SMEDG STUDENT NIGHT

Thursday 26th February

We will be starting the year in grand style, celebrating the talents and achievements of some of our 'rockstar' students, who are now part of the SMEDG community. We will hear presentations from several of our 2025 SMEDG Geoscience Honours Scholarship winners, as well as from two outstanding PhD students.

As usual, there will be drinks and pizzas before the meeting, a casual dinner with our speakers after the meeting, and we will be raffling prizes of small items of geological field equipment for our students. So please join us for a night of fun and celebration !

Our 2025 SMEDG Geoscience Honours Scholarship winners

Charlotte Billinghurst (UNSW)

Charlotte is an Earth Science and Ecology Honours graduate from UNSW. She has strong career and research interests in mine restoration, land management and mineral exploration. She is particularly interested in this intersection between the two fields of geology and ecology, and explored this in her recently completed Honours research.

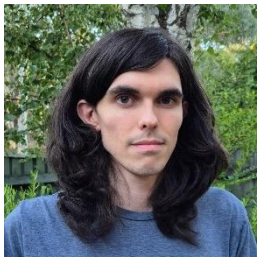
Her project investigates how plants which accumulate heavy metals can be used as tools in biogeochemical exploration and for mine rehabilitation. Her study investigates whether we can predict which plants are the best at accumulating metals, through plant traits, phylogeny, and relationships with multi-metal uptake. The answer, however, is not so simple.

Penelope Beltran-Rehberg (USYD)

Penelope recently completed a BSc (Honours I, University Medal) at the University of Sydney. Her research examined heat sources for Proterozoic granulite facies metamorphism through modelling, fieldwork in the Broken Hill Domain, and petrography. She is also active in geology education and outreach, and will soon commence a PhD in Geology at the University of Sydney.

Her project investigates the heat source of Proterozoic granulite facies metamorphism at Broken Hill. Numerical experiments indicate that extension alone cannot produce granulite facies temperatures in Proterozoic terranes; additional magmatic or basal heat is required. Our model predictions were compared against field and petrographic observations from the Broken Hill Domain, but comparisons remained inconclusive.

Bae Beezley (ANU)



Bae graduated with BSc(Hons) in 2025, and he will be presenting his research on the Gifford Creek Carbonatite Complex (GCCC) which is a prospective Nb and REE deposit located in the Gascoyne Province,

Western Australia. The goal of the project was to characterise Nb within the complex. Nb is primarily hosted by the minerals pyrochlore and columbite-(Fe), and shows a close association with metasomatic alteration. He is now a PhD student at the Australian National University, investigating the petrology of the Rocha da Rocha critical minerals province in Brazil. His research interests are ore deposit formation, igneous petrology and anything to do with weird and unusual rocks.

Our PhD Students

Hojat Shirmard (USYD) - "AI in Mineral Exploration: From Code to Core."

Hojat is a PhD candidate in the EarthByte Group, School of Geosciences, at the University of Sydney. He has been involved in more than 200 mineral exploration projects across various districts in Iran and Australia, with experience spanning geophysics, remote sensing, geology, and geochemistry. His current research focuses on *Spatio-temporal Data Mining in Mineral Exploration*. In this presentation, he will discuss both the risks of using AI and the risks of *not* using AI in mineral exploration. He will draw on my academic research as well as real-world industry experience to demonstrate how AI applications in geology, geophysics, and satellite imagery have contributed to mineral discoveries.

Elnaz Heydari (USYD) – "A Machine Learning Framework for Prospectivity Mapping of Cu–Au Porphyry Mineralisation in the Lachlan Fold Belt".

Elnaz is a PhD candidate at the University of Sydney's EarthByte Group, School of Geosciences. She has contributed to over 150 mineral exploration projects, applying remote sensing and integrating geophysical, geological, and geochemical data. Her research focuses on "deep-time exploration for mineral deposits along convergent margins" to support sustainable mineral discovery. She will present a machine learning framework developed to predict porphyry mineralisation in the Lachlan Fold Belt. The model integrates geospatial data layers to map high-potential exploration targets.