



Future Understanding of Tectonics, Ores, Resources, Environment and Sustainability

Porphyry-Epithermal Cu-Au Deposits: Tectonomagmatic Controls on Magma Fertility and Deposit Localisation

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Location:

Rydges Southbank Townsville
Savoy Room
23 Palmer St
Townsville

Date:

Sunday 4 June 2017

Time:

9 am - 5pm

Catering

Fully catered

Parking

Available in the Rydges car park, Palmer St or behind Rydges in McIlwraith St

Course Description

Objectives

This 1-day short course will review the large-scale tectonic, magmatic, temporal, and spatial controls on the formation of porphyry and related epithermal deposits in both subduction and post- or distal subduction settings.

Who Should Attend

The course is designed for practicing exploration geologists who are looking for an update on current tectonomagmatic models for porphyry-epithermal ore-formation, and graduate-level students of economic geology.

What You Will Learn

- Geochemical controls on and symptoms of magma fertility.
- Tectonomagmatic controls on the formation of fertile magmas in subduction and post- or distal subduction settings.
- Tectonic controls on the emplacement of fertile magmas in the upper crust.

Program

Morning: Magma Fertility

Porphyry Cu deposits are associated with hydrous, oxidized, calc-alkaline to mildly alkaline magmas, formed in subduction and post- or distal subduction settings, reflecting the high water content and oxidation state of the upper mantle in such environments. Various geochemical and mineralogical parameters can be used to identify magmas that are fertile for porphyry ore-formation, and to preclude infertile suites.

Afternoon: Tectonic Controls on Magma Emplacement and Porphyry Formation

Magma buoyancy and tectonic stress conditions constrain the way in which arc magmas first pool at the base of the crust and then rise towards the surface. Pre-existing structures may localize the ascent and emplacement of magmas in the upper crust under transpressional (or transtensional) stress fields.

Presenter

Jeremy Richards

Jeremy Richards is a Professor of Economic Geology at Laurentian University (Sudbury, Canada), and is a registered professional geologist. He received a BA in geology from Cambridge University in 1983, an MSc from the University of Toronto in 1986, and a PhD from the Australian National University in 1990. He was appointed as Lecturer at the University of Leicester, UK, in 1992, and joined the University of Alberta in 1997. He was appointed as a Canada Research Chair in Metallogeny at Laurentian University in 2017. His research interests focus on the genesis of hydrothermal mineral deposits, and in particular regional tectonic and magmatic controls on porphyry and epithermal mineralization. He also pursues research in sustainable development as applied to the minerals industry.

He is currently an associate editor of the journal *Economic Geology*, and was previously editor of the journal *Exploration & Mining Geology* and associate editor of the *Economic Geology 100th Anniversary Volume* and *Mineralium Deposita*. He was co-editor of two Reviews in *Economic Geology* volumes, and chief editor of *Society of Economic Geologists Special Publication 19*.

He received the Society of Economic Geologists Lindgren Award in 1995, and Silver Medal in 2016; he was the SEG 2002/2003 International Exchange Lecturer, and the 2016 Thayer Lindsley Visiting Lecturer. He has also received the Geological Association of Canada Hutchison Medal in 2007, and the Canadian Institute of Mining and Metallurgy Julian Boldy Memorial Award in 2007.