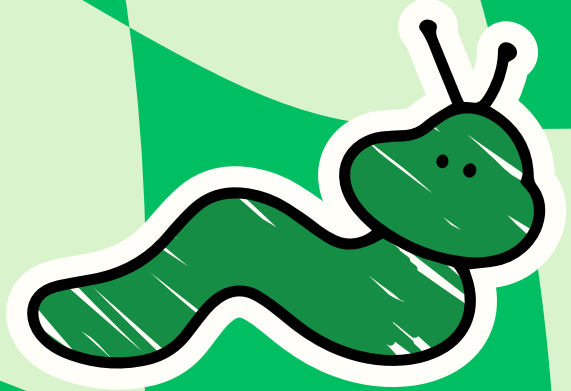
StuCon 2026

17TH & 18TH AUGUST, JAEGER 1

Official Conference Program



StuCon 2026 Program

PRESENTATION SESSION 1

11:00am - 12:30pm

Jiarun Zhou - Isotropic Tomography for Two-layer Earth's Upper Inner Core - Finding Vertical Continuity of Velocity Structures and the Potential for Internal Convection

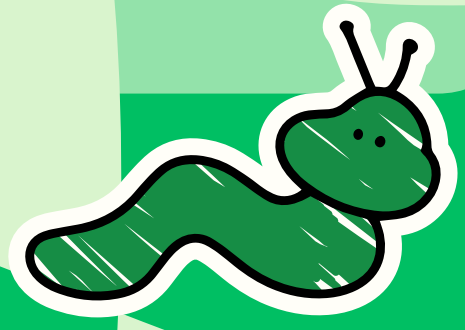
Kathryn Keane – Extracting Critical Metals from Mine Waste using Molten Alkali Salts

Alex Molyneux – Secondary CaCO3 precipitation during ocean alkalinity enhancement: comparison of the precipitation characteristics of common alkaline feedstocks.

Seb Bland - Living in pH purgatory: The impact of symbiosome pH on endosymbiont function.

Gayani Ranasinghe – Interferometric synthetic aperture radar (InSAR) and SWOT

Yun-Ze Cheng – From Mooncakes to Moonquakes: Mystery of the lunar core



JIARUN ZHOU

Isotropic Tomography for Two-layer Earth's Upper Inner Core - Finding Vertical Continuity of Velocity Structures and the Potential for Internal Convection

The compressional-wave velocity structure of the Earth's inner core (IC) is a key focus of geophysical research. Previous studies have revealed both lateral and vertical heterogeneity within the IC, with one of the most prominent features being an isotropic uppermost ~100 km shell overlying a more anisotropic deeper interior. In this study, we divide the upper 400 km of the IC into two spherical layers: the uppermost 100-km layer and an underlying 300-km layer. After correcting observed seismic travel times for cylindrical anisotropy, we investigate the continuity of isotropic velocity between the two consecutive layers. We employ an equal-area hexagonal mesh for spherical discretization, which achieves nearly consistent global resolution and minimizes bias associated with unequal cell sizes in conventional latitude–longitude grids. Our results reveal common structural features shared by both layers, along with a systematic decrease in compressional-wave velocity from the deeper layer toward the surface. This discovery is supported by radial anisotropy potentially generated by large-scale thermal convection within the IC.

KATHRYN KEANE

Extracting Critical Metals from Mine Waste using Molten Alkali Salts

The mining industry globally has produced large quantities of tailings, containing untapped resources that are becoming increasingly desired with the progression of technology, such as solar panels, turbines, and phones. This is particularly applicable to rare earth elements (REE) that are utilised in catalysts, magnets, and for defence purposes. Uranium mine tailings, or fines, have been found to contain potentially economically viable concentrations of REE, such as tailings from the Mary Kathleen and Olympic Dam mines. Standard industry methods for deposit-based REE extraction are not able to economically process the fines due to the miniscule mineral size and intricate mineral and phase-bearing geochemistry. Other processes are being investigated, however currently proposed REE extraction from tailings is founded on complex multi-stage processes that have yielded mixed and underwhelming results during the experimental phase. We are therefore devising a novel extraction method to remove a variety of REE from fine-milled tailings, and do so using readily available equipment. Methods currently include roasting tailings with salts to induce flux melting. Results indicate methods have been successful, with REE forming discreet mineral grains and REE-bearing crystals increasing in size relative to starting tailings.

ALEX MOLINEUX

Secondary CaCO3 precipitation during ocean alkalinity enhancement: comparison of the precipitation characteristics of common alkaline feedstocks

Ocean Alkalinity Enhancement (OAE) is a carbon dioxide removal (CDR) technology with the potential to sequester atmospheric CO2 while also reducing ocean acidification. The efficacy of the technology is considerably reduced by secondary CaCO3 precipitation caused by excessive alkalinity addition. Existing research has focussed on small scale (0.5-3 L) sealed experiments, while here results are presented from larger scale (175 L) experiments that better approximate ocean conditions and compare all of the most common direct-addition alkaline feedstocks – NaOH solution, Mg(OH)2 solid and Ca(OH)2 solid. Results indicate that the precipitation threshold is variable and dependent not only on the amount of added alkalinity, but also on material type. They also imply a relationship between precipitation and tank geometry (i.e. surface area and volume). Solid Mg(OH)2 feedstock was found to have a significantly higher precipitation threshold than both solid Ca(OH)2 and NaOH solution feedstocks. The recorded threshold for CaCO3 precipitation with Mg(OH)2 is significantly higher than previously thought, with the threshold likely ΔTA ≈ 1200 µmol kg-1 as opposed to the ΔTA ≈ 500 µmol kg-1 estimated for other minerals. These findings considerably increase the attractiveness and effectiveness of OAE as a CDR technique. However, significant improvements need to be made to current research methods to ensure comparability between studies and to allow for meaningful in-situ data to be collected.

SEB BLAND

Living in pH purgatory: The impact of symbiosome pH on endosymbiont function

It has often been suggested that the coral symbiosome, which houses the endosymbiotic dinoflagellates, has a pH lower than that of seawater. This is proposed as a mechanism to shift the carbonate system towards increased CO2 availability, ensuring a constant carbon source for photosynthesis. In vitro measurements on coral species A. yongei and S. pistillata suggested that these symbiosome could have a pH as low as 4. While these authors were confident in these results, the dye utilised has low precision, and the scale of change so large that it would be interesting to investigate this further. By shifting the focus away from the host to the symbionts we aim to illuminate the extent of their pH tolerance. Here isolated dinoflagellate grown in known buffered pH solutions will allow for a robust investigation into the ability of these symbionts to survive at a range pH conditions and interrogate the influence of pH on photosynthetic function. These experiments offer new insights on the nature of the symbiosis itself. Breaking from decades of mainstream thought, new research suggests that the symbiosis isn't as mutualistic as one thought. Instead, the corals 'farm' the symbionts for their photosynthetic products, while limiting nitrogen abundance to ensure compliance5. Could low pH be another way to extend control?

GAYANI RANASINGHE

Interferometric synthetic aperture radar (InSAR) and SWOT

InSAR is a remote sensing geodetic technique for precise measurement of topography, surface change and surface displacement. A satellite emits a radar pulse, which scatters off the earth surface and returns carrying two types of information; amplitude and phase. From the interference of phase of two or more SAR acquisitions over the same area is used to detect the surface deformation. Missions such as Sentinel-1, ALOS use InSAR instruments for deformation mapping. The Surface water and Ocean Topography (SWOT) mission, launched in Dec 2022 carries a Ka-band Radar interferometer (KaRIn) a dual -antenna interferometric synthetic aperture radar (InSAR) instrument designed to measure surface elevation. Unlike conventional side looking InSAR instruments, KaRIn images two parallel swaths on either side of the satellite ground track, each roughly 50 km wide, using single pass across track interferometry between two antennas mounted on a roughly 10 m boom. This allows SWOT to derive surface height directly from the interferometric phase difference between two channels, without requiring repeat pass acquisitions unlike most spaceborne InSAR satellites.

YUN-ZE CHENG

From Mooncakes to Moonquakes: Mystery of the lunar core

The Moon's thermal evolution and dynamo history are limited by the poorly resolved size and state of the lunar core. Apollo passive seismic data show that shear waves (S-waves) from deep moonquakes become undetectable beyond ~120° distance. Prior studies attributed this sharp onset to a strongly attenuated partial-melting layer (PML) overlying a smaller core. We demonstrate instead that this absence of S-wave can also be explained as the onset of a geometric core shadow zone produced by refraction at a substantially larger core mantle boundary. Forward modelling of shadow-zone boundaries and travel times, constrained by self-consistent lunar interior models, yields a core radius of 497–580 km, 30 ± 10 % larger than the most recent reference model. This enlarged core eliminates the need for a basal PML, provides a physically consistent explanation for the concentration of deep moonquakes near 900 km depth through tidal stress localization above a fully solid lower mantle, and results in the first 1-D lunar model that simultaneously satisfies both near-side and far-side seismic constraints. Our results have implications for the Moon's bulk composition, magma ocean evolution, and dynamo history, with direct predictions testable by upcoming far-side seismic missions, such as the Australian Spider.

StuCon 2026 Program

PRESENTATION SESSION 2

11:00am - 12:30pm

Riik Basu – Optimisation of inverting the mantle convection process

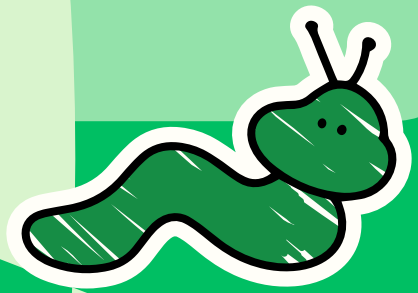
Prerana Mishra – What Does a Mantle Rock Tell?

Hangyu Meng – The role of future weakened AMOC in controlling Southern Ocean deep water properties

Salome Urien – Dinoflagel-late or Dinoflag-early; constraint on dinoflagellate emergence, their impact on surface oxygenation, biogeochemical cycles, and evolution

Ammu Sanjayan – Teleseismic S-Wave Coda Autocorrelation and Vp/Vs distribution over the Antarctic Ice Sheet

Huiyun Deng – Towards daily mascon solutions for GRACE-FO using a Kalman filter



RIIK BASU

Optimisation of inverting the mantle convection process

Mantle convection is the driving process of the thermal evolution of the earth, also driving the plate tectonics along with a host of other implications like geo-chemical changes and mineral deposits. However, there is a limited set of observed data available for the different parameters of interest. Hence, the approach of inversion is quite helpful in trying to constrain the underlying physical parameters leading all the way up to the initial time of interest. Therefore, a computational framework is required for the inversion of this mantle convection process. The primary focus is on constraining the differences in the set of observed and predicted data, termed as misfit, with gradient based methods aided by adjoints. A couple of 2D toy problems, a box model and a circular annulus problem is created simulating mantle convection. Different gradient-based optimisers based on line-search and trust-region methods are explored using libraries like Rapid Optimisation Library (ROL) and the Portable, Extensible Toolkit for Scientific Computation (PETSC) Toolkit for Advance Optimisation (TAO). The convergence of the inversion process needs the misfit to be robustly minimised with the minimum amount of computational resources being used up which are sensitive to different factors like the data pre-conditioning, smoothing and damping, the initial guess of the model parameter along with the optimisation strategy and the associated optimisation parameters.

PRERANA MISHRA

What Does a Mantle Rock Tell?

National-scale magnetotelluric (AusLAMP) and seismic (AusArray) surveys image the lithosphere beneath the Australian continent. However, these geophysical methods lack direct geological calibration, limiting their effectiveness in distinguishing fertile from depleted mantle domains. Mantle xenoliths—fragments of deep lithosphere transported to the surface by volcanic eruptions—provide direct, though sparse and discontinuous, samples of the continental root.

The Newer Volcanic Province in southeastern Australia is well known for its numerous xenolith localities, making it an ideal region to compare mantle xenolith compositions with geophysical responses. This comparison serves as a proof of concept for geophysical calibration. This talk presents new in-situ geochemical results from several xenolith sites, including the previously unstudied Wiridgil Hills xenoliths.

Electron microprobe and LA-ICP-MS analyses were conducted on olivine, orthopyroxene, clinopyroxene, and spinel across this suite of xenoliths. The Wiridgil Hills xenoliths are equilibrated within the spinel facies and predominantly consist of lherzolites and clinopyroxene-poor lherzolites. The olivine Fo% (88.1–91.9) and spinel Cr# values define a “classic” mantle depletion trend. Ca-in-orthopyroxene thermometry indicates a narrow range of equilibration temperatures between 913°C and 941°C. However, trace element abundances in clinopyroxenes reveal evidence of cryptic metasomatism. Ti/Eu and (La/Yb)N systematics further suggest the involvement of two distinct metasomatic agents.

These preliminary results demonstrate the methodology that we aim to develop to construct detailed compositional and thermal profiles of the lithospheric mantle. This approach allows geophysical anomalies to be interpreted in terms of composition, transforming magnetotelluric (MT) and seismic maps into effective predictive tools for mineral exploration.

HANGYU MENG

The role of future weakened AMOC in controlling Southern Ocean deep water properties

Because North Atlantic Deep Water acts as a precursor of Circumpolar Deep Water (CDW) in the Atlantic Meridional Overturning Circulation (AMOC), shifts in the AMOC can be expected to impact CDW properties in the Southern Ocean. To investigate the Southern Ocean response to suppressed NADW production and the weakened AMOC, we conduct a meltwater perturbation experiment using a high-resolution global ocean sea ice model. The anomalous meltwater (2500 Gt/yr) around Greenland is applied in the meltwater experiment, which triggers the slowdown of the AMOC in the entire Atlantic basin. In the Southern Ocean, our results from the meltwater forcing experiment show the weakened CDW upwelling in the Atlantic sector, associated with the cooling and freshening of CDW. In turn, the CDW upwelling is strengthened in the Pacific sector, acting to compensate the wakened CDW upwelling in the Atlantic sector. Further, CDW becomes warmer and saltier in the Indo-Pacific sector, which is consistent with the see-saw pattern between the Atlantic and Indo-Pacific Sectors. These results suggest that AMOC weakening can substantially reorganize Southern Ocean deep-water pathways and CDW properties through an inter-basin overturning compensation mechanism.

SALOME URIEN

Dinoflagel-late or Dinoflag-early; constraint on dinoflagellate emergence, their impact on surface oxygenation, biogeochemical cycles, and evolution

The most important organisms in marine ecosystems are primary producers (PP). Forming the base of the food chain, they utilize the energy of the sun and CO2 to generate organic matter via photosynthesis, thereby releasing O2 and supplying all other marine organisms with essential nutrients. The oceans have seen four major transitions in PP assemblages through time, and it is essential to understand how these have contributed to major changes in marine ecosystems. The dominant PP in modern assemblages are chlorophyll *c* algae, notably dinoflagellates, diatoms, and coccolithophores, all of which are larger than the previous generation of PP (green algae) and exhibit more complex mobility and sinking behaviors. This directly impacts the spatial and temporal distribution of nutrients and oxygen in the water column. Therefore, ocean ecosystems must have undergone drastic changes with this change of regime. The first chlorophyll *c* algae to have become dominant are dinoflagellates. While the date of emergence of later diatoms and coccolithophores is relatively well known, the timing of the transition from green algae to dinoflagellates, the most important and relevant for modern marine ecosystems, remains poorly constrained. Using biomolecular fossils (biomarkers) and microfossils, we aim to determine when and why dinoflagellates became the first abundant chlorophyll *c* algae, and how this impacted marine ecosystems.

AMMU SANJAYAN

Teleseismic S-Wave Coda Autocorrelation and Vp/Vs distribution over the Antarctic Ice Sheet

The Antarctic Ice Sheet holds enough freshwater to raise global sea levels by ~58 meters if fully melted, making studies of internal structures and subglacial environments important in understanding its stability subjected to long-term climate forcings. Seismology utilizes signals generated from natural seismic sources, such as incident wavefields arriving from distant earthquakes, to provide a non-invasive method for ice sheet subsurface investigation. In addition, the logistically challenging environment of Antarctica demands a resourceful use of a single instrument recording ground motions in three dimensions. In this study, we build on a single-receiver method, namely the teleseismic coda autocorrelation, for studying glacial structures, and obtain the ratio between compressional and shear wave speeds, known as the P-over-S wave-speed ratio, or ratio, in the whole ice sheet. As a result, we can expand the spatial distribution of such measurements to specific regions, including Antarctica's remote interior. The expanded ratio distribution generally agrees with the continental scale variation in the thermal flow from the Earth's interior, implying a possible connection with large-scale internal variation of ice sheet physical properties. Moreover, the single station method developed here could be useful in seismologists' toolbox in future missions to icy planets where instrumentation is also limited.

HUIYUN DENG

Towards daily mascon solutions for GRACE-FO using a Kalman filter

The temporal resolution of GRACE-FO gravity solutions is generally monthly, obtained by accumulating about thirty days of normal equations. Averaging over a month smooths away signals that change within it, such as flood events and heavy precipitation. We are therefore solving day by day instead, using a Kalman filter so that each day's solution builds on the one before. Our filter runs in covariance form and treats each daily mascon solution as an observation, with its full variance–covariance matrix as the observation-error covariance. We checked it against the conventional stacked solution from our group's addnorm software over a 27-day window, and initially found the two disagreed badly, correlating at only 0.82. The cause turned out to be double-counting of the prior. Every daily inversion already carries its own prior, so the filter imposes that prior 27 times where addnorm imposes it once. The fix is to tighten the addnorm constraint by $\sqrt{27}$, from 10 to 1.9245. The two solutions then agree to better than one part in a million. North–south striping still dominates the daily maps. An addnorm run over the same 27 days, with the same diagonal-only prior, stripes just as badly, so the cause is the missing spatial regularisation, not the filter. Adding spatial correlation to the prior and the process noise comes next, followed by validation over the major Australian basins.

StuCon 2026 Program

PRESENTATION SESSION 3

1:30pm - 3:00pm

Yukai Hu – Seismic moment tensor inversion incorporating 3-D Earth structure uncertainty

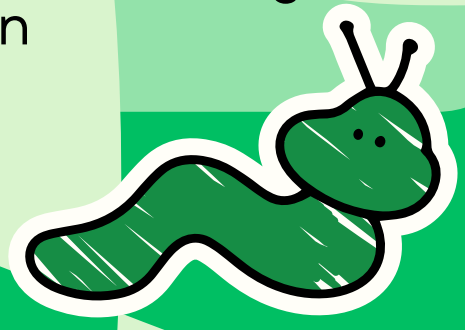
Alana Mina – One more match: TABS United vs. Sulfides FC

Eleanor Dodsworth – Significant Groundwater Recharge from Double Cyclone Event in Northern Australia

Dylan Hull – Effective capture and storage of oceanic Cu(I) using bathocuproine, a Cu(I)-specific chelator

Lluka Johns-Mead – Evolution of the niobium-tantalum mineralisation of the Mount Weld Carbonatite, Western Australia

Maya Taib – Disentangling the effect of vegetation on SWOT satellite water detection



YUKAI HU

Seismic moment tensor inversion incorporating 3-D Earth structure uncertainty

Seismic source inversion of earthquakes remains a challenge in observational seismology, largely due to imperfect representation of data noise and 3-D structural error. While integrating 3-D as opposed to 1-D velocity models to compute synthetic seismograms significantly improves waveform fitting and source characterization in tectonically complex regions, fully accounting for the uncertainty of these models remains computationally prohibitive. Specifically, although 3-D tomographic ensembles inferred from Bayesian inversions capture the full posterior distribution, the massive storage requirements make it impractical to archive and disseminate. Consequently, structural uncertainties are typically reduced to simplistic summary statistics, such as the mean and standard deviation. To overcome this barrier, we introduce an invertible neural network, Normalizing Flow (NF), to learn the continuous probability distribution of 3-D tomographic ensembles. By mapping the probability distribution of complex, high-dimensional geological structures into a tractable Gaussian latent space, we achieve a highly compressed yet lossless representation of the structural posterior. Crucially, this allows the entire ensembles to be encapsulated within the lightweight parameters (e.g., weights and biases) of the trained network, effectively resolving the storage and sharing problems. Once trained, by simply drawing random samples from the Gaussian latent space, we can instantaneously generate an infinite number of 3-D velocity models. These generated models are subsequently utilized to construct a structural covariance matrix for Bayesian seismic moment tensor inversion. As a proof of concept, we successfully validate the generative capability of our NF architecture on a 2-D Gaussian mixture model, demonstrating its ability to perfectly capture the multimodality of the parameter space. Ultimately, this leads to a better characterization of seismic sources.

ALANA MINA

Elementary, my dear Watson: A case of elemental partitioning

A signature on a painting is not a certificate of authenticity. Sherlock Holmes knew he had to dig deeper. One day, a client arrived with an inherited painting, hoping the detective could determine whether it was an original masterpiece. “Wouldn’t it be enough to analyse a small paint sample?” Watson asked. “Not quite, my dear Watson,” Sherlock replied. “We must ask a more fundamental question: were the pigments assembled under the conditions expected for the original artist?” Their composition, chemistry, distribution... they would reveal if the painting was genuine. Geochemists face a similar challenge. We never witness the magma crystallising. We only see the final masterpiece. The evidence available is the chemical record preserved in minerals. Titanite, apatite, and zircon (TAZ), like the pigments of a painting, incorporate trace elements according to the conditions of the melt formation. Together, they preserve a chemical fingerprint of equilibrium crystallisation. In this presentation, Sherlock and Watson become our guides through the investigation. Using the authentication of artwork as an analogy, we explore how the partitioning of trace elements between TAZ can be used to reconstruct crystallisation temperatures and, ultimately, identify the conditions that favour the concentration of economically important elements.

ELEANOR DODSWORTH

Significant Groundwater Recharge from Double Cyclone Event in Northern Australia

Groundwater plays a vital role in Australia, but nowhere is it as important as in the remote Northern Territory community of the Barkly Tablelands. In recent years the groundwater in the region has been depleted due to changes in water licence regulation and subsequent over pumping. However, in 2022 and 2024 the region was hit with three cyclones, two of which occurred a month apart in 2024. Following these cyclones a 1,000km wide ‘wet blob’ was detected by the GRACE-FO satellite, indicating that a significant volume of water was present in the region. In the three years since the first cyclone, the wet blob has continued to appear with only minimal dying out occurring in late 2025. Here we investigate the occurrence of the wet blob and where this significant volume of water has gone over the last three years. By combining satellite data and land surface models the total water storage has been separated into surface water, soil moisture and groundwater. Following on from this the volume of groundwater will be quantified and the lateral flow of water in the region will be mapped.

DYLAN HULL

Effective capture and storage of oceanic Cu(I) using bathocuproine, a Cu(I)-specific chelator

For certain species of phytoplankton in the Fe-limited Southern Ocean, Cu can be utilized as a proxy for important processes such as photosynthesis and respiration. Previous studies involving dissolved Cu in the ocean have primarily focused on the Cu(II) oxidation state, and it was previously assumed that about 90% of Cu in the surface ocean was found in this state. However, recent studies have suggested that up to 90% of dCu in coastal and estuarine environments could be in the reduced Cu(I) oxidation state. Cu(I) can be rapidly taken up by phytoplankton due to specific Cu(I) transporters in the cell membrane, and high concentrations of Cu(I) relative to Cu(II) may create a more direct pathway for Cu to be used in essential cellular processes. While Cu(I) has been measured before, the volatile nature of Cu(I) in seawater can prevent it from being effectively measured if not done immediately. With the time-intensive nature of open ocean research in mind, I intend to develop a method for effectively capturing and storing Cu(I) in order to measure Cu(I) concentrations from samples taken at sea and during cell culturing experiments. This study measures the capture of Cu(I) on C18 columns using a combination of Cu(I) and Cu(II) binding ligands, bathocuproine and EDTA, respectively. The relative concentrations of bathocuproine, EDTA, Cu(I), and ascorbic acid, a reducing agent, were also adjusted to determine each compound's effect on the capacity to measure the Cu(I) introduced to the column. Bathocuproine has been shown to be a more effective chelator of Cu(I) in the absence of EDTA at high concentrations of Cu(I). A >5x excess of bathocuproine to Cu(I) is necessary to prevent oxidation to Cu(II). More experiments are planned to explore increasing the measured yield, the stability of the bathocuproine-Cu(I) complex over time, and how the reagents capture lower concentrations in the 1-3 nM range, similar to expected concentrations in seawater.

LLUKAS JOHNS-MEAD

Evolution of the niobium-tantalum mineralisation of the Mount Weld Carbonatite, Western Australia

Niobium (Nb) and tantalum (Ta) are critical minerals, used in steel, superalloys, super conductors and capacitors – essential for modern technologies. Nearly 90% of global Nb production and 95% of reserves are in Brazil. Carbonatites and their supergene derivatives are the source of 99% of the world's Nb, found in the mineral pyrochlore. In contrast, most Ta is sourced from rare metal pegmatites and about 80% of production comes from three countries in Africa, with reserves in China, Australia, and Brazil. As their production is geographically limited, both metals have potential geopolitical risks to their respective supply chains. The Mount Weld carbonatite, Western Australia, is renowned for its worldclass rare earth element deposit, but also hosts significant Nb and Ta deposits, which are under studied and unexploited. The 2.06 Ga year old carbonatite is concentrically zoned with a magnesio- to ferro- carbonatite core, surrounded by an outer-ring of calcio-carbonatite. Mount Weld is now buried under a thick cover sequence of in-situ regolith and transported sediments. Pyrochlore is well documented in the carbonatite and persists through the weathered profile, with Nb2O5 and Ta2O5 grades significantly enriched relative to fresh rock. It is within the supergene profile overlying the calcio-carbonatite that the Nb-Ta deposits are found. This raises questions about surface processes driving Nb-Ta concentrations and their imprint on mineralogy. This project presents the first detailed mineralogical work on the Nb-Ta deposit at Mount Weld. We aim to characterise the Nb-Ta ore, drawing on changes between the basement and supergene rock to understand the role of surface processes in deposit formation and concentration. Initial petrography using SEM TIMA mineral mapping has shown an increase in the diversity of Nb-bearing phases present in the weathered profile, compared to the fresh carbonatite. In the fresh rock, Nb is hosted in pyrochlore and Fe-columbite, although these are both present in the supergene material, Nb is also seen in Fe-oxides and hydroxides, ilmenorutile and occasionally Nb-Fe silicates. Additionally, there are significant changes to the pyrochlore found through the weathered profile, both texturally and compositionally, quantified using electron probe microanalysis. This shows the alteration and potential decomposition of pyrochlore (and subsequent Nb redistribution) at Mount Weld under surface conditions. Understanding the evolution of this deposit has implications for resource exploration and processing, as well as building the global knowledge of carbonatites-hosted Nb-Ta deposits.

MAYA TAIB

Disentangling the effect of vegetation on SWOT satellite water detection

Wetlands are critical ecosystems that are extremely vulnerable to changing water flows. Monitoring the extent, depth and frequency of water within wetlands is therefore important for preserving their biodiversity and ecological functioning. The Surface Water and Ocean Topography (SWOT) satellite mission can aid with this, using Ka-band radar interferometry to measure water levels across wetlands every ~11-21 days with high accuracy. However, previous work has shown that the ability of SWOT to detect water may be affected by vegetation, constraining its use in wetland environments. We investigate this effect by first simulating water extents across vegetated farm dams using a Digital Elevation Model and highly accurate SWOT water height estimates. We then validate these simulated water extents against independent Sentinel-2 satellite observations. By comparing the SWOT water extents against the simulations, we found that missed SWOT water detections were caused by insufficient coherent power, which was due, in some cases, to increased vegetation heights. However, other parameters such as vegetation density and wind-induced effects likely also impacted the SWOT water detection. While further evaluations of these effects are needed, our study provides a valuable test case for elucidating the constraints on SWOT water detection in vegetated environments.

End of Program

Please do not forget to cast your votes to award the best presenter!