrett*

5.00-5.30: 13. **Keynote talk:** Modern seagrass and macroalgal biogeography in WA, an update: *Diana Walker, John Huisman, Kieryn Kilminster, John Kuo*

Free Public Lecture

6.30-7.30: **Assembling the Human Body Plan - A Tale Told By Fossils:** *John Long* (The University Club Theatre Auditorium)

Saturday 28 July 2018

8.30-9.00: [Morning Coffee/Tea](#)

9.00-9.30: 14. [Keynote talk](#): Major changes in WA shallow marine invertebrate faunas during the Phanerozoic - long and short-term controls: *Eckart Hakansson, Ken McNamara, David Haig*

9.30-10.00: 15. [Keynote talk](#): Marine invertebrate biogeography of the North West shelf: A tribute to Barry Wilson: *Lisa Kirkendale, Zoe Richards, Andrew Hosie*

10.00-10.30: 16. [Keynote talk](#): Invertebrates colonizing ancient landscapes - the Phanerozoic WA record: *Ken McNamara, Sarah Martin*

10.30-11.30: [POSTERS & Morning Tea \(Banquet Hall\)](#): [e-poster presentations](#)

11.30-12.00: 17. [Keynote talk](#): Invertebrates in modern WA terrestrial and inland-water environments: *Mark Harvey, Kym Abrams, Catherine Car, Raphael Didham, Joel Huey, William Humphreys, Annette Koenders, Jonathan Majer, Melinda Moir, Adrian Pinder, Michael Rix, Nikolai Tatarnic*

12.00-12.30: 18. [Keynote talk](#): Fossil vertebrates from ancient marine environments in Western Australia: *Mikael Siversson, Kate Trinajstic, John Long*

12.30-1.00: 19. [Keynote talk](#): Dinosaurs and other terrestrial and freshwater vertebrates from the Western Australian segment of ancient Gondwana: *Steve Salisbury, John Long*

1.00-2.00: [POSTERS & Lunch \(Banquet Hall\)](#): [e-poster presentations](#)

2.00-2.30: 20. [Keynote talk](#): Late Quaternary mammalian faunal responses to environmental change in South-West Australia: *Gavin Prideaux*

2.30-3.00: 21. [Keynote talk](#): Human origins in Western Australia: *Joe Dortch, Jane Balme, Peter Veth, Kate Morse, Jo McDonald*

3.00-3.30: 22. [Keynote talk](#): Runoff and groundwater responses to climate change in Southwest Western Australia: *Don McFarlane, Richard George, Richard Silberstein, Steve Charles*

3.30-4.00: [Afternoon Tea \(Banquet Hall\)](#)

Saturday 28 July 2018

4.00-4.30: 23. **Keynote talk:** Progressing Western Australian collision with Asia: implications for regional orography, oceanography, climate and marine biota: *Myra Keep, Ann Holbourn, Wolfgang Kuhnt, Stephen Gallagher*

4.30-5.00: 24. **Keynote talk:** Old climatically-buffered infertile landscapes and seascapes yield new perspectives on Western Australia's biodiversity and its conservation: *Steve Hopper, Hans Lambers, Tim Langlois*

5.00-5.30: 25. **Keynote talk:** Implications for Human communities from future environmental change in Western Australia: *Petra Tschakert*

President's Dinner

6.30-10.30 pm: Three course meal and beverages provided. The Dinner will include presentation / announcement of the RSWA Awards for 2018 and the Symposium Poster Awards, as well as the 2018 RSWA President's Address. Attendance is separately costed on Registration Form. ([Banquet Hall South](#))

List of 68 confirmed contributors to Keynote presentations

as of 7 February 2018

Dr Kym Abrams: Specialist in subterranean arthropods, molecular systematics, taxonomy and phylogeography, ABRS Research postdoctoral fellow, School of Biological Sciences, University of Western Australia.

Dr John Backhouse: Specialist in Palynology; Honorary Research Fellow, School of Earth Sciences, UWA; formerly Principle Research Fellow UWA; Senior Geologist, Geological Survey of Western Australia.

Rachele Bernasconi: PhD on characterisation of coral-Symbiodinium-bacteria networks on different investigation levels (geographical, temporal and environmental); including the use of Next Generation Sequencing and Network analyses; School of Science, Edith Cowan University.

Professor Mark Brundrett: Specialist in mycorrhizal ecology, the evolution of roots and mycorrhizas, defining mycorrhizas and orchid conservation biology; Senior Ecologist, Western Australian Department of Biodiversity, Conservation and Attractions.

Dr Nik Callow: Specialist in Geomorphology, Earth surface processes, GIS, remote sensitive and unmanned aerial vehicles, hydrology, landscape analysis, physical geography, environmental science, School of Agriculture and Environment, UWA.

Dr Catherine Car: Specialist in the taxonomy of Australian millipedes. Research associate, Western Australian Museum; Research fellow, School of Biological Sciences, University of Western Australia.

Dr Steve Charles: Specialist in hydroclimatic scaling, climate changing projection at regional scales, seasonal climate forecasting, and the impacts of climate variability and change on hydrology and water supply systems; Senior Research Scientist at CSIRO Land and Water.

Dr Melissa Danks: Specialist in microbial and mammal ecology with a focus on biodiversity research and particular interests in DNA isolation, fungal taxonomy, and ecological interactions between truffle-like fungi and mammals, School of Science, Edith Cowan University.

The Royal Society of Western Australia - Symposium 2018 Program

Professor Raphael Didham: Specialist in insect community ecology focusing on the synergistic effects of multiple drivers of global change on biodiversity and ecological resilience within remnant natural ecosystems. Professor of Ecology in the School of Biological Sciences at UWA, and joint research appointment at CSIRO Land and Water.

Dr Joe Dortch: Specialist in Environmental Archaeology and niche construction theory; Australian Aboriginal archaeology; taphonomy; faunal remains analysis; anthracology (taxonomic analysis of charcoal); use of ancient DNA in archaeology.

Associate Professor Stephen Gallagher: Specialist in micropalaentology, especially in the application of stratigraphy and micropalaeontology to interpret bathymetry and palaeoceanography. Recent work has focused on Cenozoic marine sequences of offshore WA, University of Melbourne.

Professor Pep Gasol: Research Professor, interested in planktonic microbe abundances and activity, and their effects on the ecosystem. Institut de Ciències del Mar, Passeig Marítim de la Barceloneta.

Dr Richard George: Specialist in land and water studies for irrigation and dryland agriculture, resource condition assessment and management; Principal Research Scientist; Department of Primary Industries and Regional Development; Adjunct Professor, School of Agriculture and Environment, University of WA.

Paul Gioia: Specialist in biodiversity information management, examining patterns of plant biodiversity within south-west Western Australia, online GIS biodiversity mapping; Principal Research Scientist (Information), WA Department of Biodiversity, Conservation and Attractions.

Professor Kliti Grice : Specialist in biomarker geochemistry and compound specific isotope analyses (CSIA) especially associated with mass extinction events, palaeoenvironmental and palaeoecological reconstructions, petroleum and mineral systems. She is an organic geochemist who creatively combines geological information with data on biomarkers and their stable carbon, hydrogen and sulfur isotopic compositions to reconstruct details of microbial, fungal and floral inhabitants of ancient aquatic environments especially those associated with anoxic events and prolific source rocks. She also researches the role of molecular level. John Curtin Distinguished Professor, Director of WA-Organic and Isotope Geochemistry Centre, Curtin University.

Dr David Haig: Specialist in marine sedimentology, stratigraphy, palaeontology (foraminiferal micropalaeontology), stratigraphy of New Guinea, Timor and Western Australian Carboniferous to Holocene sedimentary basins; Senior Honorary Research Fellow, retired professor, Centre for Energy Geoscience, School of Earth Sciences, UWA.

Dr Eckart Hakansson: Specialist in palaeontology (Bryozoa), marine sedimentology, stratigraphy; Emeritus Professor, University of Copenhagen; Honorary Research Fellow, Centre for Energy Geoscience, School of Earth Sciences, UWA.

Dr Mark Harvey: Specialist in arachnids and myriapods, including their phylogenetic history and evolutionary relationships, taxonomy of arachnids and myriapods, and especially the documentation and description of new species; Senior Curator of Arachnology, Western Australian Museum.

Sharyn Hickey: Specialist in the application of GIS and remote sensing to coastal and marine environments, including the use of satellite, airborne, and unmanned aerial vehicle data to support long-term monitoring, analysis of climate change and global species migration/translocation, carbon stocks and accounting in coastal/marine systems, Australian Institute of Marine Science, UWA Oceans Institute and School of Agriculture and Environment, UWA.

Dr. Ann Holbourn: Specialist in paleoceanography, isotope stratigraphy, and foraminiferal micropalaeontology. Senior scientist at the Institute of Geosciences, Kiel University, Germany.

Anna Hopkins: Lecturer in fungal ecology and conservation biology, with a focus on disturbance and ecosystem health. Centre for Ecosystem Management, School of Science, Edith Cowan University.

Professor Steve Hopper: Specialist in biodiversity and conservation, old climatically buffered infertile landscapes, plants of granite outcrops, Haemodoraceae, eucalypts, rare plants and pollination by vertebrates; Centre of Excellence in Natural Resource Management, UWA.

Dr Andrew Hosie: Specialist in Crustacea, in particular biodiversity and taxonomy, symbiosis between barnacles and sessile benthic invertebrates, introduced species, diversity of the Great Australian Bight and Kimberley regions; Curator of Crustacea and Worms, Western Australian Museum.

The Royal Society of Western Australia - Symposium 2018 Program

Dr Richard Howe: Specialist in nanofossil biostratigraphy and stratigraphic applications for petroleum industry; Adjunct Research Fellow, Centre for Energy Geoscience, School of Earth Sciences, UWA; formerly from Shell and Chevron; now an independent consultant.

Dr Joel Huey: Specialist in molecular systematics and population genetics, especially focusing on how genetic variation is maintained within, and structured among populations and species of arid zone fauna. Research Scientist, Western Australian Museum.

Dr Megan Huggett: Specialist in Marine Science, with a focus on the function, diversity and interactions of marine microbial communities. School of Environmental and Life Sciences, The University of Newcastle.

Dr John Huisman: Specialist in the taxonomy and systematics of marine benthic algae, and introduced and pest marine algae; Curator, Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions.

Dr William Humphreys: Specialist in subterranean biology and biogeography including cave, groundwater and anchialine ecosystems. Adjunct Professor, School of Biological Sciences, University of Western Australia. Formerly Senior Curator, Western Australian Museum.

Jacquelyn Jones: Honours completed on the impact of range shifts on the stability of the gut microbiome of the tropical herbivorous fish *Siganus fuscescens*; investigated using next generation sequencing and short chain fatty acid analysis; School of Science, Edith Cowan University.

Dr Christopher Kavazos: Specialist in ecology and understanding the processes regulating diversity across space and time; Centre for Ecosystem Management, Edith Cowan University.

Professor Myra Keep: Specialist in structural geology, tectonics, seismic interpretation, seismotectonics/neotectonics, structural and tectonic evolution of the North West Shelf of Australia; analogue modelling of structural systems; tectonic evolution of the northern Australian margin (including Timor), planetary geology; Centre for Energy Geoscience, School of Earth Sciences, UWA.

Dr Kieryn Kilminster: Specialist in marine ecology, environmental management, estuaries, seagrass, acid-sulfate soil, sediment, water chemistry, biogeochemistry, phosphorus; Western Australian Department of Water and Environment Regulation.

Dr Lisa Kirkendale: Specialist in Indo-West Pacific molluscs, in particular biodiversity, taxonomy and molecular systematics of Bivalvia, evolution of photosymbiosis in Cardiidae, including giant clams, introduced and commercially important molluscs, biodiversity survey in North West Shelf area; Curator of Molluscs, Western Australian Museum.

Dr Uwe Kirscher: Specialist in magnetostratigraphy, palaeogeographic reconstruction of Palaeozoic orogenic belts using palaeomagnetic data; supercontinent reconstructions; Earth Dynamics Research Group, Curtin University.

Dr Annette Koenders: Specialist in phylogeography, taxonomy and conservation of freshwater invertebrates; Senior Lecturer, Centre for Ecosystem Management, Edith Cowan University.

Dr. Wolfgang Kuhnt: Specialist in marine micropaleontology, paleoceanography and stratigraphy. Professor and director at the Institute of Geosciences, Kiel University, Germany.

Professor John Kuo: Specialist in seagrass including taxonomy, morphology, anatomy and ultrastructure; Senior Honorary Research Fellow, retired professor, Centre for Microscopy, Characterisation and Analysis, University of Western Australia.

Professor Hans Lambers: Specialist in mineral nutrition of Australian plants, mineral nutrition of crop and pasture species, plant physiology/ecology, structure and functioning of cluster roots, phosphorus-use efficiency, conservation biology; School of Biological Sciences, UWA.

Dr Tim Langlois: Specialist in a global perspective on impacts of long-term and acute environmental and anthropogenic disturbances in marine ecosystems, continental-scale changes in ecological patterns as revealed by analyses of non-destructive video surveys of fish assemblages; Research Fellow, Oceans Institute, UWA.

Yebo Liu: PhD project aims to use new paleomagnetic data from Proterozoic igneous rocks in Australia and East Antarctica to provide a better understanding of the Pre-Pangea supercontinents; received his bachelor degree from Sun Yat-Sen University in 2014 and joined Prof. Li's Earth Dynamics Research Group at Curtin University in 2015 as PhD student.

The Royal Society of Western Australia - Symposium 2018 Program

Professor Zheng-Xiang Li: Specialist in regional and global tectonics and palaeogeography, palaeomagnetism, and geodynamics. He is also interested in the relationships between major tectonic events, large mineralisation systems and major environmental/climate changes; John Curtin Distinguished Professor, Australia Laureate Fellow, Curtin University.

Professor John Long: Specialist in the early evolution of vertebrates in order to unravel the early stages of how the modern vertebrate body plan was assembled, Late Devonian Gogo fishes (including world's oldest embryos and early sexual dimorphism in vertebrates) and reconstructing their soft tissue anatomy, new early Devonian placoderms (stem-gnathostomes), the role of trace elements in mass extinction events, timing and origins of two key sensory systems in early fossil vertebrates (electroreception and nocturnality), origin of tetrapods in Gondwana; holds a Strategic Professorship in School of Biological Sciences, Flinders University.

Professor Jonathan Majer: Specialist in ant ecology, the role of invertebrates in mine land restoration, forest invertebrate ecology and the interaction between canopy arthropods and insectivorous birds. He is now retired and runs an invertebrate-focussed consulting business; Adjunct Professor of invertebrate conservation at Curtin University and University of WA.

Dr Daniel Mantle: Specialist in Upper Paleozoic and Mesozoic palynology in Western Australian basins and in New Guinea, Triassic-Jurassic dinoflagellate cyst taxonomy and the application of palynology to integrated sequence stratigraphic projects; Director and Palynologist, MGPALAEO Geological and Stratigraphical Consultants; Adjunct Research Fellow, UWA.

Belinda Coral Martin: PhD candidate on the seagrass rhizosphere (interaction among seagrass roots, sediments and microbial communities); School of Biological Sciences and UWA Oceans Institute, The University of Western Australia.

Dr Sarah Martin: Specialist in invertebrate paleontology, Mesozoic insects, Upper Paleozoic and Mesozoic Crustacea, Cenozoic echinoids, sedimentary basin analysis; Senior Geologist and Curator of Paleontological Collections, Geological Survey of Western Australia, Adjunct Research Fellow, School of Earth Sciences, UWA.

Dr Don McFarlane: Specialist in hydrogeology, climate change, water resources and remote sensing; Adjunct Professor, School of Agriculture and Environment, UWA; formerly Senior Principal Research Scientist at CSIRO Land and Water; now part-time consultant.

Dr Ken McNamara: Specialist in palaeontology, in particular the relationship between evolution and development, with particular reference to the fossil record; Emeritus Fellow, Downing College, Cambridge; formerly Director, Sedgwick Museum, University of Cambridge.

Dr Ross Mitchell: Specialist in modeling supercontinent cycles, that even allows us to speculate about the future assembly of supercontinent "Amasia". Research Fellow, Curtin University.

Dr Melinda Moir: Specialist in coextinction, terrestrial invertebrate biodiversity, conservation and management, and the taxonomy of Hemiptera (true bugs); Senior Research Officer, Western Australian Department of Primary Industries and Regional Development; Adjunct Research Fellow, School of Biological Sciences, UWA.

Dr Arthur Mory: Specialist in Phanerozoic stratigraphy, sedimentology, basin development and petroleum prospectivity in Western Australian sedimentary basins; Geological Survey of Western Australia; Adjunct Research Fellow, School of Earth Sciences, UWA.

Dr Daniel Peyrot: Specialist in Paleozoic and Mesozoic palynology of Australia, Western Europe, South America, Middle East and western and eastern Africa; Lecturer, Centre for Energy Geoscience, School of Earth Sciences, UWA.

Charlie Phelps: PhD candidate on microbial communities within the *Ecklonia radiata* holobiont, investigating how environmental conditions and disturbance effect the composition of microbial communities on the canopy forming kelp; School of Science, Edith Cowan University.

Dr Adrian Pinder: Specialist in aquatic invertebrate systematics (especially oligochaetes), survey and monitoring of aquatic invertebrates and waterbirds and the ecology and management of wetlands; Principal Research Scientist and leader of the Wetlands Conservation Program within the Department of Biodiversity, Conservation and Attractions.

Dr Sergei Pisarevsky: Specialist in paleomagnetism, plate tectonics and Precambrian geology; Senior research fellow and a member of the Earth Dynamics Research Group, Curtin University.

The Royal Society of Western Australia - Symposium 2018 Program

Professor Gavin Prideaux: Specialist in links between patterns in Australian mammal evolution, ecology and extinction, and climate- and human-driven environmental changes. Biological Sciences, Flinders University.

Dr Ben Radford: Specialist in marine remote sensing and spatial data including the innovative use of satellite, airborne, unmanned aerial vehicle, underwater Remote Operated Vehicles (ROVs) for mapping and understanding marine condition, processes and management, Australian Institute of Marine Science and School of Agriculture and Environment, UWA.

Dr Zoe Richards: Specialist in conservation of coral biodiversity, molecular systematics, biogeography and phylogeography, conservation genetics, population ecology, optimizing monitoring of coral biodiversity; Research Associate, Western Australian Museum and Research Fellow, Curtin University.

Dr Michael Rix: Specialist in arachnid systematics, especially southern-temperate and Australasian spiders, and in the systematics, biogeography and conservation of terrestrial invertebrates; Research Fellow, Queensland Museum.

Dr Steve Salisbury: Specialist in the evolution of Gondwana continental vertebrates, in particular dinosaurs and crocodylians; vertebrate biomechanics and using extant animals to better understand the anatomy, behaviour and evolution of extinct ones. School of Biological Sciences, University of Queensland.

Dr Mikael Siversson: Specialist in Mesozoic elasmobranchs (especially Cretaceous lamniform sharks), dinosaurs, mammals (multituberculates), pterosaurs, mosasaurs, turtles, and Late Cretaceous Oceanic Anoxic Event II; Curator of Palaeontology, Western Australian Museum.

Camilla Stark: Currently completing a PhD at Curtin University where she investigates mafic dykes in Western Australia and East Antarctica using U-Pb and Ar/Ar geochronology and geochemistry; received a BSc from Oslo University and studied fluid-rock interaction during gold mineralisation for her MSc at Monash University.

Dr. Flavia Tarquinio: Specialist on seagrass microbiome, including the diversity of bacterial and archaeal communities associated with seagrass leaves and the mutual advantages obtained from this partnership, School of Science, Edith Cowan University.

Dr Nikolai Tatarnic: Specialist in true bug behaviour, ecology and evolution; Curator of Entomology at the Western Australian Museum.

Associate Professor Kate Trinajstić: Specialist in vertebrate palaeontology, how early vertebrates evolved novel morphology such as an internal skeleton and complex musculature, role of internal fertilization and how this impacted on the diversification and radiation of early fishes, micro-analytical techniques, including the application of micro-CT and synchrotron scanning of fossil materials, biostratigraphy using conodonts and the teeth and scales of sharks to date rocks, the mechanism of soft tissue preservation and the evolution of electroreception; School of Science, Curtin University.

Professor Petra Tschakert: Specialist in human-environment interactions, rural livelihoods, development, environmental justice, participatory methodologies; with projects in climate change adaptation, adaptive capacity, anticipatory learning, and loss and damage; marginalization, contamination, and justice in small-scale gold mining; deliberate societal transformation; environmental/climatic changes and forced migration; terrestrial carbon sequestration and climate change mitigation; School of Agriculture and Environment, University of Western Australia.

Professor Diana Walker: Specialist in marine macrophytes, especially seagrasses and their functional roles; School of Biological Sciences, University of Western Australia.

Professor Simon Wilde: Specialist in the application of fieldwork, petrology, geochemistry and geochronology to the study of continental crustal evolution; John Curtin Distinguished Professor, Department of Applied Geology, Curtin University.