

UNSW-SMEDG Short Course 5-6 October 2017

1.5 day Short Course: Regional Tectonomagmatic and Local Magmatic and Hydrothermal Controls on Porphyry and Epithermal Mineralization

**Presenter: Professor Jeremy P. Richards (Ph.D., P.Geo.)
Laurentian University**

This 1.5 day short course will run from 1pm on Thursday 5th October to 5 pm and from 9 am to 5 pm on Friday 6th October.

**Venue: Room 449, Biological Sciences Link Wing
Upper campus, UNSW Sydney**

(NOTE: a map and directions will be provided a few days before workshop to participants)

University of New South Wales Sydney

Cost: \$600.00 (includes morning and afternoon teas)

Limited to the first 30 registrations

Register at:

What You Will Learn

- **The tectonomagmatic context of subduction-related and post-subduction porphyry and related epithermal deposits: an understanding of why some arc suites are highly prospective and others are seemingly barren.**
- **System- and local-scale controls of ore-formation in porphyry and epithermal systems: an appreciation of the controls on ore grade and tonnage.**
- **Linkages between porphyry, epithermal, and certain types of IOCG deposits: deposit associations.**



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Jeremy Richards is Canada Research Chair in Metallogeny at Laurentian University, Sudbury, Ontario, 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 where he worked as a Professor in Economic Geology before moving to 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*. He was previously chief editor of a Society of Economic Geologists Special Publication on Tethyan Tectonics and Metallogeny (2016), editor of the journal *Exploration & Mining Geology*, and was associate editor of the *Economic Geology 100th Anniversary Volume* and *Mineralium Deposita*.

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 SEG 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.

SHORT COURSE OUTLINE

1. Arc Magmatism

Petrogenetic and metallogenic processes in arc magmatism are reviewed, and the suggested role of adakites (slab melts) in porphyry Cu genesis is critically examined. Alternative models of crustal interaction (e.g., MASH processes) are presented in the context of northern Chilean magmatism and porphyry Cu formation.

2. Arc Tectonics and Magma Emplacement

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. Examples from Chile and Argentina are reviewed.

3. Upper Crustal Magmatic Processes

Mid-to-upper crustal magma chamber processes that result in formation of shallow-level apophyses and the focusing of volatile release are reviewed. The scale of magmatism required to supply metal to large porphyry Cu deposits is examined, and compared with observations from active and fossil magmatic systems. The role of volcanism is considered.

4. Porphyry Cu-forming Processes

Processes of volatile exsolution and release in the cupola zone are reviewed, and the resultant processes of hydrothermal alteration and mineral deposition are examined.

5. Epithermal and Post-Subduction Deposits, including IOCG deposits

The link between porphyries and shallow-level epithermal and fumarolic systems is explored. Porphyry and epithermal ore formation in post-subduction settings is reviewed as a new exploration target.