CODES presents a short course on

Ore Deposit Geochemistry, Hydrology and Geochronology

June 12 – 23, 2017

An up-to-date review of the theory and practice of geochemistry, hydrology and geochronology as applied to studies of ore deposit genesis and in mineral exploration. The first week covers basic principles of ore fluid chemistry, fluid-rock interaction, lithogeochemistry, hydrology and geochronology. Other topics include granite geochemistry and metallogeny, controls on magma composition and fertility in magmatic arcs, and mineral chemistry vectoring in porphyry and epithermal environments. The second week covers next-generation geochemical exploration techniques, including the use of pyrite in mineral exploration (using samples provided by short course participants), whole-rock geochemical data, stable isotope geochemistry, and the physical hydrology and isotopic evolution of fracture-controlled hydrothermal systems.

WHO SHOULD ATTEND: Ore deposit researchers, industry professionals and exploration geologists requiring an up-to-date overview of ore forming systems and how this knowledge can enhance mineral exploration.

This short course is offered as part of the national Minerals Geoscience Masters (MGM) program. Industry participants and other students are also encouraged to attend.
We want your pyrite!

Participants must provide a small pyritic rock sample for study during the short course. The trace element composition of pyrite in the sample will be mapped by LA-ICPMS prior to the course. Participants use the data to make predictions about deposit type, proximity and fluid chemistry based on the observed patterns of trace element enrichment.

Pyritic samples from any deposit type will do, but general guidelines are:

- Pyrite formed below ~350°C is generally most informative. Pyrite from deposits with protracted mineralization histories is ideal.
- Pyrite from porphyry Cu and other higher temperature deposits (or highly metamorphosed deposits) contains fewer trace elements and is less suitable for this exercise. If used, choose samples from the fringes of porphyry deposits.
- Diagenetic pyrite may also have elevated trace element contents, although in most cases these will not be ore-related.
- Samples should ideally weigh <300 g, with pyrite grains up to 2 mm. Please avoid samples containing either coarse grained or abundant arsenopyrite.
- Samples should arrive no later than 5 weeks prior to the start of the short course.

Send pyrite samples to:

Dr Robert Scott
CODES, University of Tasmania
Clark Rd
Sandy Bay, Tasmania, AUSTRALIA 7005

Etched pyrite

RGB (ppm)

COURSE PRESENTERS

INVITED SPEAKERS

Shaun Barker is a senior lecturer at the University of Waikato. His research is focused on understanding controls on hydrothermal fluid flow in the crust, and the use of stable isotopes to investigate how the geometry and connectivity of fluid flow pathways changes over time. This research has implications for understanding precious metal mineralization in ore-forming hydrothermal systems, as well as active hydrothermal systems.

Phil Blevin is the Leader of Mineral Systems at the Geological Survey of NSW. He has extensive expertise in the relationships between igneous geochemistry and metallogeny in eastern Australia.

Stephen Cox is Professor at the Research School of Earth Sciences (ANU). His research focuses on understanding the coupling between seismic slip processes, fault strength, permeability enhancement and genesis of hydrothermal ore deposits in deforming rocks.

Scott Halley is a consultant specializing in exploration geochemistry, and in particular, the use of multi-element ICP geochemistry and SWIR analysis to map far-field expressions and alteration mineral zonation patterns around hydrothermal systems.

Nick Oliver is Principal and Consultant HCOV Global. He specializes in combining structural and geochemical approaches to understanding ore deposits and their associated hydrothermal systems.

Lesley Wyborn is an Adjunct Fellow at the National Computational Infrastructure Facility and Research School of Earth Sciences (ANU). She is a specialist in Proterozoic granite geochemistry and metallogeny, and information systems.

CODES PRESENTERS

Mike Baker, Ron Berry, Tony Crawford, David Cooke, Leonid Danyushevsky, Sebastien Meffre, Paul Olin, Robert Scott, Jeff Steadman, Lejun Zhang

TRAVEL AND ACCOMMODATION

Participants are responsible for their own travel to and from, and accommodation in, Hobart.

MASTER OF ECONOMIC GEOLOGY PROGRAM

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

This coursework-based Masters program is aimed at geoscientists seeking 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 program, jointly offered by the University of Tasmania, the University of Western Australia and James Cook University, in conjunction with the Business School at Curtin University.

Course structure

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

Option 1: Completion of 6 coursework units and a 2 unit research thesis. Four of the coursework units must be undertaken at CODES; the remaining two may be completed at either CODES or the other participating universities. Duration: 18–24 months full-time; up to 30 months part-time (flexible in recognition of industry participants).

Option 2: Completion of 8 course workunits, at least 4 of which must be undertaken at CODES. Duration: up to 30 months part-time (flexible in recognition of industry participants).

Course content

Participating universities offer up to seven intensive short course style units annually, or in rotation over a two-year period. Most units are two weeks in duration.

Units offered by CODES

- Ore deposit models and exploration strategies (KEA712/KEA701): next offered Oct 2018
- Ores in magmatic arcs (KEA707/KEA706): next offered Mar 2019
- Ore deposit geochemistry, hydrology and geochronology (KEA709/KEA704): 12 – 23 Jun, 2017
- Volcanology and mineralisation in volcanic terrains (KEA708/KEA703): next offered Mar 2018
- Exploration in brownfield terrains (KEA710/KEA705): next offered Jun 2018

Fees

UTAS tuition fees are approx. $2262 per unit (8 in total) for domestic students and $7312 (AUD) per unit for full-fee paying overseas students (FFPOS). Field-based courses have additional costs. Fees vary at other MGM partner institutions. International students should refer to http://www.international.utas.edu.au/ or contact the Masters Coordinator for more information (see page 4 for contact details).
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<th>Session</th>
<th>Speaker(s)</th>
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<td>Monday 12 June</td>
<td>Introduction to the chemistry of hydrothermal fluids</td>
<td>(David Cooke)</td>
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<td>Tuesday 13 June</td>
<td>Hydrology, fluid-rock interaction and breccia development in hydrothermal/magmatic-hydrothermal systems</td>
<td>(Nick Oliver)</td>
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<td>Wednesday 14 June</td>
<td>Granites and granite metallogeny</td>
<td>(Phil Blevin, Lesley Wyborn)</td>
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<td>Thursday 15 June</td>
<td>Arc magmatism and lithogeochemistry</td>
<td>(Tony Crawford)</td>
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<td>Alteration geochemistry and mass balance</td>
<td>(Robert Scott)</td>
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<td>Friday 16 June</td>
<td>Mineral chemistry vectoring in porphyry and epithermal environments</td>
<td>(David Cooke, Mike Baker, Lejun Zhang)</td>
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<td>Saturday 17 June</td>
<td>Geochronology of magmatic-hydrothermal systems</td>
<td>(Sebastien Meffre, Ron Berry, Paul Olin)</td>
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<td>Sunday 18 June</td>
<td>Private study</td>
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<td>Monday 19 June</td>
<td>Application of pyrite trace element chemistry to studies of ore deposit genesis and mineral exploration</td>
<td>(Robert Scott, Scott Halley, Leonid Danyushevsky, Jeff Steadman)</td>
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<td>Tuesday 20 June</td>
<td>Enhanced geochemical exploration</td>
<td>(Scott Halley)</td>
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<td>Wednesday 21 June</td>
<td>Stable isotopes</td>
<td>(Shaun Barker, David Cooke)</td>
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<td>Thursday 22 June</td>
<td>Physical hydrology of fracture-controlled hydrothermal systems</td>
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<td>Isotopic evolution of structurally-contolled fluid pathways</td>
<td>(Stephen Cox, Shaun Barker)</td>
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<td>Friday 23 June</td>
<td>Fluid inclusions</td>
<td>(David Cooke)</td>
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<td>MGM student presentations and wrap-up</td>
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REGISTRATION FORM

PERSONAL DETAILS
Title – please circle (Prof / Dr / Mr / Mrs / Ms / Miss)
First name .............................................. Last Name (Family name) ..............................................................
Preferred name (for name tag)............................ Position ..............................................................
Company / affiliation ..............................................................
Address ..........................................................................
City .................. State .............. Country ......................... Postcode / ZIP ..........................
Email .............................................................. Mobile / cell phone ..............................................................
Phone (home) .............................................. Phone (work) ....................................... Fax ..................................
Dietary requirements / allergies ..............................................................

REGISTRATION FEES
Fees are in Australian dollars and include 10% GST. Please tick box.

Minerals Geoscience Masters students
☐ Tuition fee only
☐ Course dinner – Saturday 17 June ($66)

Industry participant
☐ Full course ($3,960)
☐ ….. days at $660/day
☐ Course dinner – Saturday 17 June ($66)

CODES staff / students
☐ Free (indicate days below)
☐ Course dinner – Saturday 17 June ($66)

Other students
☐ Full course ($660)
☐ Course dinner – Saturday 17 June ($66)

PLEASE NOTE:
Participants NOT attending entire course, please circle selected days
Week 1: 12 13 14 15 16 17 June
Week 2: 19 20 21 22 23 June

PAYMENTS
Registrations (with full payment) must be received before June 12, 2017.
Non-MGM students must provide proof of student status to obtain discount.

TOTAL AMOUNT DUE: $ .........................................................

Payment options (please tick box)

☐ Credit card (VISA/Mastercard only)
Payment reference number and web address for on-line payments will be issued upon receipt of your registration form.

☐ Cheque or Bank Draft
Please make payable to “The University of Tasmania”. Bank drafts must be made out in Australian currency.

☐ Purchase Order
UTAS Account Number .........................................................

☐ Invoice
Please provide name and address of person/company to whom invoice should be sent. If same as above write “as above”.

MGM STUDENTS: THIS FORM DOES NOT CONSTITUTE AN OFFICIAL UNIVERSITY ENROLMENT – YOU MUST ALSO ENROL THROUGH YOUR HOME INSTITUTION