

ORE SOLUTIONS

NEWSLETTER OF **CODES** CENTRE FOR ORE DEPOSIT AND EARTH SCIENCES

> SUMMER 2025 **No.53**

VOLCANOLOGY VOYAGE NETS BIG RESEARCH BENEFITS



Royal assent: His Royal Highness Crown Prince Tupouto'a 'Ulukalala from the Kingdom of Tonga (centre) is flanked by dignitaries and representatives from Tonga and Australia with the RV *Investigator* berthed at Nuku'alofa, Tonga, behind them. The Vice Chancellor of Tonga National University, Giulio Masasso Tu'ikolongahau Pāunga, is second from right; Associate Professor Rebecca Carey, is fourth from right; sixth from right is Captain of the *Investigator*, Richard Hewson (bearded and wearing civvies). Australia's Deputy High Commissioner to Tonga, Erin Gleeson, is standing between the Captain and the Crown Prince; behind her is Margot Hind (Voyage Manager from the CSIRO). On the other side of the Crown Prince is the Minister for Lands and Natural Resources, Dr 'Uhilamoelangi Fasi. And Folauphola Saione Helina Latuila from Tonga Geological Services is third from left in this group. (Photo: CSIRO–Fraser Johnston)

On 10 August the RV *Investigator* set out from Hobart to Tonga to examine the aftermath of the world's largest volcanic eruption in more than a hundred years – with CODES/Earth Sciences Associate Professor Rebecca Carey on board as Chief Scientist. Here she reports on discoveries from the IN2025_V05 Voyage: 'Eruption, seafloor recovery, and ongoing change at Hunga Volcano, Tonga', which will provide key knowledge of eruption and volcanic clast transport processes, and critical data essential for volcanic, tsunami and submarine cable assessment.

IN THIS ISSUE

Honours: the class of 2025	4
Research updates	8
Master of Economic Geology	9
Where are they now? Darryl Clark	12
Obituary: Al Cuison	14
Obituary: Clive Burrett	25

FROM THE DIRECTOR

Professor David Cooke highlights the many achievements for CODES in the past few months, including delivery of four Masters units, two important CODES-led field trips, and major research milestones. He also acknowledges the passing of our much-loved colleague Al Cuison, whose obituary appears on page 14.

➔
P28

CODES CONTACTS

CODES DIRECTOR
David Cooke
Ph: +61 3 6226 7605
d.cooke@utas.edu.au

MANAGER, CODES Analytical Laboratories
Jeffrey Oalmann
Ph: +61 6226 1775
Jeffrey.Oalmann@utas.edu.au
CODES Analytical Laboratories:
CODES.Labs@utas.edu.au

LEADERS, PROGRAM 1
Ore Deposits and Mineral Exploration
Mike Baker and Lejun Zhang
Ph: +61 3 6226 7210/7211
Michael.Baker@utas.edu.au
Lejun.Zhang@utas.edu.au

LEADERS, PROGRAM 2
Geometallurgy and Geoenvironment
Angela Escolme and Owen Missen
Ph: +61 3 6226 2664/7620
angela.escolme@utas.edu.au
Owen.Missen@utas.edu.au

LEADERS, PROGRAM 3
Sedimentation, Tectonics and Earth Evolution
Robert Scott and Jeff Steadman
Ph: +61 3 6226 2786/5554
Robert.Scott@utas.edu.au
Jeffrey.Steadman@utas.edu.au

LEADERS, PROGRAM 4
Magmatic and Volcanic Processes
Rebecca Carey and Martin Jutzeler
Ph: +61 3 6226 2987/2406
Rebecca.Carey@utas.edu.au
Martin.Jutzeler@utas.edu.au

LEADERS, PROGRAM 5
Analytical Research
Ivan Belousov and Jeffrey Oalmann
Ph: +61 3 6226 7489/1775
Ivan.Belousov@utas.edu.au
Jeffrey.Oalmann@utas.edu.au

LEADERS, PROGRAM 6
Geophysics and Computational Geosciences
Matt Cracknell and Paula Montoya
Ph: +61 3 6226 2481/0491 978 404
M.J.Cracknell@utas.edu.au
Paula.MontoyaLopera@utas.edu.au

NEWSLETTER EDITOR
Caroline Mordaunt
caroline.mordaunt@utas.edu.au

CODES – Centre for Ore Deposit
and Earth Sciences
University of Tasmania
PO Box 807, Sandy Bay,
Tasmania 7006, Australia
Ph: +61 3 6226 2472
utas.edu.au/codes
CODES.info@utas.edu.au

CONTINUED FROM PREVIOUS PAGE



Media monitoring: The research voyage to Tonga was extensively covered by several news outlets; here Rebecca talks to an ABC TV News host live from Hobart in late September in her role as Chief Scientist on board the RV *Investigator*.

The IN2025_V05 voyage aboard Australia’s RV *Investigator* has wrapped up a highly successful 54-day mission in the Kingdom of Tonga, revealing new discoveries about the 2022 Hunga Tonga–Hunga Ha’apai eruption which was the most powerful volcanic event on Earth in more than a century.

Funded through a \$7.7-million investment by the CSIRO Marine National Facility (MNF), the voyage brought together scientists from the University of Tasmania (including CODES and IMAS), Tonga Geological Services, NIWA, CSIRO and collaborators from the National Oceanography Centre (UK), University of Rhode Island, Vanderbilt University, UC Berkeley, San José State University, University of Auckland, Auckland University of Technology, University of the South Pacific, James Cook University, University of Otago and Fiji’s Social Empowerment and Education Programme. There were 22 researchers on board.

Working across the volcanic edifice and surrounding basins, the team combined multibeam mapping, seismic profiling, sediment coring, rock dredging and deep-towed camera surveys to image and sample the seafloor. They found clear evidence of active hydrothermal venting, turbid water layers and recent slope failures along the caldera walls. Sediment cores

showed that thick eruption deposits from 2022 are still on the move, being funnelled into deeper basins. Seafloor marine life remains relatively rare in the eruption-impacted region; however, life inside the caldera was richer and more diverse than outside it, likely fuelled by vent activity.

We were honoured to host a distinguished group of guests onboard the RV *Investigator*, including His Excellency Brek Batley, Australian High Commissioner to Tonga, and Deputy High Commissioner Erin Gleeson. The delegation also included His Royal Highness Crown Prince Tupouto’a ‘Ulukalala, Dr ‘Uhilamoelangi Fasi, Tonga’s Minister for Lands and Natural Resources, and Dr Giulio Masasso Tu’ikolongahau Pāunga, Vice-Chancellor of Tonga National University, along with senior government officials and representatives from Tonga Geological Services. Their visit underscored the strength of the partnership between Australia and the Kingdom of Tonga, and the shared commitment to advancing science, resilience and regional collaboration through the IN2025_V05 voyage.

The UTAS/IMAS team included Co-Chief Scientist Dr Jodi Fox, Dr Martin Jutzeler, Associate Professor Vanessa Lucieer and Dr Peter Harris, with PhD student Shannon Frey and undergraduates Ellyse Noy, George Hamaty and Tia Ewen gaining at-sea experience.

The voyage featured across SBS World News, ABC News 24, ABC Hobart and *The Mercury*, as well as New Zealand and Tongan media outlets. With vast data sets now being analysed under Rebecca Carey’s ARC Future Fellowship, the next phase will focus on understanding ongoing seafloor change and building capacity through Australia Awards-funded training for emerging Tongan and Southwest Pacific scientists.

As a result of this voyage, we now have a clearer understanding of the scale and magnitude of the 2022 Hunga volcanic eruption. The data collected enable us to calculate key eruption parameters critical for numerical and experimental modelling of this globally significant event.

Half of the on-board research team were students, and we also hosted 50 Year 11–12 Tongan STEM students, building local capacity and inspiring the next generation of marine scientists in Tonga. The voyage has positioned us to deliver critical data for volcanic, tsunamis and submarine cable hazard assessments.



On the high seas (L–R): Associate Professor Rebecca Carey, CODES PhD student Shannon Frey and Dr Martin Jutzeler on the deck of the RV *Investigator* with Tofua volcano in the background. (Photo: CSIRO–Fraser Johnston)

CENTRE FOR ORE DEPOSIT AND EARTH SCIENCES REVIEW 2025

CODES UNIVERSITY OF TASMANIA

Centre for Ore Deposit and Earth Sciences Review 2025

2 December 2025, 9 am – 5 pm

Join us for a day of cutting-edge geoscience, collaborative discussion and connection

In-person at the University of Tasmania
Sandy Bay Campus, Hobart
and online via Teams

Please register via this link
[CODES Review 2025 | Registration](#)

Access online meeting
[CODES Review 2025 | Teams](#)

For more information contact CODES.info@utas.edu.au

THE SCHEDULE FOR THE REVIEW:

- 09:00 – Introduction
- 09:15 – Research group highlights – Part 1
- 11:00 – Morning tea poster session
- 11:30 – Research group highlights – Part 2
- 13:15 – Lunch break
- 14:30 – Teaching and Learning
- 15:30 – Afternoon tea poster session
- 16:00 – New projects, discussion and close
- 17:00 – End

HONOURS: THE CLASS OF 2025

Our Honours student numbers have begun to climb once more and we outline here the research projects for the seven students in our 2025 cohort, two being mid-year starters. They have undertaken a large range of projects – from research into established deposits in Australia to projects involving China, Argentina and North Africa, and two marine-based projects: one in the Eastern Coral Sea and one northwest of Tonga.



MITCHELL HARDIE

Supervisors: Yamila Cajal, David Cooke, Lejun Zhang; Jonathon Hoye, Krista Sutton (both Evolution Mining)

Project title: *Geology, alteration and evolution of the E28NE Cu-Au deposit, Northparkes District, NSW: Controls on high-grade mineralization*

Funding: Evolution Mining

The E28NE deposit is a copper-gold (Cu-Au) porphyry deposit located in the Northparkes District, in the Macquarie Arc, central western New South Wales. Recent drilling has intersected high-grade copper mineralisation within quartz veins and breccias at E28NE that is atypical of other Northparkes porphyry systems. My project's aim was to characterise the different magmatic-hydrothermal events that formed the E28NE Cu-Au deposit, to establish the main controls on high-grade mineralisation. This aim was achieved by four weeks of graphic core logging and sampling in the field, as well as analytical work conducted at CODES. The analytical techniques included apatite and zircon U-Pb dating, SWIR (Short-wave infrared)



Angelica Matusiewicz is seen here bagging core samples in the core shed at the Dongguashan mine site, Tongling, Anhui Province, China, during fieldwork for her CODES Honours project in June 2025, which she undertook with her supervisor, Professor David Cooke.

analysis, reflected light microscopy, whole-rock geochemical analysis, SEM (scanning electron microscopy) and AMICS (Automated Mineral Identification and Characterisation System). The outcome of this project will be to improve the understanding of the geology, alteration and mineralisation of E28NE to optimise future mine planning and development for the planned commencement of mining operations in 2026.

"I am so grateful to have been able to study at CODES alongside my fellow students and with such knowledgeable supervisors. During my Honours project, I have learnt about myself and geology, and CODES has equipped me with the skills I needed to tackle any challenge I faced."



ANGELICA MATUREWICZ

Supervisors: Lejun Zhang, David Cooke, Francisco Testa

Project title: *Geological, geochemical characteristics of magnesian skarn in the Dongguashan skarn-porphyry Cu-Au ($\pm$ Mo) deposit in Eastern China: Implications for ore genesis and mineral exploration*

Funding: CODES

The Dongguashan Cu-Au porphyry-skarn-stratabound deposit is located in the Tongling district of Eastern China, in the Middle-Lower Yangtze River Valley Metallogenic Belt (MLYRB), a metallogenic belt renowned for its polymetallic (Cu-Fe-S-Au-Mo) mineralisation. Dongguashan is one of the largest known deposits in the district and has been mined since 1976. It contains > 1.6 Mt of copper and ~60 t of gold, predominantly in

skarn ore zones. A recently recognised Mg-skarn, rare in Cu-Au systems, is emerging as an important contributor to mineralisation at Dongguashan. However, the detailed characteristics of the Mg-skarns and their formation are poorly understood. This project aims to address that gap by providing a detailed characterisation of the Mg-skarns at Dongguashan, constraining their genesis using mineralogical and geochemical methods, and discussing the implications for future mineral exploration. Chinese collaborators on this project are Professor Taofa Zhou and Professor Yu Fan from Hefei University of Technology.

Doing fieldwork in China was an experience I won't ever forget! Working in 35-degree heat was definitely a challenge but something I would do again in a heartbeat. Having not travelled to China before, being immersed in the culture in every way is something I would recommend to anyone. I am thankful to also be a part of the SEG Student Chapter group that travelled to China, the friendships and connections I made with the attendees and the people we met was incredible.

"My time at UTAS and CODES has been amazing. Never would I have thought I would come out of my undergraduate degree and feel like I'm equipped to handle the real world of science! I would recommend anyone interested in geology to find some excuse to come to Tasmania and study here, the CODES community here is great!"

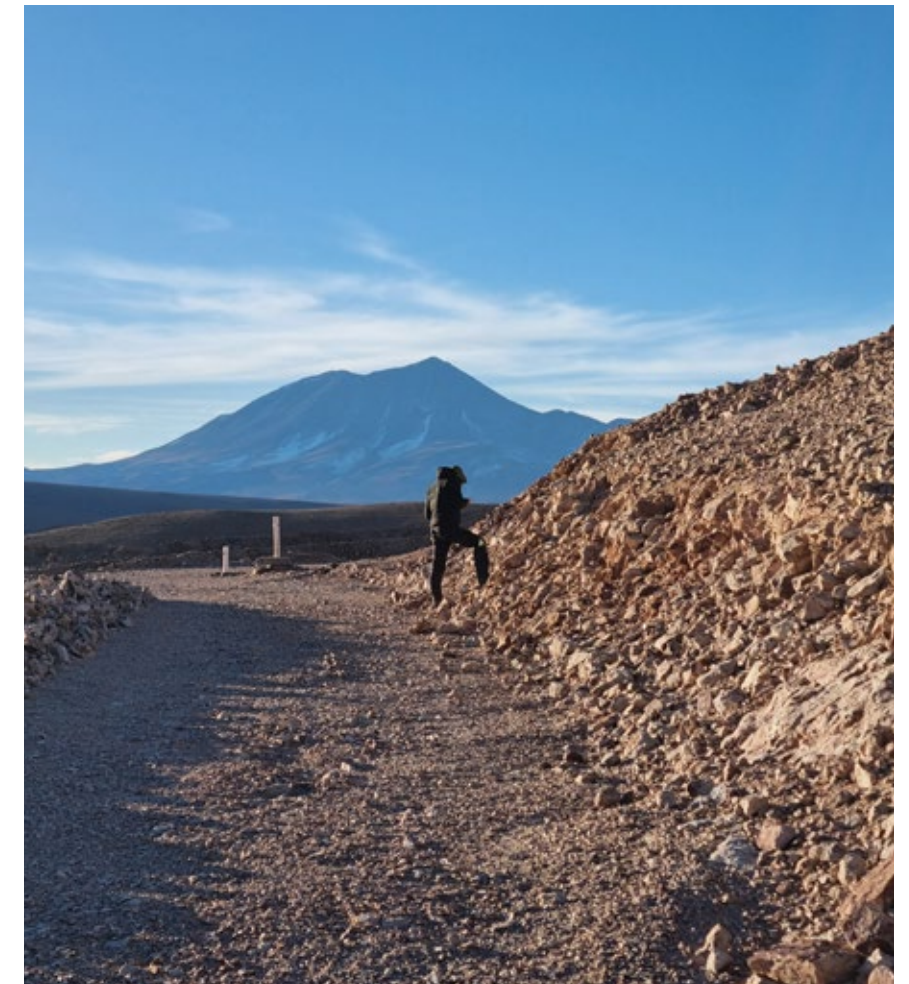


TOM MCAULEY

Supervisors: Lejun Zhang, David Cooke, Angela Escolme; Federico Cernuschi (FQM)

Project title: *Gold paragenesis and residence in sulfides and oxides at Taca Taca Bajo, Argentina*

Funding: First Quantum Minerals, CODES



CODES Honours student Tom McAuley pictured at the Taca Taca Bajo world-class Cu-Mo-Au porphyry deposit in the high desert of northwest Argentina while doing fieldwork in June 2025.

Taca Taca Bajo is a world-class Cu-Mo-Au porphyry deposit in the high desert of northwest Argentina. The deposit itself has a published resource of 2203 Mt at 0.57% Cu-eq. The deposit is hosted in the Taca Taca Batholith and bordered by Chile and volcanic sequences to the west and one of Argentina's largest salt lakes, Salar de Arizaro, to the east.

While the Cu and Mo resources are well understood, the Au is less well understood. As Taca Taca Bajo edges closer to development, a better understanding of how the Au is hosted, and any opportunities that may bring, become important factors.

This project aims to characterise lithological and alteration domains within the deposit and the gold deportment within those domains. AMICS mineral maps will be the primary analysis technique with RAMAN spectroscopy used to characterise

polymorphs – particularly Fe-oxides. FT-NIR and SWIR spectroscopy, SEM-bright-search and whole-rock assays of potential hydrothermal features will also play an important role in characterising these domains.

Fieldwork was completed in June this year, with two weeks of logging holes along a central cross-section and consulting with FQM geologists, followed by five days on site at Taca Taca. The project is scheduled to be completed in mid-April 2026.

"I first ran into CODES while working on a gold project in Indonesia when some samples were sent to Hobart of all places for some LA-ICP-MS work. A few years later now, I understand why. My time at CODES has been an amazing journey of learning, new friends and personal growth surrounded by an extraordinary group of knowledgeable and passionate academics."



This is one of CODES Honours student Mitchell Hardie's favourite samples from his project on the geology, alteration and evolution of the E28NE Cu-Au deposit, Northparkes District, NSW: monzodiorite containing a large quartz vein with bornite.



ELLYSE NOY

Supervisors: Martin Jutzeler, Rebecca Carey

Project title: Volcanic stratigraphy and submarine eruption processes in the Izu rear arc; Unit II at U1437D, IODP 350

Funding: CODES

Throughout geological history, most of Earth's volcanism has occurred underwater – along mid-ocean ridges, subduction zones, oceanic plateaus and intraplate seamounts. Despite accounting for ~85% of global volcanic activity, submarine volcanic sequences remain less well understood due to limited direct observation and alteration that obscures original textures and depositional features.

My research examines the volcanic stratigraphy and evolution of Unit II from Hole U1437D, recovered during the 2015 IODP Expedition 350 in the Izu-Bonin rear arc, to investigate eruption style, transport processes and depositional water depth. The study focuses on Unit II, which occurs between 682.12 and 726.5 m below the seafloor and was deposited around 4.3–4.4 Ma. Its distinct lithofacies – pumice lapilli-rich tuffs with minimal tuffaceous mudstone and no mafic material – provide a unique opportunity to constrain the dynamics of silicic submarine volcanism in the Izu-Bonin rear arc. My project has focused on analysing the vesicularity of the bubbles present in the pumice along with the geochemical trends within the glass shards and their volatile content to constrain water depth at time of eruption and determine eruption style.

"Throughout my Honours year, I've gained a deep appreciation for submarine volcanology and geological research. I'm incredibly grateful to my



CODES Honours student Ellyse Noy (centre) on board the RV *Investigator* in September 2025 during the 54-day voyage to the Hunga Tonga volcano; she is pictured with fellow scientists, receiving and processing freshly retrieved multi-core samples from the seafloor. Volcanoes Tofu and Kao are visible in the background.

supervisors and the UTAS and CODES community for their guidance, support, and opportunities that strengthened my skills and passion for studying underwater volcanic processes."



GABRIELLE O'TOOLE

Supervisors: Francisco Testa, Lejun Zhang

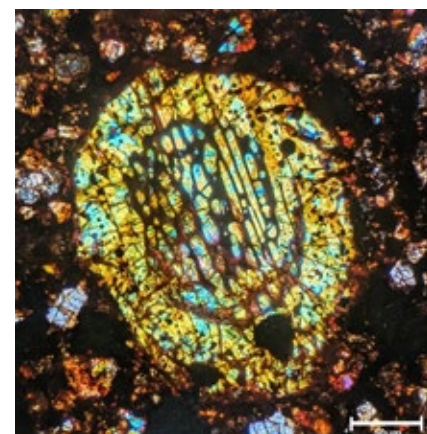
Project title: Unveiling the origins of chondrules: A mineralogical, geochemical and geochronological study of chondrites from NW Africa

Funding: CODES

Chondrites are the timekeepers of our solar system. Their history began over 4.5 billion years ago with the formation of calcium aluminium inclusions (CAIs) and amoeboid olivine aggregates (AOAs). These are among the earliest refractory materials to condense from the solar nebula. Soon after, millimetre-sized molten droplets called chondrules formed, cooling and accreting in space to create stunning textures unique to extraterrestrial material such as barred

olivine. Through complex processes CAIs, AOAs and chondrules accreted into chondrites which coalesced into C-type asteroids. These were later fragmented into meteoroids, some of which survived atmospheric entry to become meteorites.

Ordinary chondrites make up 80–85% of observed falls whilst carbonaceous chondrites are rare (<5% falls). The latter are rich in refractory inclusions (e.g., CAIs) and volatile bearing material. These characteristics offer critical insights into early solar system conditions and potentially the origins of water and life on Earth.



Is this a stained-glass window or is it barred olivine with igneous rim surrounded by mesostasis from ordinary chondrite NWA25FT10? This is a chondrule from the chondrite which formed the research topic for CODES Honours student Gabrielle O'Toole.

As part of this Honours project four ordinary chondrites were studied; unexpectedly, one was identified as a carbonaceous chondrite. Detailed analyses of this rare meteorite, together with three ordinary chondrites, aim to unravel the origin and evolution of their components, offering new insights into the dynamic processes that shaped the earliest solid matter in our solar system.

"I feel so grateful to have studied at CODES. I have enjoyed the rocks, the people and my project. I feel as though I have made lifelong friends and connections and possibly found one of my greatest loves...geology!!"



WILLIAM SINCLAIR

Supervisors: Rebecca Carey, Sebastien Meffre

Project title: The evolution of the Mellish Rise and Louisiade Plateau, Eastern Coral Sea

Funding: ARC Discovery Grant

The Eastern Coral Sea is a little understood area within the SW Pacific. Cretaceous to Miocene convergent and extensional tectonics formed a complex puzzle of submerged continental fragments, seamounts, hotspots-related island chains and relic island arcs surrounded by back arc and rift basins. This project focused on the rocks recovered from three dredges from the



William Sinclair, whose Honours project examines the Eastern Coral Sea, is seen here taking notes on Triassic volcanoclastic sandstones at Bourake Wharf, New Caledonia, during a field trip to that country in mid-2025.

Australian research ship, the *Investigator* (IN2019_V04), aiming to make better tectonic models for this area.

Geochemical, geochronological and biostratigraphic methods were used to show that the igneous rocks from these dredges formed on the sea floor in the middle Eocene and were then covered by quaternary sedimentary rocks. Amphibolite-facies metamorphic clasts from a conglomerate from the northern Louisiade Plateau were dated to 46 Ma using both Ar-Ar (amphibole) and U-Pb (titanite) methods, constraining the low-P high-T metamorphism of the Louisiade Ophiolite. These findings were then modelled in the GPlates interactive tectonic plate modelling software to provide an updated model for the tectonic evolution of the Eastern Coral Sea and the wider SW Pacific region.

"Choosing to move to UTAS for my Honours was one of the best decisions I could have made. I have been immediately surrounded by kind and welcoming people, incredibly supportive supervisors, and passionate geoscientists all around. I finish at UTAS feeling proud to be a part of this wonderful community!"



ANTHONY TAI

Supervisors: Francisco Testa, Lejun Zhang, Noel White; Paul Cromie (Auspin/Pajingo Gold Mine)

Project title: Carbonate species in and around low sulfidation epithermal veins at Pajingo, QLD: Geochemistry, geochronology, and exploration implications

Funding: Auspin/Pajingo Gold Mine

The Pajingo Gold Mine in north Queensland's Drummond Basin is a world-class low-sulfidation epithermal deposit, famous for its spectacular quartz-carbonate veins showing classic textures such as crustiform-colloform banding, ginguero, cockade breccias



Honours student Anthony Tai in the core shed at Pajingo Gold Mine holding an interesting sample of brecciated andesite cut by a carbonate-adularia vein, from the Starlight prospect, Pajingo epithermal system.

and dogtooth spar. Past studies have focused mainly on silicate and sulfide minerals; this Honours project breaks new ground by investigating the carbonate mineral assemblage (e.g., calcite, ankerite, dolomite and siderite) in previously unstudied targets. New U-Pb carbonate ages reveal events that fall outside the known low-sulfidation epithermal episodes, challenging current models at Pajingo.

Through detailed work on paragenesis, isotopic and geochemical signatures, and spectral properties, this research aims to determine whether carbonate minerals can act as vectors to mineralisation. By generating a robust new data set and interpretation, this study will refine the understanding of epithermal processes at Pajingo and may help develop innovative exploration tools for discovering similar systems in underexplored regions.

"I enjoy a good challenge, which was what my Honours degree brought me. My supervisors and CODES staff gave me an exciting project while providing generous support. Meanwhile, through field trips, courses and an exchange program in Beijing, I have developed crucial skills as a geologist but also made friendships around Australia and the world – definitely the icing on the cake!"

SEDIMENT-HOSTED CU-CO DEPOSITS: DEVELOPING NEW MINERAL CHEMISTRY EXPLORATION TOOLS – A NEW CODES RESEARCH INITIATIVE

Lead researcher on this project, Dr Sheree Armistead, reports:

The Sed Cu project is moving full steam ahead following a fantastic response at the SEG 2025 Conference in Brisbane, where the team had many productive discussions with current and prospective collaborators. These conversations have now translated into strong industry support, with enough partners secured to officially launch the project.

The Sed Cu Project aims to develop new tools and data sets to better understand the formation and exploration potential of sediment-hosted copper systems.

An online planning meeting will be held on **Tuesday 25 November**, bringing together all partners to refine project priorities and identify key study sites. This will set the stage for a more detailed in-person start-up meeting early in 2026.

With strong engagement from industry, the project is expected to commence in **Q1 2026**. The team is excited to begin this next phase of collaborative research that will advance our understanding of sediment-hosted copper systems and deliver outcomes directly applicable to exploration across Australia and globally.

Industry partners interested in collaborating are encouraged to reach out to Dr Sheree Armistead (sheree.armistead@utas.edu.au) or Professor David Cooke (d.cooke@utas.edu.au) for further information.

ScopelR IS MOVING TO THE NEXT LEVEL: INDUSTRY INPUT NOW INVITED

Associate Professor Lejun Zhang reports on progress:

ScopelR is a next-generation spectral analysis platform developed at the University of Tasmania through a collaboration between CODES, the Central Science Laboratory (CSL) and InVent. ScopelR delivers rapid, *quantitative* mineralogy and chemistry for the mining industry through the ScopelR Portable and ScopelR Lab. By combining high-resolution IR spectroscopy with predictive models calibrated on a world-class mineral data set, ScopelR turns spectra into decision-ready numbers.

Building on ScopelR, CODES and CSL's state-of-the-art laboratories, the research team at CODES is launching a new research project to develop end-to-end tools, workflows and models for:



The ScopelR project has been developed by CODES Associate Professor Lejun Zhang (right) and Dr Thomas Rodemann from the CSL, who are pictured here with Dr Adele Seymon from Deep Green R&D Solutions at the CODES booth during the SEG Conference, held in Brisbane in September.

- (1) next-generation, high-resolution orebody characterisation;
- (2) an innovative toolbox for greenfields and brownfields exploration; and
- (3) evaluation and characterisation of tailings and waste rocks.

The outcomes will enable industry partners to develop site-specific solutions for cost-effective, timely decision-making across the mining value chain, delivering high-resolution

quantitative mineralogy and chemistry from exploration through to processing and closure.

We invite industry partners to participate as sponsors, with a planned kick-off in **mid-2026**.

For more detailed information, please contact: Dr Adele Seymon (adele@deepgreensolutions.com.au), Associate Professor Lejun Zhang (Lejun.Zhang@utas.edu.au) or Professor David Cooke (d.cooke@utas.edu.au)

MOUNTAIN HIGH: CODES IN SOUTH AMERICA

Field trip participants in the Atacama desert, northern Chile, with the 6,150-m-high San Pedro stratovolcano in the background. San Pedro is one of the highest active volcanoes in the world.



Professor David Cooke reports on the recent highly successful Masters course held in Chile and Peru, attended by several industry geologists as well as our Masters students.

ORES IN MAGMATIC ARCS – SOUTH AMERICA (KEA707)

The tenth version of CODES' Ores in Magmatic Arcs – South America (KEA707) was delivered as part of our Master of Economic Geology program in October 2025. A cohort of industry geologists also participated in the field excursion, with many of these participants now keen to enrol in the Masters degree after learning the educational benefits of the program. In addition to the KEA707 cohort, students enrolled in KEA724 (thesis project – part A) also participated in the course to conduct field research for their major report.

The field program involved one week of site visits in Chile, and a second week in Peru. The trip started with a Central Chile geological transect, led once again by Professor José Piquer from Universidad Austral, which showcased the amazing geology of the Central Andes and the geological setting of some of the world's largest porphyry deposits. José also led the group on a transect across the Charaon intermediate sulfidation epithermal

vein swarm in Central Chile. The mine site visits on the Chilean leg were ably coordinated by Yamila Cajal, who arranged, coordinated and co-led site visits to several of the world's largest porphyry copper deposits, including El Teniente, Rio Blanco-Los Bronces, Chuquicamata, Radomiro Tomic and El Abra.

A unique aspect of this year's excursion was our visit to the highly controversial El Laco iron deposit, which crops out on the flanks of a stratovolcano at 5,000 m in the northern Chilean Andes. Our visit to El Laco was led by José Tomás Ovalle from Universidad Mayor, Santiago, who organised an amazing visit hosted by geologists from CMP. A huge thank you to CODELCO, Freeport and CMP geologists for their time and efforts in hosting our site visits to these giant copper-molybdenum and iron mines.

Week 2 was based in central and northern Peru, where CODES PhD student Victor Torres organised and coordinated site visits to the Cerro Lindo VHMS, Cerro Corona porphyry Cu-Au and Antikori, Tanta Huatay and La Zanja high sulfidation epithermal deposits. Associate Professor Lejun Zhang joined week 2 of the trip to help lead the high sulfidation epithermal component. The Peruvian site visits were hosted by Nexa Resources, Gold Fields, Regulus Resources, and Buenaventura, and we thank the geologists from each company for their fantastic efforts in sharing their geological understanding of these spectacular deposits and their exploration footprints.

Huge thanks are owed to Yamila Cajal, Victor Torres, Helen Scott, Jaime Osorio and Olivia Parker for all their work in making this year's excursion the most successful version so far.



Trip leaders (from left) David Cooke, Yamila Cajal, José Tomás Ovalle and Victor Torres at El Laco magnetite deposit, northern Chile.

TWO RECENT MASTERS COURSES TICKED ALL THE BOXES FOR ECONOMIC GEOLOGISTS

GEODATA ANALYTICS (KEA713) Dr Matt Cracknell, leader of the Geodata courses at CODES, reflects on the success of this year's course:

The KEA713 Geodata Analytics Masters of Economic Geology unit continues to lead training in mineral exploration and ore deposit characterisation through innovative geoscience data analysis and modelling education. Delivered fully online, this three-month program empowers geologists to master database management, statistical analysis, machine learning, and automated workflows for multivariate geoscience data modelling. Participants gain hands-on experience in designing reproducible analytics pipelines and communicating insights effectively.

In 2025, KEA713 has a true global reach, engaging around 20 Masters students, 10 external industry professionals, and several CODES PhD candidates

across most continents. This diverse cohort fosters collaboration between academia and industry, training the next generation of geoscientists to solve complex geological challenges with cutting-edge tools and methods.

GEOMETALLURGY (KEA711)

Course coordinator Dr Angela Escolme talks up this year's Geomet offering:

The 2025 delivery of KEA711 Geometallurgy has garnered significant industry interest and brought in a record number of attendees from both the Masters of Economic Geology program and those taking the course for professional development. Delivered completely online for the second time, the two-week course has reached a global audience and been more accessible to those who would have been unable to travel to Hobart – which is

something I feel is quite impactful, especially given the high calibre of speakers who have come together to contribute to the course.

The first week, delivered at the end of October, covered fundamental metallurgy and ore characterisation techniques, and the second week, to be delivered in the final week of November, will cover data analytics, predictive geometallurgical modelling, ESG, environmental geology and future developments. To augment the online delivery, virtual tours of the UTAS laboratory facilities and several mine site tours have also been included for participants to explore and consolidate their knowledge.

As well as the technical content, course participants have also had the opportunity to network with industry experts from a variety of fields who might be of assistance in their future geometallurgy endeavours!



This map (padlet: <https://padlet.com/mjcracknell/where-are-you-2lwmhld219n6a18d>) shows the locations of many of the students on the recent running of Geodata Analytics KEA713.

2026 COURSES ARE FILLING ALREADY

ADVANCED FIELD SKILLS IN ECONOMIC GEOLOGY (KEA718)

Discover your geological potential with the CODES Advanced Field Skills Masters short course, which runs from 1–14 February 2026, and experience real-world learning in Tasmania's unique geological landscape. Course co-leader Dr Mike Baker recommends the course to all potential participants:

Are you ready to take your career in the minerals industry to the next level? The Advanced Field Skills Masters short course offers a hands-on, immersive learning experience right in the heart of Tasmania's stunning field environment. This course is designed for students and professionals who want to master fundamental and advanced techniques essential for modern geological mapping and fieldwork.

Throughout the course, you'll gain invaluable skills in field-based rock and mineral identification, ensuring you're fully equipped to spot key geological features in any setting. You'll dive into fact and form surface mapping and learn Anaconda-style mapping techniques that are beneficial for minerals exploration. The program also covers structural measurement and graphic logging techniques for drill



core – skills crucial for those working with core samples or aiming to interpret complex geological structures.

There is a strong emphasis on the practical application of spectral, geochemical and remote sensing data sets. You'll learn how to harness these advanced tools to create and interpret geological maps with confidence and precision.

Whether you're looking to launch your career or seeking to upskill for greater opportunities, this course is your pathway to becoming a leader in geological fieldwork. Don't miss the chance to learn from experts and network with like-minded peers in one of Australia's most geologically interesting regions.

VOLCANOLOGY AND MINERALISATION IN VOLCANIC TERRAINS (KEA708)

Dr Martin Jutzeler will be leading the next Volcanology course and outlines here what it holds in store for those lucky enough to secure a place on the trip:

The next biennial Master of Economic Geology field course, KEA708 Volcanology and Mineralisation in Volcanic Terrains, will take place on **4–18 March 2026**. The course will be held in two main locations, taking advantage of the beautiful scenery and unaltered volcanic deposits in the North Island of New Zealand, and continuing on to the renowned mineralised Mt Read Volcanics in western Tasmania.

The trip includes climbing several volcanoes to get a real perspective of their size and power, visiting active geothermal sites and their hot pools, interpretation of volcanic facies at multiple outcrops exhibiting subaerial and submarine deposits, logging cores at three mine sites, and lectures and practicals at CODES. Accompanying Dr Martin Jutzeler will be Associate Professor Lejun Zhang and Dr Rob Scott.



WHERE ARE THEY NOW?

Dr Darryl Clark completed his PhD at CODES in 2003 and has worked in a variety of roles within the mining industry before recently settling on an exploration role working for Maaden in Saudi Arabia. When he's not doing geology, he likes to camp out under the Arabian skies, or scuba dive in the Red Sea.

ARABIAN NIGHTS



DR DARRYL CLARK

Executive Vice President of Exploration & Resource Development for Maaden, in the Kingdom of Saudi Arabia

PhD completed at CODES in 2003, titled 'Geology, geochemistry and structure of the Mammoth Copper Deposit, QLD, Australia' (supervised by Professor Bruce Gemmell)

What is your current job?

I am the Executive Vice President of Exploration & Resource Development for Maaden, one of the largest mining companies, with operations primarily in the Kingdom of Saudi Arabia and headquarters in Riyadh.

What do you enjoy most about this role? When did you start? Describe a typical day for you.

I have been in this role for just over 12 months, and, in my opinion, I have the greatest job in the world! The role focuses on underpinning the growth of the mining industry in the Kingdom of Saudi Arabia by discovering and developing mineral resources. To achieve this, we are assembling a team of geoscientists and field service professionals. A typical day for me involves discussing exciting results with project geologists, checking in with other corporate functions such as Human Resources and Finance, and helping my peers on our executive team fully grasp and anticipate realising the value proposition that the discovery program represents. Today our entire exploration portfolio is focused on the Kingdom of Saudi Arabia.

On the personal side: life in the Kingdom is very enjoyable with both desert wilderness and city activities readily available. I live here with my wife and daughters, and we enjoy all aspects of a very modern city. Great education options, first-rate health care all while being well-connected to the globe with very affordable flights to anywhere in Europe. It's very easy for our relatives to come and visit with the availability of online tourist visas which are often approved within the

hour. During the cooler months the opportunities for camping trips are something we look forward to as the clear night sky lights up beautifully. At least once a month I'm down in the city of Jeddah, which is located on the Red Sea coast where we have one of our regional exploration offices that serves as a base for our projects located in the south. The fresh seafood there would make a North Queenslander green with envy as the marine life is abundant!

How did you get there? What past roles shaped your path?

With over 30 years in the resource industry, I have had the good fortune to experience many roles, ranging from early-stage exploration, feasibility studies, construction and operations to managing tailings facilities. I am amazed at how interdependent each of these phases is on the others. These phases are more like chapters of a good book, where the story becomes more compelling with each page. Understanding the interdependency of seemingly separate functions across the mining value chain allows us as geoscientists to apply our skill sets in the best way possible and continuously improve the process as we progress.

What has been your career highpoint or greatest achievement to date? What is your source of greatest satisfaction as a geologist?

Without a doubt, my time at CODES was pivotal to my career. My greatest achievement and source of satisfaction to date was while working in the uranium industry in Kazakhstan. I supported the mine geology team in improving the geological model,

leading to better mine design, reduced dilution and significantly lowered production costs. I leveraged my position to ensure that getting the geological model correct was a priority for the entire organisation. During the initial steps, we made some of the engineers cry as they came to realise the importance of getting the geological model correct was more valuable to the operation than a well-thought-out Gant chart!

What did you specialise in at CODES, and how did CODES help you get where you are? What did you enjoy most about CODES?

My thesis topic was a traditional CODES ore deposit knowledge study. Over time, I have come to realise that the research work I did at CODES taught me to ask the right questions, design methods to answer those questions, collect and quickly analyse data, and continually search for innovative ways to test and refine emerging solutions. The collaborative environment at CODES fostered the required mental space and provided the support to tackle many issues. This training and experience have been invaluable throughout my career.

How has the industry changed since you were at CODES? How do you see it developing in the future?

Since my time at CODES, the role of our mineral resources industry in helping civilisation move towards sustainability has only increased. The building blocks of our society are either grown or mined, and as the demand on the agricultural industry intensifies, the fertilisers required to support bumper harvests are resources that we mine. I am incredibly proud of that. The future is even more exciting than the past. Today, the amount of data we collect and the speed at which we can collect it seem relatively limitless. We are entering a time when our ability to study data and ask questions of it has seen a paradigm shift. We need to train our younger professionals to be curious and give them the ability and confidence to ask the right questions.



Dr Darryl Clark (second from right) pictured here with the Maaden field mapping team in the Suwaj Arc, Kingdom of Saudi Arabia.



Participating as a panellist during the Future Minerals Forum in January 2025, which was held in Riyadh, Saudi Arabia, and had over 18,000 attendees.

Words of wisdom for up-and-coming geologists graduating from CODES?

- See as many rocks and mineral systems as you can.
- Never stop learning.
- Never stop listening.
- Never stop questioning.
- Deepen your ability to collaborate and help others you work with find ways to work collaboratively.
- Become skilled at communicating effectively to non-geoscientists. If you can't explain how a mineral system formed to a child in grade 6, you will never get sustained support to execute your discovery program.

Little-known facts about you?

While I was studying at CODES in Tasmania, I picked up scuba diving and regularly enjoyed diving trips down to Eaglehawk Neck. Being located here in the Kingdom, I once again am able to enjoy diving in the Red Sea. My other passion is celebrating the weekend with good friends and family while enjoying food and music! My Spotify AI tells me that I like these songs the most:

- Kimosabe (Dope Lemon)
- Money (Pink Floyd)
- Pretty Pimpin (Kurt Vile)
- Hippies and Cowboys (Cody Jinks)

VALE AL CUISON



ALEXANDER DE VERA CUISSON

23 June 1965–24 October 2025

From the eulogy given at Al's funeral by Professor David Cooke, Director of CODES:

I was fortunate to meet Al's wife Liezl in 2004 when she was working at a mine in the Philippines. It was clear to me that Liezl was a brilliant geologist, but was frustrated about not being allowed underground. One of the very best things I have ever done was to invite her to come and do a PhD with us at CODES, where her passion for geology could be fully realised. The huge and unexpected bonus in this was that Al moved to Hobart with Liezl, and joined our team. This was a huge boon for all at CODES, and I believe this move was also a major moment and a transformational event for both Al and Liezl, creating rich new opportunities in a new land.

Al commenced work at UTAS in 2006, where he worked initially with Simon Stephens in our lapidary laboratory before eventually taking over as the manager of the facility. Al's job involved transforming rock samples collected by our geologists into materials we could use for research and teaching. It is no

exaggeration to say that Al's work was the essential foundation that enabled almost everything that our team of more than 30 staff and 100 students did each year at CODES.

Al worked as an integral part of the CODES Analytical Laboratories team for years, and they have asked that I share some of their thoughts and experiences of working with him. In his work, Al was like a rock – dependable and steadfast. He could always lighten the mood with his beaming smile. In the face of adversity, he would shrug, have a chuckle and get on with it. He was often a man of few words. A typical conversation with Al would go like this: everything ok in your part of the world Al? Yup... Need anything Al? Nope...

We've been grateful to have Al on the team for the past 19 years. Always getting things done on time and things perfectly made. He was a modern man – primary carer for the kids, school pickups, and never putting himself first.

Al had every reason to be justifiably proud of his work. We all benefited tremendously from his patient, diligent and careful crafting of our rock samples – he was a true artisan. Moreover, he was excellent in managing people in his quiet and humble way. Academics can be peculiar people – we are often highly anxious and convinced that our work is the most important thing in the world, and this could occasionally result in some of our team being quite insistent that their samples must be prepared immediately, without delay! Al invariably handled these anxious 'requests' with patience, kindness and respect. He treated everyone equally and got the job done with no fuss.

Everyone at CODES is fortunate to be blessed by having a lasting legacy left by Al.

We will always remember him and his craftsmanship, whenever we are working with the beautifully polished rocks that he prepared for us. We use

these to teach the next generations of geologists, so Al will continue to impact people's lives for many years to come.

All of us at CODES wish Liezl and the family our deepest condolences at this terrible time. Al has been taken from us all far too soon and it is tragic that he has not been permitted to enjoy a long and joyous time of self-reflection of a life well lived and an impactful legacy on both the personal and professional level. Al will remain in our thoughts and prayers forever – he is deeply and profoundly missed by all of us.

From Dr Jeff Oalmann, Manager of the CODES Analytical Laboratories:

It is with great sadness that we report the passing of Al Cuisson on 24 October 2025 after a short battle with an aggressive illness.

Al moved to Hobart from the Philippines when his wife Liezl started her PhD studies at CODES. For the past almost 20 years, he was an essential part of the CODES Analytical Laboratories' daily operations where he managed the lapidary lab, expertly cutting and polishing rocks, skilfully preparing thinnies, and keeping all the equipment in the lapidary lab running. This was all done while patiently and respectfully handling the 'urgent' requests of anxious students and researchers. Al's craftsmanship will be memorialised for many decades to come when geologists at UTAS – and all over the world – work with the rocks that he prepared. His calm demeanour, beaming smile, and playful chuckle will be missed by all of us.

Al's funeral was held on 31 October 2025 in Brisbane where he spent his last months surrounded by family. Several CODES staff members travelled up to farewell Al and show our gratitude and support to his family. We wish Liezl, April and Aaron, and their extended family, our deepest and sincere condolences at this tragic time.



Al is pictured here with his family – his wife Liezl, and his children April and Aaron – at Christmas 2024 at their home in Hobart.

THE AMBASSADOR OF PERU



In late October, the Ambassador of Peru to Australia, His Excellency Vitaliano Gallardo, visited CODES and the School of Earth Sciences, accompanied by Peruvian student Matthew Bristow. The visit highlighted CODES' longstanding research collaborations in Peru and its role in training Peruvian geoscientists through our Master of Economic Geology and PhD programs. Discussions focused on strengthening partnerships to enhance technology transfer and expand training opportunities in Peru's mining regions, where mineral exploration plays a key role in local economies. The meeting also explored new ways to deepen Peruvian engagement with CODES' world-class training programs.

The Ambassador is flanked by Professor David Cooke (left) and Professor Sebastien Meffre.

VISITING STUDENTS

On 28 October, the CODES SEG Student Chapter hosted a visit by the University of Western Australia SEG Student Chapter. The group of eight students from UWA were in Tasmania to do a field trip to the West Coast, and were also invited to attend sessions at CODES. Their packed CODES schedule included a talk by Professor David Cooke about the geology of western Tasmania, a workshop, a tour of the CODES Analytical Laboratories, speed talks by the UWA students, a trip to the MRT core shed at Mornington (with PhD student Angela Costa), and finally a karaoke session.



UWA SEG Student Chapter members with some of the students from the CODES Student Chapter pictured in the CODES rock garden.

CODES: THE LARGEST GROUP AT THE SEG!



The CODES contingent at this year's SEG conference, held in Brisbane during September, was the largest single group of geologists in attendance.

The annual Society of Economic Geologists (SEG) conference was held in Brisbane in late September – marking the first time the event has taken place in Australia since the 2015 Hobart meeting.

CODES made an impressive showing, with 28 staff and students from our research team and the CODES Analytical Laboratories forming the largest single group in attendance. With more than 1,200 delegates participating, it was particularly rewarding to see our students recognised among the best: congratulations to **Vinicius da Cruz**, who won first prize in the Best Student Speed Talk category, and **Angela Costa**, who received second prize in the Best Student Oral Presentation category.

The CODES booth was a hub of activity throughout the conference, as staff and students fielded strong interest in our PhD and Masters programs, as well as research collaboration opportunities. Associate Professor **Thomas Rodemann** from the CODES Spectroscopy Laboratory (at the CSL), also drew considerable attention with live demonstrations of ScopelR's innovative methods for constraining mineralogy from spectral data.

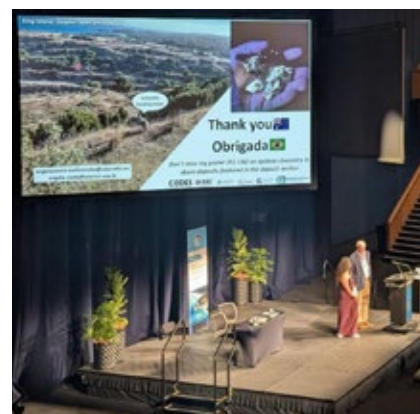
In addition to the conference itself, CODES representatives met with potential industry partners to discuss future collaborations and funding opportunities for upcoming multi-client research projects.

CODES' research impact was further highlighted through two field excursions co-led by our team. The first, a six-day pre-conference trip, explored the porphyry and epithermal deposits of the Macquarie Arc in New South Wales, showcasing three decades of CODES research supported by the local mining and exploration community. The second, a seven-day post-conference tour in Tasmania, presented outcomes from the Regional Research Collaboration research team and highlighted the island's rich endowment of critical, precious, base and ferrous metals to an international audience of 25 participants from industry, government and academia. See page 17 for further details about these trips.

The conference was a resounding success – both in showcasing CODES' global leadership in economic geology and in strengthening our connections across the international geoscience community.



CODES PhD student Vinicius da Cruz receiving his prize for winning the Student Speed Talks session at the SEG conference in September 2025.



PhD student Angela Costa from CODES took second prize in the Best Student Oral Presentation at this year's SEG conference in Brisbane.

LEADING THE FIELD: CODES SEG CONFERENCE FIELD TRIPS A BIG SUCCESS

CODES staff and PhD students were instrumental in running two of the field trips that formed part of this year's SEG Conference in Brisbane (26–29 September). Staff and PhD students from CODES led both pre- and post-conference field trips, both of which were highly praised by participants from within Australia and overseas.

PRE-CONFERENCE FIELD TRIP:

PORPHYRY AND EPITHERMAL DEPOSITS OF THE MACQUARIE ARC, NEW SOUTH WALES

20–25 September 2025

Leaders: David Cooke, Alan Wilson (GeoAqua Consultants), Jonathon Hoye (Evolution Mining), Sebastien Meffre and Jessica Askew

CODES PhD student Jessica Askew recounts here the itinerary and achievements of the six-day tour:

In September 2025, the Society of Economic Geologists (SEG) hosted a six-day industry field course across the Macquarie Arc, central New South Wales. Led by Alan Wilson, Sebastien Meffre, Jonathon Hoye, David Cooke and Jessica Askew, the trip brought together participants from industry, academia and government to examine porphyry, epithermal and skarn systems across the arc. Visits included Junction Reefs, Cadia, Northparkes, Boda-Kaiser, Cargo, Peak Hill and others, with generous access from Evolution Mining, Newmont Australia, Waratah Minerals, Magmatic Resources, LinQ Minerals and Alkane Resources. The course combined



SEG pre-conference field trip participants at Alkane's Peak Hill core logging facility, NSW.

lectures, outcrop studies and core sessions, linking deposit- to district-scale processes and highlighting the tectonic and magmatic evolution of the region. The trip strengthened collaboration between research and exploration groups and provided an invaluable professional development opportunity within one of Australia's premier metallogenic provinces.

POST-CONFERENCE FIELD TRIP:

TASMANIA'S DIVERSE ARRAY OF BASE, PRECIOUS, CRITICAL AND STRATEGIC METAL DEPOSITS

30 September–6 October 2025

Leaders: David Cooke, Owen Missen and Emrecan Yurdakul

Dr Owen Missen, one of the leaders of this trip provides a summary:

The post-SEG conference Tasmanian field trip featured a week-long expedition across Tasmania, including the east, north and west coasts for an international group featuring representatives

from universities, government and industry. We began with a visit to the Mineral Resources Tasmania core shed then travelled to see the granites and hydrothermal textures of the stunning Freycinet Peninsula. A visit to Launceston introduced the participants to our Education team who we've been working closely with during the Regional Research Collaboration project for a discussion on remote mining community strengths and challenges.

The rest of the trip was a showcase of Tasmania's world-class ore deposits and mineral localities, with visits to the ABx rare earth element clays prospect, Kara mine magnetite-scheelite mine, Renison Bell tin mine, Rosebery polymetallic mine, CopperCorp's copper and Stellar's tin exploration, the Adelaide crocoite mine and Mt Lyell mine highlighting the incredible diversity of ore deposits, mineralisation styles and critical metal potential packed into Tasmania's relatively small geographic area. Mine and core shed visits were complemented by field excursions to Granville Harbour, Trial Harbour and Serpentine Hill. We greatly appreciate the time and effort put in by all of our industry partners for hosting large groups of 25–40 people and we look forward to developing further collaborative opportunities facilitated by the trip.

Go to CODES LinkedIn page and scroll down to find further photos and commentary on these two well-attended courses: www.linkedin.com/company/codes-utas/posts/?feedView=all



SEG post-conference field trip participants at the Iron Blow lookout, Mt Lyell Cu mine, western Tasmania.

SPREADING THE WORD: CODES RESEARCHERS SHARE THEIR INSIGHTS ACROSS THE GLOBE

The past few months have seen our researchers travel to the USA, France, Iceland and various cities in Australia, sharing their research findings and networking with colleagues.

18TH SGA BIENNIAL MEETING

3–7 August 2025, Golden, Colorado, USA

PhD student José Barillas Diaz reports on this conference attended by five people from CODES:

I travelled to the USA to attend the 18TH SGA Biennial Meeting held at the Colorado School of Mines in Golden, Colorado. The CODES delegation at the meeting was led by Professor David Cooke, who gave a talk called 'Relationships of lithocaps to porphyry and epithermal deposits – an example from the Baguio district, Philippines'. There were also oral presentations from Dr Ivan Belousov, Dr Paula Montoya and PhD students Isaac Brown and myself. My presentation was titled: 'Characterizing critical metals of the atypical Avebury nickel sulfide deposit in Western Tasmania, Australia' and showcased some of the research being done for the RRC project.

11TH WORLD CONGRESS ON MECHANICAL, CHEMICAL, AND MATERIAL ENGINEERING 2025

19–21 August 2025, Paris, France

Dr Mohammad Fathi attended this conference in Paris, where he presented a paper titled 'Process optimization for scheelite flotation from a low-grade sample'. This study focused on improving recovery and grade of scheelite through reagent optimisation and operating condition adjustments; results demonstrated a significant improvement in tungsten recovery from a complex low-grade ore.

Mohammad also presented a poster ('Selective flotation of fine magnesite ore: Evaluating sodium oleate as

collector and sodium silicate as depressant') on behalf of CODES PhD student Alfreddina Appiah. This work evaluated reagent interactions in fine particle flotation to enhance magnesite selectivity against silicate gangue. Findings showed that the chosen reagent combination effectively improved separation efficiency.

AusIMM CRITICAL MINERALS 2025

2–4 September 2025, Perth

Collaborative work with Dr Angela Escolme, titled 'Unlocking the potential of tailings through geometallurgical approaches for sustainable critical mineral recovery', was presented as a poster by Dr Mohammad Fathi. This study explored strategies for extracting critical minerals from tailings using integrated geometallurgical approaches. It highlighted how mineralogical understanding and process modelling can improve recovery and support sustainable resource utilisation. The conference offered an excellent platform to discuss with industry stakeholders the importance of integrating geometallurgical science in tailings reprocessing to mitigate risks while enhancing economic returns, and present preliminary results of phytoremediation and biodiversity outcomes to the mining companies.

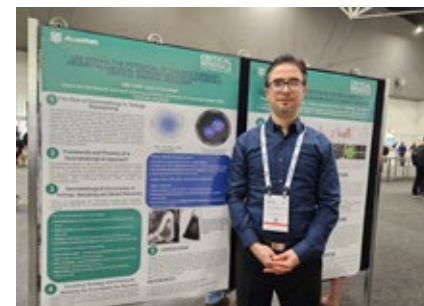
CRIRSCO MINERALS REPORTING AGM

2–5 September 2025, Perth

CRIRSCO is the Committee for Mineral Reserves International Reporting Standards. Each year CRIRSCO organises an annual meeting with their NRO representatives, and this year it was held during the AusIMM Critical Minerals Conference in Perth. Dr Paula Montoya was invited to attend this meeting as she is a Competent Person for CCRR (Colombian Mineral Resource and Reserves), a Fellow AusIMM member and on the Board



Senior Research Fellow in Mineralogy and Geochemistry Dr Ivan Belousov, PhD student Isaac Brown and Research Fellow in Economic Geology, Mineral Exploration and/or Geodata Analytics Dr Paula Montoya, take a break during the proceedings at the 18TH SGA Biennial Meeting in Golden, Colorado, USA.



Dr Mohammad Fathi pictured in Perth at the AusIMM Critical Minerals Conference with the poster he presented about his collaborative research with Dr Angela Escolme into tailings and sustainable critical minerals recovery.



Dr Ivan Belousov and Dr Paula Montoya from CODES with Hayley McGillivray, Senior Program Manager at Amira Global and organiser of the P1249 sponsor meetings, pictured on the Gold Coast while attending the Amira Exploration Managers' Conference at which Ivan gave a joint presentation with Adam Pacey from Rio Tinto.

of Advisors of the CCRR. The meeting gathers resource and reserves experts from different parts of the world to discuss global standards updates, the emerging trends in exploration, mineral resources and ore reserve

reporting, the impact of changing geopolitical environments, and practical insights and lessons learned from real-world examples.

LASI7 ICELAND

8–11 September 2025, Hveragerdi, Iceland

Dr Karin Orth attended LASI7, a small, three-day conference held amongst the steaming ground of Hveragerdi some 47 km southeast of Reykjavik, Iceland, in early September. The conference brought together people interested in subvolcanic plumbing systems focusing on laccoliths, dykes and sills. Two days of talks and posters were broken up with a one-day field trip to the Reykjanes Peninsula where delegates were able to visit some of the newly formed lavas erupted in the area over the past four years.

Karin presented her work on the Ti-V potential of the Kimberley Hart Dolerite, part of the Hart-Carson Large Igneous Province. Her talk built on work on the Hart Dolerite with the Geological Survey of Western Australia, encompassing recent findings made in conjunction with companies Enegex and Dreadnought. It also included recently published findings by Zebedee Zivkovic in newly recognised Hart Dolerite emplaced amongst basement in the West Kimberley.

The conference was an excellent vehicle to gain some of the newest insights from studies on exposed subvolcanic units, numerical and physical modelling and monitoring of modern volcanoes to understand processes that are important when magma enters the upper crust.



Dr Paula Montoya (fifth from right) attended the CRIRSCO annual meeting in Perth during August.

EXPLORATION MANAGERS' CONFERENCE

24–25 September 2025, Gold Coast

Dr Ivan Belousov and Dr Paula Montoya attended the Amira Global Exploration Managers' Conference on the Gold Coast just prior to the SEG Conference in Brisbane. Ivan, together with Adam Pacey from Rio Tinto, presented a talk titled 'Using chlorite and epidote chemistry as a porphyry exploration tool: Learnings from a blind test on a real-world exploration project' on the outcomes of the Rio Tinto Blind Test that was part of Amira project P1249. Paula was promoting, and recruiting additional sponsors for, the Laramide Exploration Initiative LAXI P1376 – a new Amira Global project currently being developed.

SEG 2025

26–29 September 2025, Brisbane

A large contingent of more than 20 staff and students from CODES/ES attended this major annual world economic geology conference. See page 16 for further details about the success of this year's event for CODES.

CONNECTS 2025

19–22 October 2025, San Antonio, Texas, USA

Dr Sheree Armistead attended the Geological Society of America Annual Meeting in San Antonio, Texas, where she presented a talk titled 'A Mesoproterozoic tectonic and metallogenic link between Laurentia and Southeastern Australia: New evidence from Tasmania's Rocky Cape Group'.

Her presentation showcased new geochronology and isotopic evidence for a Mesoproterozoic connection between Tasmania's Rocky Cape Group and western Laurentia. The work attracted strong engagement from researchers interested in Proterozoic tectonics and sediment-hosted copper systems, sparking discussions on how ancient basin linkages inform mineral exploration.

The meeting also provided valuable opportunities to connect with international collaborators and highlight CODES' growing role in integrating tectonic reconstructions and metallogenesis research on a global scale.



Participants of the LASI7 conference in Iceland pictured among the new lavas near Grindavik during their field trip to the Reykjanes Peninsula in September. Dr Karin Orth is fifth from left in the front row. (Photo courtesy of the LASI7 committee.)

AWARDS AND ACCOLADES

CODES STUDENTS SHOWING THEIR METTLE AND WINNING

Several students have done extremely well in their research endeavours in recent weeks and some of them are mentioned here. See also the SEG conference success for CODES students on page 16.

MAPPING COURSE IN THE USA

CODES PhD student **Damian Braize** was successful in gaining a place on a Michael J. Fitzgerald Student Mapping Course run by the SEG through a competitive process. Damian won a spot on the Copper Flat Porphyry-Breccia System course in New Mexico, which ran from 18-25 October, with the majority of the costs covered by the SEG.

The course was led by Professor William Chávez and Dr Ralph González and offered high-quality teaching and hands-on experience. Damian gained valuable practical skills and enjoyed collaborating with fellow geology students from around the world.

Well done, Damian!

RESIDENCY SCHOLARSHIPS IN CHINA

CODES PhD student **Emrecaan Yurdakul** has received a scholarship to enable him to be a Visitor at the Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, to work with Professor Huayong Chen and collaboratively with CODES staff Lejun Zhang, Mike Baker and Rob Scott. He plans to commence his stay in China at the beginning of March 2026.

Damian Braize received the same scholarship and will be travelling to Guangzhou early in the new year. He will be collaborating with David Cooke, Sebastien Meffre and Jeff Steadman. The scholarships includes three months of stipend and travel funding, with a value of around AUD\$10,000.



CODES PhD students Damian Braize (left) and Emrecaan Yurdakul are off to China; they have each been awarded three-month scholarships to carry out research at the Guangzhou Institute of Geochemistry, Chinese Academy of Sciences under Professor Huayong Chen.



CODES PhD student Damian Braize (second from right) at the Copper Flat porphyry deposit in New Mexico during the Michael Fitzgerald Student Mapping Course run by the SEG, alongside trip leaders Marcus Angus, Ralph González, and Dr William Chávez, and former CODES visiting Masters student Chase Turner (blue cap).

AUSCOPE CURTIN IONPROBE WORKSHOP

Two CODES PhD students – **Emrecaan Yurdakul** and **Jaime Osorio** – were selected for scholarships to participate in the AuScope Curtin Ionprobe Workshop 2025. The workshop will be held at the John de Laeter Centre, Curtin University, from 24–28 November, in Perth, where students will gain experience with the SHRIMP II and CAMECA 1300-HR3 ion microprobes, which allow *in situ* isotopic and trace-element microanalysis.



CODES Honours student Tom McAuley receives his \$1,000 cheque for winning 'Best presentation' at the 2025 AusIMM New Leaders Summit from AusIMM President Chris Carr and AusIMM SA New Professionals Network Ambassador Elyse Bosch.

AUSIMM NEW LEADERS SUMMIT 2025

CODES Honours student **Tom McAuley** came away with the prize for the 'Best Presentation' at the 2025 AusIMM New Leaders' Summit, held in Perth. Congratulations Tom!! This annual event brings together young professionals and students in the mining sector to discuss key topics, network, build connections – and be inspired by leading figures in the industry.

Tom says that the summit gave him "a chance to present my recent work on gusano textures in high-sulphidation epithermal systems, which was an amazing experience; it's not every day you get the chance to talk on stage in front of 300 passionate and eager-to-learn students and new professionals. Even walked away with my first novelty cheque!"

"Massive thanks to AusIMM and all our sponsors who made it possible for the Tasmanian Student Chapter to attend. For anyone who hasn't been to one of these, it's an absolute must."

APAC MINING GAMES 2025

CODES Honours student **Anthony Tai** (standing on far left in the photo) reports on another successful outcome for our student cohort:

"In early September, a group of 11 UTAS students (made up of eight geology and three engineering students) from the AusIMM Tasmania Student Chapter travelled to Perth for this year's New Leaders' Summit and APAC Mining Games, connecting with industry leaders, learning from inspiring talks and sharing research results. At the Mining Games, the two Tassie mixed teams put in a stellar effort, with Team A taking 1st in Rock ID and 2nd overall in the Mixed Division, while Team B took home 2nd in Rock ID. It was a tough competition against well-trained and well-equipped teams, but the great results speak a lot about the effort and teamwork shown by the team and each individual!"



The AusIMM Tasmania Student Chapter were once again hugely successful at the APAC Mining Games, which were held in tandem with the AusIMM New Leaders' Summit in Perth.

OODLES OF FUN AT BOODLES

The outgoing President of the Geology Society, Honours student Angelica Matusewicz, reports on this year's Geology Dinner:

This year's annual Geology Dinner, hosted at Boodle Beasley, was a great success. Reaching maximum capacity with over 60 attendees – including UTAS postgraduates, undergraduates, staff members as well as industry experts – it made for a memorable night for new and seasoned geologists to connect and celebrate their achievements during the year.

The night's guest speaker, Dr Hannah Moore, provided a great insight into her work on volcanoes and she also judged the annual geology song contest in which the second-year geology students accomplished a clean sweep against the other contestants. An epic raffle was held with an extensive number of prizes including rare mineral samples and fossils. A subsequent awards ceremony took place where anyone attending could nominate someone of their choosing to win a custom-created award.

The night concluded with the 2025 Geology Society's handover to the 2026 committee, introducing everyone to the new tenure. We hope to see even more students and staff there next year!

If you'd like to see a whole stack more great photos from this event, go to the following link using the password UTAS2025: <https://bit.ly/GeoSocBall2025>



CODES/ES staff get into the swing of things. They are (L-R): Sebastien Meffre, Rebecca Carey, Matt Cracknell, Martin Jutzeler, Owen Missen, Rob Scott, Francisco Testa, Nicholas Direen (Honorary) and Zeb Zivkovic. (Photo: Lynne Moran Photography)



CODES PhD students in their finery: They are (L-R back row): Shouchun Yu, Damian Braize, Javier Gil Rodriguez; (front row): Wulandari Mandradewi (Exploration Geology Manager, Merdeka Copper Gold and not a student!), Poliana Vidal Salgado, Giovana Oliveira Pimentel, Angela Costa and Alfreddina Appiah. (Photo: Lynne Moran Photography)



Guest speaker, Dr Hannah Moore, who graduated with her PhD at CODES earlier this year, talked about her volcanology research, and also judged the singing competition. (Photo: Lynne Moran Photography)

FIELDWORK

INTO THE WILD: FIELDWORK IN FAR-FLUNG LOCATIONS

Once again, CODES staff and PhD students have been out in some remote and unusual places carrying out fieldwork for their research, often in collaboration with mining and exploration companies. These photos are just a taste of the huge number of great pictures taken on these sometimes-arduous trips.

SIERRA MADRE OCCIDENTAL, MEXICO

8–21 August 2025

Dr Paula Montoya took part in a field trip in the Sierra Madre Occidental in Mexico during August. The trip's main purpose was to deliver some results from the current scientific applied research study called 'Detailed petrographic characterization of multiple mineralization styles, geochronostratigraphy and tectonic events of the San Marcial Ag high-grade tectonic hydrothermal breccia at SMO, Sinaloa, Mexico'. This project is being carried out in collaboration with GR Silver Mining Ltd. Dr Montoya spent time logging and sharing knowledge with the GR Silver Mining geology team as well as with the executive management. The results from this project were presented at both the SGA Conference (Colorado) and the SEG Conference (Brisbane). Because of the high calibre of the results, GR Silver Mining has decided to extend this project into 2026, and have invited Dr Montoya to give a project presentation at PDAC next year in Canada.



In August, Dr Paula Montoya travelled to the Sierra Madre Occidental in Mexico to carry out fieldwork with GR Silver Mining Ltd. Here the company's geology team is pictured at the San Marcial project. Paula is third from right, and in the centre, explaining the map, is GR Silver Mining's VP Exploration Manager, Luis Coto.

CARGO, NSW

16–19 September 2025

CODES PhD student Jess Askew writes:

"In September I had two of my supervisors, Sebastien Meffre and David Cooke, come to Waratah Minerals' Cargo site for some field supervision of my PhD project. This was in the lead-up to the SEG field trip which followed shortly after, and for which I was a co-leader.

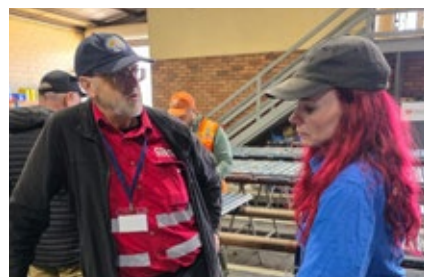
"Cargo is an upcoming exploration target in NSW that is in transition from exploration to resource step-out as the spur discovery continues to unfold. It is shaping up to be a transitional

epithermal-porphyry deposit in the Molong belt of the Macquarie Arc – about 10 km west of Cadia (a major deposit with > 50moz au)."

LULEÅ, SWEDEN

5–13 September 2025

In September, CODES PhD student Francisco Cuadra and Dr Mike Baker travelled to northern Sweden to conduct fieldwork as part of Francisco's PhD project on mineral chemistry variance mapping and geometallurgical domaining of Boliden's Nautanen IOCG deposit. The first week of the field campaign was spent at the Boliden AB Aitik copper deposit in the Gällivare-Malmberget district sampling drillcore stored there from Nautanen, while the remaining time has been spent at Boliden's head office in the town of Boliden sampling additional drillcore and conducting some micro-analytical work on his collected samples with the support of Boliden AB and assistance from Luleå University of Technology (LTU). At the conclusion of his fieldwork, Francisco will return to CODES in November to continue work on his project.



Professor David Cooke explaining the significance of albite alteration and what this implies in the Cargo deposit style to PhD student Jess Askew.



CODES PhD student Francisco Cuadra and Dr Mike Baker in front of an operating drill rig at the Nautanen IOCG deposit, Gällivare-Malmberget district, northern Sweden.

PAPUA NEW GUINEA

30 September–14 October 2025

CODES PhD student Olive Lucas Poyalou and Dr Paula Montoya took part in a field trip at the Arakompa project in PNG, as part of Olive's thesis fieldwork supported by K92 Mining Inc. Olive is researching Cu-Au veins and altered rocks in the Kainantu Cu-Au district of PNG. Dr Montoya said: "We spent two weeks logging and sharing knowledge about epithermal and porphyry systems with the K92 geology team. We also had the opportunity to visit drillhole platforms in the field, and to see some interesting outcrops!"



CODES PhD student Francisco Cuadra and Boliden AB Aitik Development Engineer Peter Karlsson discussing rock types observed in the open pit of the Aitik copper deposit, Gällivare-Malmberget district, northern Sweden.

SUMBAWA ISLAND, INDONESIA

5–13 October 2025

The Elang Cu–Au district on Sumbawa Island, Indonesia, is a world-class porphyry–epithermal province in the Eastern Sunda Banda arc. Its telescoped porphyry–high-sulfidation system provides an exceptional natural laboratory to apply and refine the exploration toolbox that we have developed through a series of industry-funded research projects at CODES.

In late October, Associate Professor Lejun Zhang visited the Elang district to supervise Aditya Pratama, an AMMAN Mineral exploration geologist and Master of Economic Geology candidate at CODES. The primary aim of the trip was to define the study scope of Aditya's Master's thesis and set up a clear forward work plan. On the site, they completed district-wide drill core reviews across all deposits and prospects, undertook targeted outcrop mapping, and selected representative samples for Aditya's upcoming analytical program at CODES. During the trip, Lejun also delivered two workshop sessions to the site team on the topics of lithocap exploration workflows and an introduction to porphyry–high-sulfidation epithermal deposits.

This project is funded and conducted in collaboration with AMMAN Mineral in Indonesia, showcasing CODES' industry-embedded training model.



Dr Paula Montoya and CODES PhD student Olive Poyalou were in the Kainantu District in the Eastern Highlands Province of PNG, where they were carrying out fieldwork related to Olive's research project.



Associate Professor Lejun Zhang (in red), CODES Masters student Aditya Pratama (far left), and the AMMAN Mineral exploration geologist team reviewing drill core from the Elang deposit at the on-site core shed.

RELAX – IT’S GEOLOGY

BEAKER STREET FESTIVAL

12–24 August, various venues,
Hobart

CODES PhD student Pratichee Mondal has been an enthusiast of outreach from the word go during her time at UTAS. Here she gives a flavour of what it’s like to talk geology to those who come in out of Hobart’s winter-dark streets in August to meet the scientists taking part in the Roving Scientist Program at the Beaker Street Festival.

This year was my first time as a Roving Scientist at the Beaker Street Festival, and it exceeded every expectation! Stepping into a buzzing Hope and Anchor Tavern venue filled with curious minds of all ages, I had the joy of sharing my passion for geology in the most relaxed and engaging setting imaginable.

My mission? Simply to chat science – specifically rocks! I brought along a small but exciting collection of rocks that I have gathered from different corners of the world. It was incredible to see how enthusiastically people responded to them. From fizzing of carbonates with a splash of acid to peering through lenses at sparkling garnets, the hands-on curiosity was contagious. Children, students, parents and retirees alike were so eager to touch, test and ask questions – turning each conversation into a mini adventure through Earth’s history.

One of my absolute favourites was the glowing LED badge that we had to describe our research areas and mine said ‘Rocking Geologist’. Being part of this festival reminded me why I love science outreach: it brings people together, fuels curiosity and shows that learning can be both accessible



CODES PhD student Pratichee Mondal talks geology to enthusiastic attendees at the Beaker Street Festival in August – she’s wearing her glowing LED badge.

and seriously fun. I’m already looking forward to returning next year – with more rocks, more stories, and my glowing LED badge.

BIG TURNOUT FOR SCIENCE SPECTACULAR

FESTIVAL OF BRIGHT IDEAS (FOBI)

22–23 August, Princes Wharf 1,
Hobart

The University of Tasmania plays a big part in FOBI, Tasmania’s premier National Science Week event, where anyone can join scientists from various agencies and organisations to learn more about the wonderful world of science. There are many hands-on activities to enable people to dig deeper into the topics.

This year Professor Sebastien Meffre was joined by Honours student William Sinclair to host the



Head of Earth Sciences Professor Sebastien Meffre pictured interacting with attendees at the Festival of Bright Ideas held on the Hobart waterfront in August.

Earth Sciences stand, and share their enthusiasm for geology. Sebastien and Will engaged both school groups and the general public with three activities. The younger kids sorted and identified polished gemstones. The older kids tried to match replica blocks from the Minecraft computer game with rock and mineral specimens

from the collection. The oldest kids and adults looked at Tasmanian rocks under the microscope, in crossed polarised light, learning how geologists recognise minerals in thin section. At least a thousand people interacted with the activities over the two days.

SE ASIA SPECIALIST WHOSE LEGACY WILL LIVE ON



DR CLIVE FRANCIS BURRETT

22 September 1948–
4 September 2025

Dr Clive Burrett as pictured in the corridor gallery of Geology/CODES PhD graduates here at UTAS. Clive completed his PhD in 1978.

Dr Ron Berry, who worked alongside Clive Burrett for many years at UTAS, recounts how Clive’s dedication and enthusiasm for his subject led him to be a leading figure in the geology of SE Asia, where he was living when he passed away.

Dr Clive Burrett passed away on 4 September 2025 at the age of 77 in Khon Kaen Hospital, northeastern Thailand. Clive was born in London. He studied geology for a BSc (Hons) at Queen Mary College, London University, and graduated in 1970. It was the middle of the Poseidon Ni boom, and the University of Tasmania was overflowing with geology students. Clive came to Hobart straight from his graduation as a Demonstrator (Lecturer level A) and started his PhD (part-time) on the ‘Middle-Upper Ordovician conodonts and stratigraphy of the Gordon Limestone Sub-group, Tasmania’. He was heard to bemoan on occasion how few conodonts there are in the Gordon Limestone and how many drums of acetic acid it took to find them. He finished his PhD in 1978.

Dr Burrett worked his way through the promotions system at UTAS getting to Reader by 2000. He was Head of the School of Earth Sciences for three years (1997–2000). On retirement in 2006, he moved to northern Thailand where he set up house over a fish farm and continued working on geology projects around SE Asia both as a consultant and with various Thai institutions starting with the geology department at Chiang Mai University. From 2009 he was an honorary researcher at the Palaeontological Research and Education Centre at Mahasarakham University in northeast Thailand working on the tectonics, regional geology and palaeontology of mainland SE Asia, and was still publishing papers in 2025.

Clive trained as a conodont specialist, but his geological passion was tectonic reconstructions. He produced the first terrane analysis of Eurasia. There were forays into other areas including the Palaeozoic of Tasmania. He branched out into the petroleum potential in the Permian and older sediments. He had a quick look at Tasmanian correlates in Antarctica. In 2000 he worked on Proterozoic reconstructions and Tasmania’s place in Laurentia. Then there was the search for that meteorite impact crater in NE Thailand (2004). In all these studies Clive interacted with



Dr Clive Burrett (right) with Professor Khin Zaw and Dr Prinya Putthapiban at the 1st Mahidol University International Geoscience Conference, which was held in western Thailand in January 2024; all three men were keynote speakers at the conference.

a wide range of coworkers. He was active in the GSA and the Association of Australasian Palaeontologists. Clive was appointed a Distinguished Fellow of the GSA in 2010.

Clive’s passion for geoscience extended far beyond his early interests in paleo reconstruction and paleogeography. Over time, he broadened his research scope to encompass geodynamic settings and metallogeny as well as U-Pb zircon geochronology, where he made lasting contributions to our understanding of SE Asia’s complex geological framework. He demonstrated a unique ability to link Gondwana rift-history with the processes that control mineral deposit formation, providing both valuable insights and practical applications – for example, one of his inspiring talks was ‘How fossils apply to mineral exploration’.

From 2003 to 2014, major projects examining the tectonic and metallogenic evolution of SE Asia were conducted at CODES sponsored by several international and Australian companies. Those years were marked by intensive field campaigns, cross-disciplinary discussions, and integration of regional to global data sets – an approach that Clive always championed. He was never content with narrow or isolated studies; instead, placing geological features within the broader geodynamic context. Clive played a pivotal role in these projects. He was a stimulating collaborator. He contributed not only his profound scientific expertise but also his unique ability to synthesise complex data sets into coherent paleo-tectonic models. The outcome of this collaboration was a series of widely cited, high-impact publications that advanced both academic understanding and practical exploration strategies across the region. Clive left an enduring legacy in SE Asian geology – one that will guide researchers and inspire students for many years to come.

RECENT CODES PUBLICATIONS

Here we include recent research published over the past six months. You can find a full listing of past years' CODES published papers in our annual reports: www.utas.edu.au/codes/publications/annual-reports

Alfredtina Appiah, lead author; Mohammad Fathi, Julie Hunt & Owen Missen, contributing authors, published online November 2025:

Appiah, A.A.A., Fathi, M., Hunt, J., Missen, O.P., Abaka-Wood, G., Delcheva, I., Wilson, M. & Feig, S. 2025. Recovery of magnesite from silicate gangue minerals via reverse flotation using a novel alkyl ether amine collector. *Powder Technology*: vol. 469, Part 2, 15 February 2026, 121886.

Ivan Belousov, contributing author, published June 2025:

Asimus, J.L., Halpin, J.A., Daczko, N.R., Whittaker, J.M., Coffin, M.F., Belousov, I., Mulder, J.A. & Glorie, S., 2025. Discovery of the William's Ridge and Rig Seismic Seamount Microcontinents, Kerguelen Plateau: Signatures of a Fragmented Rifted Margin. *Tectonics*: 44(6).

<https://doi.org/10.1029/2025TC008958>

Ivan Belousov, Khin Zaw & Charles Makoundi, contributing authors, published August 2025:

Kyaw Thu Htun, Khin Zaw, Belousov, I., Yonezu, K., Makoundi, C., Watanabe, K. & Goemann, K., 2025. U-Pb zircon and cassiterite geochronology of Sn-W bearing granitoids at the Tagu mining area in the Myeik region, Southern Myanmar: Insight into ore genesis and metallogenic implication. *Geosystems and Geoenvironment*: 4(3).

<https://www.sciencedirect.com/science/article/pii/S2772883825000664?via%3Dihub>

Ivan Belousov, contributing author, published online November 2025:

Negi, P., Saikia, A., Belousov, I., Danyushevsky, L.V., Ahmad, M. & Akhtar, S., 2025. Petrogenesis and U-Pb zircon age of the Anorthosite-Gabbro-norite association near Barabar Hill, Chotanagpur Granite Gneiss Complex (CGGC), eastern Indian shield. *Precambrian Research*: 431.

Ivan Belousov, contributing author, published online November 2025:

Saikia, A., Negi, P., Kiso, E., Belousov, I. & Danyushevsky, L.V., 2025. Crustal growth of Assam Meghalaya Gneissic complex related to Kuunga Orogeny: Insights from A2-type granitoids of the West Mikir Hills (Assam), Northeast India. *Lithos*: vols 518–519, 2025, 108312.

Yamila Cajal, lead author; Carlos Carrasco-Godoy, contributing author, published June 2025:

Cajal, Y., Campbell, I.H., Carrasco-Godoy, C. & Martínez, C., 2025. Magmatic evolution of the Supergiant Rio Blanco-Los Bronces Porphyry Cu Deposit, Central Chile. Implications for ore-forming processes. *Journal of Petrology*: 66(6).

<https://academic.oup.com/petrology/article/66/6/egaf056/8169908>

Shannon Frey, lead author; Martin Jutzeler & Rebecca Carey, contributing authors, published August 2025:

Frey, S.E., Jutzeler, M. & Carey, R.J. et al., 2025. In-situ sedimentary evidence of complex bottom currents at a modern deepwater seamount. *Nature: Communications Earth & Environment*: vol. 6, 709.

<https://doi.org/10.1038/s43247-025-02690-7>

Annah Moyo, lead author; Sebastian Meffre & David Cooke, contributing authors, published online September 2025:

Moyo, A., Parbhakar-Fox, A., Meffre, S. & Cooke, D.R., 2025, Co-disposal of wood ashes and mine wastes to control acid and metalliferous drainage. *Environmental Research*: Vol. 286, Part 2, 1 December 2025, 122853.



District scale geology of the Cowal Igneous Complex and surrounding area, part of Figure 1, taken from Markus Staubmann et al., 'The GRE46 Epithermal Gold Deposit, Cowal, New South Wales: Geology, mineralization, alteration, and ore genesis' published in *Economic Geology* in June 2025.

Emmanuel Dogara Musa, lead author; Julie Hunt, Mohammad Fathi & Owen Missen contributing authors published online November 2025:

Musa, E.D., Hunt, J., Fathi, M., Missen, O.P., Doherty, G. & Mollison, M., 2025. Coarse froth flotation to optimise scheelite recovery. *Minerals*: 15(11), 1183.

Markus Staubmann, lead author; David Cooke, contributing author, published June 2025:

Staubmann, M., Cooke, D.R., Halley, S., Milojkovic, T., Reid, B., Green, M., Howard, H. & Clifford, M., 2025. The GRE46 Epithermal Gold Deposit, Cowal, New South Wales: Geology, mineralization, alteration, and ore genesis. *Economic Geology*: 120(4): 847–876.

<https://doi.org/10.5382/econgeo.5160>

Lejun Zhang & David Cooke, contributing authors, published November 2025:

Wang, S., Zhou, T., Anenburg, M., Hollings, P., Zhang, L., Fan, Y., Cooke, D.R. & Fu, B., 2025, Metal scavenging by sulfide oxidation in porphyry copper deposit root zones: *Nature: Communications, Earth & Environment*: vol. 6, Article number: 876 (2025).

CHANGING FACES

The past few months have been one of relative calm as far as new faces at CODES are concerned. However, the whole CODES family was shocked and saddened to learn in late October of the passing of our Lapidary Manager, Al Cuison (see the obituary on page 14).

PhD STUDENT	START DATE	PROGRAM	PROJECT TITLE
 Mauricio Enrique Valarezo Cuenca	4 August 2025	Program 4, supervised by Rebecca Carey, Lejun Zhang, Franciso Testa, David Cooke	Exploring the shallow and deep explosion mechanisms in volcanoes that drive eruptions, or the sub-surface mineralisation of copper and critical metals

ARRIVALS



Dr Kelsey Picard recently completed her PhD in plant genetics at the University of Tasmania, and has joined the Discipline of Earth Sciences as a Senior Technical Officer after a short period working in industry in an analytical chemistry laboratory. She began her role at UTAS in early August.

DEPARTURES



Al Cuison, our Lapidary Manager, sadly passed away on 24 October after fighting an aggressive medical condition. He is remembered with great fondness and appreciation by all the staff and students who worked alongside him. See page 7 for an obituary of Al.



Olivia Parker will be leaving her role as Executive Officer for CODES in November and moving to a permanent role as Executive Officer to the Heads of GPSS, ICT, Engineering, and Architecture and Design. We thank Parker for her positive impact at CODES.

POSTGRADUATES MOVING ON UP



Takeshy Coaquira has submitted his thesis for examination: it is titled 'Mineral chemistry tools for targeting copper porphyry deposits: A case study of the supergiant high-grade Resolution Cu-Mo deposit, Arizona'.



Shannon Frey has submitted her thesis, titled 'Syn- and post-eruptive sedimentation in an active intra-oceanic arc, Kermadec arc/Rangitāhua, New Zealand', for examination. She sent it to examiners while on board the RS *Investigator* when she was taking part in the recent research voyage to Tonga.



Arka Sahu also recently submitted his thesis for examination. It is titled 'Quantitative prediction of mineralogy, mineral chemistry, and proximity to ore body in porphyry deposits from near-infrared spectral data'.



Lieth de Selincourt has also submitted his thesis for examination; it is titled 'Application of mineral chemistry to aid exploration for Cu-Au-Mo porphyry mineralisation in the Temora district, New South Wales, Australia'.

UTAS GEOLOGY GRADUATE HONoured IN NEWCASTLE

Professor Beryl Nashar AO OBE was the first person to graduate from the University of Tasmania with a PhD in geology, and she continued to be a trailblazer for women in science. She later became the first female Dean of Science at any Australian university. Recently she was honoured by having a building named after her at Newcastle University, where she worked for some years: the Beryl Nashar Building at the Callaghan Campus. This photo of Professor Nashar is taken from the gallery of PhD graduate photographs lining the corridors in the CODES/Earth Sciences department at UTAS.





**A MESSAGE
FROM THE
CODES
DIRECTOR,
PROFESSOR
DAVID COOKE**

The past five months have been one of the most active periods for the CODES team in recent years. As outlined elsewhere in this newsletter, we've delivered four Masters units (Ore Deposit Geochemistry, Data Analytics, Ores in Magmatic Arcs, and Geometallurgy), led two field trips for the SEG international conference, socialised major new research proposals, secured funding to initiate our new sediment-hosted Cu project, presented numerous talks and posters at several international conferences, completed one of our larger industry-funded research projects, shortlisted

applicants for several new PhD projects, and published several papers in high-impact journals. Two of our staff (Ivan Belousov and Martin Jutzeler) submitted ARC Fellowship applications, Takeshy Coaquira, Shannon Frey, Arka Sahu and Lieth de Selincourt submitted their theses. Several other PhD candidates will submit their theses soon. Our 2025 Honours cohort are also coming to the end of their studies at UTAS in the next few weeks. There has been significant cause to celebrate success by our team members over the past few months.

Al Cuison's untimely passing in late October is a tragedy that has impacted all at CODES deeply – our thoughts are with Liezl, April and Aaron at this very sad time. Al worked for the past 19 years at UTAS and was looking forward to his impending retirement in the next couple of years. His work underpinned

much of our teaching and research activities for the past two decades, providing the polished laser mounts, thin sections and polished rocks essential to our daily activities. Al has left a legacy of beautifully prepared samples that we use for teaching, and so his legacy will live on (see page 14 for his obituary).

I'd like to personally thank Olivia Parker, who is leaving us to take up a substantive permanent role elsewhere in UTAS. Although Parker only worked with us for a few months, she endeared herself to all of our team members with her bright, sparkling personality, willingness to help and get things done, and her professional approach to everything that she does in the workplace. Thanks Parker, and good luck in the new role!

David Cooke

UPCOMING SHORT COURSES

ADVANCED FIELD SKILLS IN ECONOMIC GEOLOGY (KEA718)

1–14 FEBRUARY 2026

A field-based unit run in Tasmania that will teach fundamental and advanced mapping and field skills suitable for use in the minerals industry, including field-based rock and mineral identification, fact and form surface mapping, Anaconda-style mapping, structural measurement and graphic logging techniques for drill core, and the use of spectral, geochemical and remote sensing data sets in making and interpreting geological maps.

Unit leaders: Dr Rob Scott, Associate Professor Lejun Zhang, Dr Mike Baker

Delivery mode/location:
Face-to-face, Tasmania (Australia)

VOLCANOLOGY AND MINERALISATION IN VOLCANIC TERRAINS (KEA708)

4–18 MARCH 2026

This unit provides an introduction to the processes and products of different

eruption styles, contrasts in scale and structure of volcanoes, identification of key volcanic facies associations and interpretation of facies variations. Mineralisation and alteration processes related to hydrothermal systems in subaerial and submarine volcanic environments and implications for mineral exploration are included. This is a field-based unit with a trip to the North Island of New Zealand to examine modern volcanic systems, and a trip to the West Coast of Tasmania to examine the well-mineralised and altered Cambrian Mt Read Volcanics.

Unit leaders: Dr Martin Jutzeler, Associate Professor Lejun Zhang, Dr Rob Scott

Delivery mode/location:
Face-to-face, New Zealand (North Island) and Australia (Tasmania)

ORE DEPOSIT MODELS AND EXPLORATION STRATEGIES (KEA712)

JULY–AUGUST 2026

This unit is an up-to-date synopsis of key ore deposit types including porphyry,

epithermal and skarn deposits, IOCG deposits, magmatic sulfide deposits, orogenic and Carlin-type gold deposits, volcanic-hosted massive sulfide and sea-floor hydrothermal deposits, sediment-hosted-Cu, Zn-Pb and Broken Hill-type deposits. Most deposit types receive the equivalent of a full day of lectures and practical exercises, addressing the location, characteristics, genesis and exploration strategies.

Unit leaders: Professor David Cooke, Dr Rob Scott

Delivery mode/location:
Blended delivery (face-to-face and online)

For more details about these courses see the course flyers at:
www.utas.edu.au/codes/masters-short-courses

For further information about short courses in general, please email:
CODES.Info@utas.edu.au
OR Master of Economic Geology Program Co-ordinator, Dr Robert Scott:
Robert.Scott@utas.edu.au