



MASTER OF ECONOMIC GEOLOGY UNIT

via online delivery

Exploration in Brownfield Terrains

Week 1: 24–29 October, 2022

Week 2: 28 November–2 December, 2022

Online content will be delivered via Zoom between 9am and 6pm AEDT (UTC+11)



CODES, Centre for Ore Deposit and Earth Sciences, University of Tasmania

CRICOS Provider Code 00586B

Exploration in data-rich environments, close to existing mines, has become a preferred and successful method of increasing company resources in recent years. With this exploration philosophy in mind, CODES is proud to present a Masters-level two-week intensive training program designed to bring participants up to date with the latest exploration techniques.

The course will cover cutting-edge technologies in geophysics, geochemistry, hyperspectral reflectance and 3D visualisation, using real data from world-class mineralised districts. The program is presented by expert teaching staff from CODES and leading minerals industry professionals.

CONFIRMED PRESENTERS AND PANELLISTS

John Ashton worked in several roles for Boliden at the Navan Zn-Pb mine in Ireland including Chief Mine Geologist and as Chief Exploration Geologist up to retirement in 2019. Earlier work includes PhD research on Zn-Pb-Au vein geology and litho-geochemistry in Central Wales, and as mine geologist at the Silvermines Zn-Pb orebody in Ireland. Experience and interests include 3D geological modelling, resource estimation, the genesis of carbonate-hosted Zn/Pb deposits and exploration for base metal deposits. Since retirement he has been providing consultancy services to Boliden's exploration JVs in Ireland.

Tim Baker has been Chief Geoscientist for Eldorado Gold Corporation since 2012. Tim is a graduate of the University of Cardiff, Wales, and holds a Doctorate in geology from James Cook University in Australia. He has over 25 years of experience working in industry, academia and government including research and academic positions at the Mineral Deposit Research Unit, University of British Columbia, and James Cook University, as well as Director of the Geological Survey of South Australia and Exploration Manager of Sovereign Metals. In 2002 Tim received the Society of Economic Geologists' Lindgren Award.

Paul Dale works for Catalytic Metals.

Oliver Davies is currently CEO at Sky Metals having been at SKY since listing in 2019. Previously Oliver worked in exploration and operational roles with Evolution Mining and Alkane Resources in NSW and Qld. Oliver has worked closely on several successful exploration projects including the significant expansion of Evolution Mining's Lake Cowal gold resource and with Alkane's regional exploration success at Tomingley and Boda.

Wessley Edgar (MSc Mineral Econ., BSc Geology Hons) has been Chief Geologist (Aust.) for Agrico Eagle and its Australian predecessors Kirkland Lake Gold and Newmarket Gold since 2016. He has 32 years' experience in various mine and exploration roles for RGC, Goldfields Ltd, Auriongold, Placer Dome Asia-Pacific, Iberian Resources, Castlemaine Goldfields, and Navarre Minerals. Maintaining input into exploration in the Northern Territory since the Cosmo-Lantern mine closed in 2020, his first mine experience was at the Pine Creek gold mine there in 1991.

Kim Frankcombe graduated from UTAS, prior to the creation of CODES, with a geology and geophysics double major. He started working life as an exploration geologist before transitioning to an exploration geophysicist. He has worked for international and national majors, global contractors and for the past 25 years as a consultant within consulting groups. He provides everything from broad geoscience advice to single prospectors and juniors with low levels of technical expertise through to high level specialist geophysical advice to large company geophysicists and other consulting groups.

Scott Halley is an independent consultant specializing in exploration geochemistry, and the application of multi-element ICP geochemistry and SWIR analysis to mapping alteration mineral zonation patterns around hydrothermal systems. Over the past 20 years, Scott has consulted to more than 180 mining and exploration companies in more than 25 countries.

Kate Hine is the Principal Consultant for, and a Director of, Mitre Geophysics which has been advising the mining industry since 1980, and has worked on projects across the globe including both Antarctica and the Arctic. Kate has 20 years experience working on a wide variety of commodities in a range of different geological settings, with some of the most interesting and exciting discoveries in Australia and worldwide. In Kate's portfolio of discoveries, several are more than 400m below surface with no surface indications. Her particular specialty is high quality EM processing and interpretation, but she also has unrivalled expertise in MMR methods, used to detect and define weakly conductive mineralisation. Kate is also active in research and publication and has won two 'Best Paper' awards from the Australian Society of Exploration Geophysicists. She is also regularly invited to speak at industry events. Kate graduated in 2002 from the University of Tasmania.

Terry Hoshke joined Geopeko in the 1980s exploring for a number of commodities including gold, uranium and base metals. This included conducting IP and magnetic surveys at North Parkes. He managed the Darwin exploration office for North Limited for 3 years from 1992 and subsequently worked on porphyry exploration for North in Indonesia. He worked for Normandy/Newmont from 2001 to 2013 during which time he completed an MSc thesis on the geophysics of porphyry and epithermal systems. This was subsequently published by CODES. He is currently a geophysical consultant, based in Perth. He has worked on a number of projects in NSW including geophysics in the Cadia area for Newcrest.

Ned Howard is Principal Geologist, Technical at Evolution Mining. After graduating from UTAS with BSc Hons in 2004, Ned worked as an exploration geologist with Barrick and junior companies in Australia, Indonesia, PNG and Canada, before joining Evolution Mining in 2013. With Evolution, he has held geoscience and project generation roles supporting their near-mine and greenfields exploration efforts. He specializes in geochemical and spectral applications and has worked on a number of gold deposit styles, predominately Archean greenstone and epithermal.

David Isles is a semi-retired geophysicist. He provides consulting and training services through Southern Geoscience Consultants focused on interpretation of aeromagnetics, gravity and radiometrics in mineral exploration applications.

Corey Jago is a Geologist with 17 years industry experience in the near-mine exploration and resource development of base and precious metal resources throughout Australia and the DRC. He is a graduate of CODES having completed a Bachelor of Science Honours in 2005 and a Master in Economic Geology in 2021. His current role is focused on building orebody knowledge at Rosebery and incorporating it into the various aspects of the mining value chain such as geology, mining, processing, environment and growth.

Andrew McNeill is Chief Government Geologist, Mineral Resources Tasmania. Andrew completed his PhD at CODES in 1998, has spent many years as an exploration geologist in both Tasmania and mainland Australia, six years at CODES working on VHMS and magmatic Ni, and has for the last 9 years worked at Mineral Resources Tasmania.

David Rhys is a Consulting Structural Geologist, Panterra Geoservices. He has extensive experience in gold deposits, having worked globally on numerous gold districts of various types for a variety of clients including both major and junior companies.

Francois Robert holds degrees in Geological Engineering, MSc, and PhD degrees from Ecole Polytechnique in Montreal. His PhD focused on the now classic orogenic Sigma gold-quartz vein system at Val d'Or, Quebec. After a post-doctorate at the University of Michigan, he spent 12 years at the Geological Survey of Canada studying gold deposits in deformed terranes in Canada and abroad. He then spent 22 years with Barrick Gold Corporation, the last 12 of these as Chief Geologist - Global Exploration. He retired at the end of 2019 and now works as a part-time consultant to the Minerals Industry. He has published numerous papers on gold deposits in greenstone belts and contributed extensively to scientific organizations such as SEG. He also received multiple national and international awards.

Shaun Schneider is the Director for Near Mine Exploration at Newmont Australia and has been with the company since 1997. Shaun has worked in the mining and exploration industry for the last 26 years with experience inclusive of regional exploration, near-mine exploration, resource development, resource evaluation and mine production geology. He has worked on various exploration projects and gold mining operations in Australia, New Zealand, Nevada USA, Canada, Peru, Ghana and Indonesia. In the last ten years Shaun was the country Exploration Manager with PTNNT in Indonesia leading the execution of a multiple rig, heli-supported drill program to advance the Elang Au-Cu Porphyry deposit to Resource declaration (20Moz Au, 13Bib Cu). More recently Shaun held the position of Geology and Tech Services Manager at the Tanami Operation in the Northern Territory where he led a team to deliver 6.8 Moz of new Reserve from 2013 to 2020.

Jo Whelan is Manager, Basement Geoscience, Northern Territory Geological Survey

Andy Wurst joined Barrick Gold in 2014 as Global Chief Geoscientist Project Generation, based in Montreal, Canada, prior to this he held senior positions at Gold Fields and Ivanhoe Mines in Chief Geologist and project generation roles. He gained his BSc (Hons) majoring in marine biology and geology from the University of Adelaide, and a PhD in economic geology from CODES at the University of Tasmania. He has 30 years of worldwide experience in the mineral industry searching for a range of metal types in over 40 countries on 5 continents in diverse environmental and geographical regions. Andy has been fortunate enough to have been a part of teams associated with several internationally significant mineral deposit discoveries and developments.

Tony Webster is Principal Structural Geologist, GeoDiscovery Group. He specialises in the application of structural geology to problems in mining and exploration geology, and in unravelling the litho-structural architecture of complexly deformed ore deposits.

Lesley Wyborn is Honorary Professor, Australian National University. Her geoscience research focuses on improving the understanding of major Proterozoic Granite Systems and in developing the concepts for national to regional controls on major Mineral Systems.

Participants will require a computer capable of running Leapfrog Geo and iGas in order to facilitate 3D visualisation and analysis of exploration data. Training licences for these software packages will be available if required by participants.

CODES PRESENTERS

Michael Roach, Senior Lecturer

Robert Scott, Senior Lecturer and Masters Co-Ordinator

Exploration in Brownfield Terrains

is offered as a unit in the national Minerals Geoscience Masters program.

MASTER OF ECONOMIC GEOLOGY

THE MOST COMPREHENSIVE MASTER DEGREE IN MINERAL EXPLORATION AND MINING GEOLOGY ANYWHERE IN THE WORLD

This Masters by coursework program is aimed at geoscientists who want to gain a thorough up-date on advances across the spectrum of economic geology applied to mineral exploration. The Master of Economic Geology at UTAS is part of the national Minerals Geoscience Masters (MGM) program, jointly offered by the University of Tasmania and the University of Western Australia, in conjunction with Curtin Business School at Curtin University.

Course structure

The Masters degree can be completed in either of two ways:

Option 1: requires the completion of six coursework units and a minor research thesis. Four of the units must be completed at CODES, while the remainder may be completed at other participating universities. Duration: 18–24 months full-time; up to 30 months part-time (flexible in recognition of industry participants).

Option 2: requires the completion of eight units of coursework, at least five of which must be undertaken at CODES. Duration:

up to 30 months part-time (flexible in recognition of industry participants).

Participating universities offer up to six units annually or in rotation over a two-year period. Most units are of two weeks duration.

Fees

UTAS tuition fees are approximately \$2,005 per unit (8 in total) for domestic students (2022 rate for Commonwealth Supported Places) and \$8,636 (AUD) per unit for full-fee paying overseas students (FFPOS) (2022 rate). Field-based courses have additional costs. Costs will vary for units taught by other MGM partner institutions.

Entry Requirements

A BSc (Hons), or a BSc (majoring in geoscience) with at least two years industry experience. International students should also refer to <http://www.international.utas.edu.au>. English language proficiency requirements also apply.

Masters units offered by CODES

- 24 – 29 October & 28 November – 2 December 2022:
KEA710 Exploration in Brownfield Terrains
- 11 – 24 November 2022:
KEA708 Volcanology and Mineralisation in Volcanic Terrains (New Zealand, western Tasmania) ^
- 12 – 25 February 2023:
KEA718 Advanced Field Skills in Economic Geology ^
- 12 – 24 March 2023:
KEA707 Ores in Magmatic Arcs (Indonesia) ^
- 17 – 22 April & 8 – 12 May 2023:
KEA716 Fundamentals of Economic Geology
- 29 May – 3 June & 3 – 7 July 2023:
KEA709 Ore Deposit Geochemistry, Hydrology and Geochronology
- August – October 2023 (Intensive Part 2: September):
KEA713 Geodata Analytics
- September – October 2023:
KEA707 Ores in Magmatic Arcs (South America) ^
- October 2023:
KEA711 Geometallurgy

- February 2024:
KEA718 Advanced Field Skills in Economic Geology ^
- April – May 2024:
KEA716 Fundamentals of Economic Geology
- June – July 2024:
KEA712 Ore Deposit Models and Exploration Strategies

^ COVID-19 travel restrictions may impact the running of this unit

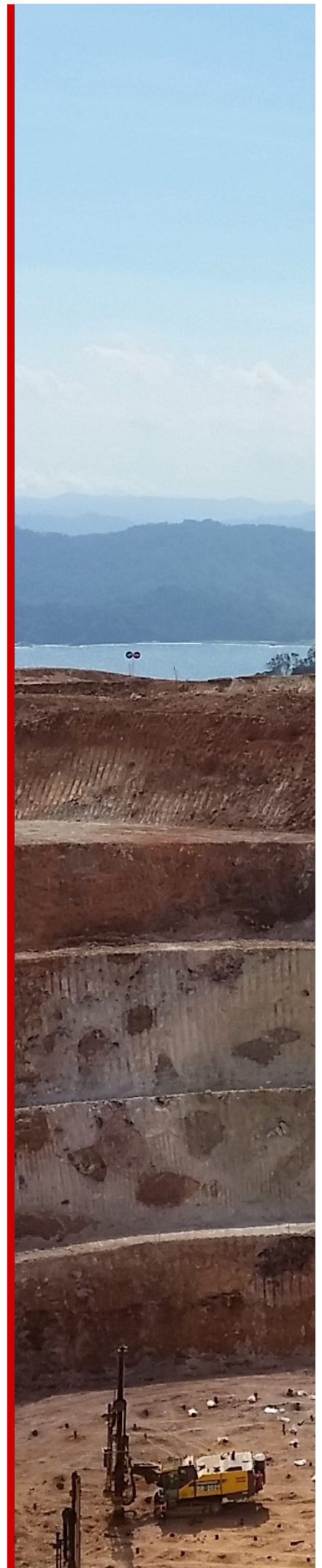
For further information contact:

Dr Robert Scott
Masters Coordinator, CODES
Private Bag 79, Hobart 7001, Australia
Tel: +61 3 6226 2786
Email: CODES.Info@utas.edu.au
Robert.Scott@utas.edu.au
Website: <http://www.utas.edu.au/codes/masters-short-courses>

PROGRAM

Monday 24 October	(am) Introduction to Brownfields Exploration: Perspectives and Case Histories (Robert Scott, Ned Howard, John Ashton, Andrew Wurst)
	Panel 1: Brownfield Philosophies: Past, Present and Future (Ned Howard, John Ashton, Andrew Wurst)
	(pm) Database Management
	Panel 2: Working with Old Data: Challenges and Opportunities (Tony Webster, Andrew McNeill, Oliver Davies)
	Database practical
Tuesday 25 October	Brownfields Exploration: Geophysics (Michael Roach)
Wednesday 26 October	Panel 3: Geophysical Brownfields Exploration (Terry Hoschke, Kate Hine, Kim Frankcombe)
	Brownfields Exploration: Geophysics cont. (Michael Roach)
Thursday 27 October	Brownfields Exploration: Geochemistry (Scott Halley)
	Panel 4: Exploration in Mature Terrane: The Mount Read Volcanics (Andrew McNeill, Corey Jago, Paul Dale)
	Hellyer practical exercise (Scott Halley)
Friday 28 October	(am) Hellyer practical exercise cont. (Scott Halley)
	(pm) 3D Modelling—Leapfrog introduction (Robert Scott)
Saturday 29 October	3D Modelling—Leapfrog cont. (Robert Scott)
Monday 28 November	Panel 5: An Introduction to the Pine Creek Inlier, Northern Territory (David Isles, Lesley Wyborn, Wess Edgar, Jo Whelan)
	Brownfields exploration in Proterozoic Au Districts (Robert Scott, Michael Roach)
Tuesday 29 November	Panel 6: The influence of Choosing Gold Deposit Models to Brownfields Exploration Strategies (Francois Robert, David Rhys, Tim Baker, Shaun Schmeider)
	Brownfields Exploration in Proterozoic Au Districts (Robert Scott, Michael Roach)
Wednesday 30 November	Brownfields exploration in Proterozoic Au Districts cont. (Robert Scott, Michael Roach)
Thursday 1 December	Brownfields exploration in Proterozoic Au Districts cont. (Robert Scott, Michael Roach)
Friday 2 December	Student Presentations and Wrap-Up

** An option to register for just the Panel sessions is available.



REGISTRATION FORM

Exploration in Brownfield Terrains

Week 1: 24–29 October, 2022

Week 2: 28 November–2 December, 2022

Please complete and return to:

CODES

University of Tasmania, Private Bag 79
Hobart, Tasmania, Australia 7001

Ph: +61 3 6226 2472

Email: CODES.Info@utas.edu.au

PERSONAL DETAILS

Title—Please highlight (Prof / Dr / Mr / Mrs / Ms / Miss)

First Name: Last Name: (surname / family name):

Preferred Name:

Position:

Company / University / Affiliation:

Address:

City: State: Postcode: Country:

Email: Phone (mobile / cell):

Dial-in Location (ie City): Dial-in Timezone (e.g. UTC+10):

REGISTRATION FEES

All fees are in Australian dollars (AUD) and include GST.

Please indicate ☒

Minerals Geoscience Masters Program (MGM) Students:

(Excludes UTAS tuition fee)

- ☐ Full course (free)- University of Tasmania enrolled
☐ Full course (free)- University of Western Australia enrolled

Industry Participants:

- ☐ Full course (\$3,300), 6 or more days
☐ ___ days at \$550/day (maximum charge 6 days, indicate days below)

Other Full-time Students (must provide proof of student status):

- ☐ A limited number of discount places may be available for full-time students from other institutions. Please contact CODES.Info@utas.edu.au to inquire about availability, together with proof of current full-time enrolment.

Panel Sessions only:

- ☐ All Panels (\$1,000)
☐ ___ Panels (\$200/panel) (circle selected panels: 1 2 3 4 5 6)

PLEASE NOTE:

Participants *NOT* attending entire course, please circle selected days

Week 1: 24 25 26 27 28 29 October

Week 2: 28 29 30 1 2 November—December

PAYMENT

Registrations are due by the 13th October, 2022. Full payment must be received by the 20th of October, 2022.

Preferred payment method. Please indicate ☒

☐ Credit Card via Payment Portal

Upon receipt of your registration form and confirmation of your place, you will be provided with a payment reference number and web address for online payments (the payment portal will provide you with a tax invoice/receipt upon payment). Please note: Credit card details cannot be accepted by email.

☐ Invoice (payment can be made by credit card or bank transfer)

Invoice to (name/company):.....

Attention to (optional):.....

Reference (e.g. order number (optional)):.....

Address:.....

.....

.....

Email address:.....

Please retain a copy of this form for your records and email or post original to CODES.Info@utas.edu.au

MGM STUDENTS: THIS FORM DOES NOT CONSTITUTE AN OFFICIAL UNIVERSITY ENROLMENT – YOU MUST ALSO ENROL VIA ESTUDENT BY THE INTERNAL DEADLINE (this may be different to the date above)