

# Why Proterozoic Basins Provide Unique Insights from Modelling Techniques

**Audience:** This one-day short course is aimed at geoscientists from both industry and academia who wish to gain a better understanding how the state-of-the-art geophysical, numerical and analogue modelling methods can be applied to better understand the evolution of Proterozoic basins, with the Greater McArthur basin as a case study.

**Course content:** This course will provide findings from the ARC Linkage/MRIWA M554 Evolution of Proterozoic multistage rift basins project. Researchers from the University of Sydney, Monash University, and the University of Western Australia will showcase their work, which include a variety of modelling techniques, for example: analogue, geophysical and numerical geodynamic modelling, to understand the evolution of Proterozoic basins from extension to inversion, with special emphasis on the Greater McArthur basin.

Proterozoic basins are essentially windows into the Earth's early history, providing insights into the evolution of the planet's crust and lithosphere. Modern modelling techniques continue to uncover new information, making these ancient geological formations invaluable for scientific research and resource exploration.

**Duration:** 1 day - 09:00 to 17:30, 17:30 onwards sundowner (Perth time – GMT+8)

**Location:** HYBRID: online/in person at the University Club of Western Australia, Entrance 1, Hackett Drive, Nedlands

**Cost:** CET Members AU\$350 + GST | Non-Members AU\$500 + GST | UWA Students AU\$50 + GST

**Registration:** For registration and payment information please visit our website:

[www.cet.edu.au](http://www.cet.edu.au) and for more information please email us at [info.cet@uwa.edu.au](mailto:info.cet@uwa.edu.au)

5<sup>th</sup> November 2024



# Schedule

| TIME                                 | SPEAKERS            | TOPIC   |
|--------------------------------------|---------------------|---|
| <b>TUESDAY 05/11/2024</b>            |                     |   |
| 9:00-9:15                            | Weronika Gorczyk    | Welcome and quick overview of Proterozoic basins  |
| <b>TOPIC: GEODYNAMICAL MODELLING</b> |                     |   |
| 9:15-10:20                           | Patrice Rey         | Thermo-mechanical framework for Proterozoic basins development and inversion  |
| 10:20-10:50                          | <b>COFFEE BREAK</b> |   |
| <b>TOPIC: ANALOGUE MODELLING</b>     |                     |   |
| 10:50-11:10                          | Sandy Cruden        | Lithospheric scale analogue experiments of orthogonal extension and inversion   |
| 11:10-11:50                          | Uchitha Nissanka    | Analogue Modelling of rifting and inversion: the effects of degree obliquity  |
| 11:50-12:10                          | Sandy Cruden        | Episodic subsidence in intraplate sag basins by flow of non-Newtonian mantle  |
| 12:10-13:00                          | <b>LUNCH BREAK</b>  |   |
| <b>TOPIC: GEOPHYSICAL MODELLING</b>  |                     |   |
| 13:00 - 13:40                        | Lu Li               | Mantle and crustal structures under the McArthur Basin  |
| 13:40 - 14:20                        | Sina Ozaydin        | A novel workflow for interpreting magnetotelluric anomalies: 4D modelling with converting numerical geodynamic experiments into magnetotelluric models          |
| 14:20 - 15:00                        | Alan Aitken         | A template for unravelling ambiguity in subsidence drivers from distal plate margins, crustal processes and lithosphere modification for craton-marginal basins |
| 15:00-15:20                          | <b>COFFEE BREAK</b> |   |
| 15:20-16:00                          | Weronika Gorczyk    | The evolution of the Yeneena basin, and its place in Supersequence 1 of the Centralian Superbasin   |
| 16:00-16:20                          | Patrice Rey         | Convergent gravitational collapse explains coeval intra-cratonic doming and nappe tectonics, central Australia  |
| 16:20-16:40                          | Pete Betts          | The Basement-Basin interface (lessons from the Tennant Creek Block)   |
| 16:40-17:20                          | Pete Betts          | Geological insights and Modelling efforts in the Greater McArthur Basin   |
| 17:20-17:40                          | <b>DISCUSSION</b>   |   |
| 17:40-19:00                          | <b>SUNDOWNER</b>    |   |