BHP Billiton is proud to support SEG 2015: World-Class Ore Deposits: Discovery to Recovery, hosted by the Society of Economic Geologists.

BHP Billiton is a leading global resources company. We are among the world’s largest producers of major commodities, including iron ore, coal, copper, nickel and uranium and have substantial interests in oil and gas.

Headquartered in Melbourne, BHP Billiton has a global presence through the ownership and operation of assets diversified by commodity, geography and market. Our unrivalled portfolio of high-quality growth opportunities ensures we continue to meet the changing needs of our customers and the resources demand of emerging economies at every stage of their growth. We are proud to supply the resources needed to support global economic growth and development. We are committed to making a broader contribution through our social investments which aim to deliver lasting economic and social benefits for the communities where we operate.
### Sunday

**Student Mentoring Forum**
2:30pm – 4:15pm

**Presidential Address and Silver Medal Award**
4:15pm – 5:00pm

**Welcome Reception, Exhibits, and Posters**
5:00pm – 7:00pm
Exhibition Foyer, Boardwalk Gallery, and Wellington Rooms

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### Monday

**Welcome**
Bruce Gemmell, Chairman
Organizing Committee
8:15am – 8:30am
Auditorium

**Plenary-Keynote Session**
8:30am – 10:00am
Auditorium

**Morning Break**
10:00am – 10:30am
Boardwalk Gallery and Wellington Rooms

**Trifecta Technical Session**
10:30am – 12:30pm
Olympic Dam IOCG Deposit
Red Dog SEDEX Deposit
Auditorium

**Lunch**
12:30pm – 1:30pm
Boardwalk Gallery and Wellington Rooms

**Technical Sessions**
1:30pm – 3:00pm
Auditorium and Tasman Rooms

**Afternoon Break**
3:00pm – 3:30pm
Boardwalk Gallery and Wellington Rooms

**Trifecta Technical Session**
3:30pm – 4:30pm
Auditorium and Tasman Rooms

**Reception, Exhibits, Posters**
4:30pm – 6:30pm
Exhibition Foyer, Boardwalk Gallery and Wellington Rooms

**Evening at MONA Reception and Cocktails**
6:30pm – 10:00pm

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### Tuesday

**Plenary-Keynote Session**
8:30am – 10:00am
Auditorium

**Morning Break**
10:00am – 10:30am
Boardwalk Gallery and Wellington Rooms

**Trifecta Technical Session**
10:30am – 12:30pm
Pebble Porphyry Deposit
Ladolam Epithermal Deposit
Auditorium

**Lunch**
12:30pm – 1:30pm
Boardwalk Gallery and Wellington Rooms

**Technical Sessions**
1:30pm – 3:00pm
Auditorium and Tasman Rooms

**Afternoon Break**
3:00pm – 3:30pm
Boardwalk Gallery and Wellington Rooms

**Trifecta Technical Session**
3:30pm – 4:30pm
Auditorium and Tasman Rooms

**Reception, Exhibits, Posters**
4:30pm – 6:30pm
Exhibition Foyer, Boardwalk Gallery and Wellington Rooms

**Industry Outlook Dinner**
7:00pm – 10:00pm
Derwent Room

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### Wednesday

**Plenary-Keynote Session**
8:30am – 10:00am
Auditorium

**Morning Break**
10:00am – 10:30am
Boardwalk Gallery and Wellington Rooms

**Technical Sessions**
10:30am – 12:30pm
Auditorium and Tasman Rooms

**Lunch**
12:30pm – 1:30pm
Boardwalk Gallery and Wellington Rooms

**SEG Awards and Student Presentation Prizes**
1:30pm – 2:30pm
Auditorium

**Controversies Session**
2:30pm – 3:30pm
Auditorium

**Afternoon Break**
3:30pm – 4:00pm
Boardwalk Gallery and Wellington Rooms

**Technical Sessions**
3:30pm – 4:30pm
Auditorium and Tasman Rooms

**Controversies Panel**
4:00pm – 5:00pm
Auditorium

**Closing Remarks**
5:00pm – 5:15pm
Auditorium

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All sessions and social events are held at the Wrest Point Conference Centre, with the exception of the Monday evening reception at the Museum of Old and New Art (MONA).
Welcome Down Under!

Welcome to the SEG-CODES
2015 Conference in Hobart, Tasmania!

The conference, World-Class Ore Deposits: Discovery to Recovery, is jointly hosted by the Society of Economic Geologists and the ARC Centre of Excellence in Ore Deposits (CODES) at the University of Tasmania, Australia. The theme encompasses exploration/discovery and geosciences, with geometallurgy, for a range of deposit types and major mines/districts.

The technical program of outstanding speakers and poster presenters focuses on areas of research in economic geology that can lead to the important practical issues of improved exploration concepts, discovery, mine geology, and recovery (geometallurgy).

We have included a new style of keynote presentation, with talks on the discovery, geology, and geometallurgy of four styles of world-class mineral deposits. The technical talks will be supplemented by related poster sessions. There is an impressive range of short courses and field trips that will visit major mining districts in Australia, New Zealand, and Indonesia.

Student participation is a key element of the meeting, with a pre-conference student mentoring forum and significant student involvement in the technical program. A big thank you to the Conference sponsors who have generously contributed during difficult times for the mineral industry. Their generosity directly funds student participation and programs.

On behalf of the Organizing Committee, we welcome you to SEG 2015 and to this unique part of the world. We trust you will enjoy the conference and the best Tasmania and Australia have to offer — geology, mineral deposits, food, wine, beaches, and wilderness!

J. Bruce Gemmell, Chairman,
SEG 2015 Organizing Committee

Brian G. Hoal, Executive Director,
Society of Economic Geologists
# Conference Information*

**Organizing Committee Members**
- Conference Chairman: Bruce Gemmell, CODES, University of Tasmania
- Brian Hoal, Executive Director, Society of Economic Geologists
- Technical Sessions: Noel White, Consultant
- Posters/Students: Patrick Sack, Yukon Geological Survey
- Workshops/Short Courses: Zhaoshan Chang, James Cook University
- Field Trips: Garry Davidson, CODES, University of Tasmania
- Sponsorship/Marketing: Dan Wood, Consultant
- Exhibits/Administration: Carol van ‘t Veld, Conference Design Pty Ltd.
- Secretary/Students: Christine Horrigan, Society of Economic Geologists

**SEG Contact Information**
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Conference Design Pty Ltd.
Carol@conferencedesign.com.au
Tel. +61 3 6231 2999

Wrest Point Conference Centre will provide Internet Service at no cost.

*For registration, exhibit, and speaker ready room hours, as well as an overview of schedules, please see the inside front cover of this program. An Exhibit Booth floor plan is located inside the back cover. All events, except where noted, will be held at the Centre.
Pre-Conference Program

Sunday, September 27, 2015

Student Mentoring Forum, Presidential Address, and SEG Silver Medal Award Presentation
2:30 pm – 5:00 pm
Auditorium, Wrest Point Conference Centre

Student Mentoring Forum

Hosted by bhpbilliton

Presidential Address: François Robert, *Importance of the Geology Part of Economic Geology*
Silver Medal Presentation

Forum Panel

Kathy J. Ehrig, Principal Geometallurgist, BHP Billiton
Vanessa Guthrie, CEO, Toro Energy Ltd.
T. Campbell (Cam) McCuaig, Centre for Exploration Targeting, University of Western Australia
James Johnson, Deputy CEO and Chief of Energy Division, Geoscience Australia
James Macdonald, Director at C2Skyle Management Ltd.
Andrew Davies, Chief Geoscientist, Teck Resources Limited

Welcome Reception

5:00 pm – 7:00 pm
Boardwalk Gallery and Wellington Rooms
Poster Viewing — Exhibition Foyer
Pre-Conference Field Trips: Dates as Noted

**VHMS and Granite-Related Ore Deposits of Western Tasmania**  
Field Trip Leaders: Andrew McNeill, Bruce Gemmell, and Ralph Bottrill  
**September 22–27**

**Deposits of the Gold-Rich Ordovician Alkalic Porphyry and Epithermal Province, Macquarie Arc, New South Wales**  
Field Trip Leaders: Anthony Harris and Nathan Fox  
**September 23–25**

Pre-Conference Short Courses

**Uranium Geology**  
8:00 am  
**September 26–27**  
Presenters: David Thomas (organizer), Gerard Zaluski, Penny Large, Tom Kotzer, and Andrew Fitzpatrick  
Wrest Point, Derwent Room 1

**Ore Deposits, Atmosphere**  
8:30 am  
**September 26–27**  
Oxygenation and Evolution of Life; How They are Related. New Genetic and Exploration Insights  
Presenters: Ross Large (organizer), Kurt Konhauser, Peter McGoldrick, John Long, Valeri Maslennikov, James Farquhar, and Tim Lyons  
UTAS—CODES Conference Room, Geology Building

**Understanding Alteration – Use in Exploration & Development**  
8:00 am  
**September 26–27**  
Presenters: John Thompson and Anne Thompson (course leaders), Bruce Gemmell, Andrew Davies, and Jim Lang  
UTAS—Room 211, Geology Building

**Skarn Deposits**  
8:30 am  
**September 27**  
Presenters: Zhaoshan Chang (organizer) and Larry Meinert  
Wrest Point, Derwent Room 2

Technical Program

Talks for which the presenting author is a student can be identified by an asterisk (*) after the title. Names of invited speakers are highlighted.

**Day 1: Monday, September 28, 2015**

**Auditorium**

**Welcome and Introduction** .......................................... 8:15 am  
J. Bruce Gemmell, Conference Chairman  
CODES, University of Tasmania

**Plenary-Keynote Session**

**Chair: J. Bruce Gemmell, CODES**

**What industry wants from research** ......................... 8:30 am  
Paul Agnew, Rio Tinto

**What research can deliver for industry** ..................... 9:00 am  
Murray W. Hitzman, Colorado School of Mines

**Exploration—the role of innovation** ....................... 9:30 am  
John F.H. Thompson, Cornell University; PetraScience Consultants

**BREAK 10:00 AM**

**Trifecta Talks on Discovery, Exploration, and Geometallurgy**

**Chair: Noel White, Consultant**

**Olympic Dam Fe Oxide Cu-U-Au-Ag Deposit:**  
10:30 am  
Discovery to Recovery (BHP Billiton)  
Kathy Ehrig, Vadim S. Kamenetsky, Maya Kamenetsky, Nigel J. Cook, Cristiana L. Ciobanu, and Douglas Haynes

**Red Dog: From Discovery to Recovery**  
11:30 am  
Above the Arctic Circle (Teck)  
Andrew Davies, Nick Hayward, and Anelda van Staden

**LUNCH 12:30 PM**  
(Boardwalk Gallery and Wellington Rooms)
Four (4) Concurrent Technical Sessions
(Auditorium and Tasman Rooms)

Session 01: Ores in subduction-related arcs: New examples; relations and controls (Aud)
Chair: David Cooke, CODES, University of Tasmania
Overview of the tectonic setting and geology of porphyry copper-gold deposits along the eastern Sunda Magmatic Arc, Indonesia
Adi Maryono
Dynamics of fluid pathways and fluid flow in intrusion-related hydrothermal systems: Insights from ore deposits, seismicity, and numerical modeling
Stephen Cox, A. Flatten, and D. Beck
Stretched to the limit: An extensional detachment setting for the Gosowong epithermal goldfield, Halmahera, Indonesia
David Selley, N. Jansen, D. Silitonga, A. Bambang, D. Wardiman, N. Fitzpatrick, and A. Harris
Hydrothermal transport of Ag, Au, Cu, Te, and other metals in high-temperature geothermal systems, North Island, New Zealand: Implications for genesis and exploration of epithermal deposits
Stuart Simmons, K. Brown, and B. Tutolo

Session 02: SGA Session on exploration under cover (Tas A)
Chair: Roger Skirrow, Geoscience Australia
Complex mineral systems and scale reduction in mineral exploration under cover: Can prospecting drilling bridge the critical gap between camp and deposit scale?
David Giles, R. Hillis, A. Fabris, S. van der Wielen, J. Cleverley, and S. Halley
Crustal architecture and under cover: The Granites-Tanami orogen example*
David Stevenson, L. Iaccheri, L. Bagas, C. McCuaig, and A. Aitken
Using 3D computational modeling to represent deep structures and facilitate ore prediction: An example from Tongling orefield, China
Liangming Liu, Wei Cao, and Jianqing Wang

Session 03: Geometallurgy through the mining chain (Tas B)
Chair: Julie Hunt, University of Liege, Belgium
Embracing step-changes in geoscientific inputs for effective implementation of geometallurgy
Stephen Coward and H. Pass
Geometallurgy at Tropicana: Mine to mill implementation
Peter Ketelaar, B. Catto, M. Carey, and D. Lawie
Application of GeoMet to iron ore mine geology and planning at BHP Billiton Iron Ore
Bryan Wright, A. Rigby, T. Sua, M. Flanagan, and B. Van Dijken
Using geochemistry to inform geometallurgy at the Productora Cu-Au-Mo deposit, Chile*
Angela Escolme, R. Berry, J. Hunt, and W. Potma

Session 04: Mining geology (Tas C)
Chair: Margaretha Scott, Sustainable Minerals Institute, University of Queensland-St. Lucia
The impact of collaborative research to the mining value chain
Colin Moorhead and A. Harris
Applications of UAVs in mining geology and mineral exploration*
Stefan A. Vollgger, S. Micklethwaite, and A. Cruden
Exploring for ore
Dan Wood
Value creation as a guide for advanced exploration at Conchi porphyry copper deposit, Chile: A case study and methodology for integration of technical and economic variables
Aquiles Gonzalez, R. Aguirre, and F. Bernal

DISCUSSION/QUESTIONS 2:50 PM
BREAK 3:00 PM
Four (4) Concurrent Technical Sessions
(Auditorium and Tasman Rooms)

Session 05: Ores in subduction-related arcs:
New examples; relations and controls (Aud)
Chair: David Cooke, CODES, University of Tasmania
Hydrothermal alteration of carbonaceous mudstones hosting the Eskay Creek Au deposit, British Columbia*
Tom Meuzelaar and T. Monecke
Trace elements in pyrite in the Lepanto high sulfidation epithermal deposit, Philippines, and genetic implications
Zhaoshan Chang, J. Hedenquist, N. White, D. Cooke, and L. Burley
Hypogene and exotic copper mineralization at the Mercedario porphyry copper deposit, Central Andes, Argentina
Alan Wilson

Session 06: SGA Session on exploration under cover (Tas A)
Chair: Roger Skirrow, Geoscience Australia
Multiscale detection of buried mineralization through transported cover
Robert Hough and R. Anand
Lithospheric electrical resistivity heterogeneity: A vector to mineralization
Graham Heinson, P. Soeffky, and S. Thiel
Ongoing discovery in the gold deposits at Dead Bullock Soak, Tanami Orogen, Northern Territory: The emergence of a world-class gold camp
Matthew Baggott, S. Schmeider, J. Pendergast, C. Robinson, and P. Sivwright

Session 07: Geometallurgy through the mining chain (Tas B)
Chair: Julie Hunt, University of Liege, Belgium
Establishing the geometallurgical flow sheet for industrial mineral operations
Aleksandra Lang, S. Løve Ellefmo, and K. Aasly
The geometallurgy of arsenic in copper ores: An analysis of ore supply vs. smelter treatment capacity and implications for exploration models and deposit valuations
Alan Riles
Using assay data to map mineralogy and alteration to help develop a predictive geometallurgical model for the Taca Taca Cu-Mo-Au porphyry deposit, Argentina
Gisela Cobeñas and S. Halley

Session 08: IOCG and magnetite-apatite deposits: Similarities, differences, controls and genesis (Tas C)
Chair: Garry Davidson, CODES, University of Tasmania
A process-based explanation for IOCG diversity
Nicholas Oliver
Shallow to deep crustal controls on localization of Mesoproterozoic iron oxide copper-gold-rare earth element deposits in southeast Missouri (USA): Evidence from gravity and magnetic data
Anne McCafferty and J. Phillips
Fe-Cu mineralization in the Paleozoic Aqishan-Yamansu belt, Eastern Tianshan, China: Comparison to the Mesozoic Central Andean IOCG mineralization and Chilean iron belt
Huayong Chen, J. Han, and X. Xiong

RECEPTION 4:30–6:30 PM
(Exhibits and Posters)

EVENING AT MONA 6:30–10:00 PM
(Museum of Old and New Art)
Day 2: Tuesday, September 29, 2015

Auditorium

Plenary-Keynote Session

Chair: Zhaoshan Chang, James Cook University

The emergence and continuing evolution of geometallurgy: What every economic geologist should know about improving project value
Steve Walters, CRC ORE

Developments in seafloor mineralization of intraoceanic arcs
Cornel E.J. de Ronde, GNS Science

High-resolution VNIR-SWIR core logging: A revolutionary new tool for exploration, mining, and research
Anthony C. Harris, Ronell Carey, John R. Holliday, and Fraser MacCorquodale, Newcrest Mining Ltd.

BREAK 10:00 AM

Trifecta Talks on Discovery, Exploration, and Geometallurgy

Chair: Dan Wood, Consultant

Pebble Porphyry Deposit (Northern Dynasty Minerals) 10:30 am

• Discovery of the Pebble porphyry Cu-Au-Mo deposit, southwest Alaska: History and exploration methods
  Mark Rebagliati and James R. Lang

• Geology of the Pebble porphyry Cu-Au-Mo deposit, southwest Alaska
  Brian A. McNulty, James R. Lang, Melissa J. Gregory, Cassady L. Harraden, Nansen H. Olson, and Mark Rebagliati

• Delineation of geometallurgical domains in the Pebble porphyry Cu-Au-Mo deposit, Alaska
  Cassady L. Harraden and Melissa J. Gregory

The Giant Ladolam Gold Deposit (Newcrest) 11:30 am

• Unlocking the giant Ladolam gold deposit: Discovery through to recovery
  Nicholas Fitzpatrick and Anthony C. Harris

• Unlocking the giant Ladolam gold deposit: New insights into its geology
  William J. Clark, Fiona Karaut, Nicholas Fitzpatrick, Paul Napier, and Anthony C. Harris

LUNCH 12:30 PM

Four (4) Concurrent Technical Sessions

Session 09: Ores in sedimentary environments: New examples; sources, transport, deposition and hydrology (Tas A)

Chair: Ross Large, CODES, University of Tasmania

Are there Carlin-type gold deposits in China? 1:30 pm
Similarities and differences between deposits of Guizhou, China, and Nevada, USA
Jean Cline, Z. Xie, and Y. Xia

The Luxi gold belt of southwest China’s Yunnan Province: A true analogue for “Carlin” (Nevada) style gold mineralization?
Lee Barker

Still stuck in the mud: Reevaluation of stratiform gold in the Upper Popovich Formation, Northern Carlin Trend, Nevada
Robert Scott, P. Emsbo, and K. Goemann

Fingerprinting mineralization in the North 2:30 pm
Australia Craton during the amalgamation and breakup of the Nuna/Columbia Supercontinent
Alexis Lambeck, D. Huston, G. Gibson, and K. Barovich

Session 10: Mining geology (Tas C)

Chair: Margaretha Scott, Sustainable Minerals Institute, University of Queensland

Deformation and stratigraphic architecture 1:30 pm
of the Golden Grove volcanogenic massive sulfide deposits, Western Australia
Anthony Morey, S. Gawinski, S. Neal, J. Vearncombe, M. Van Heerden, L. Williams, and T. King
Mount Isa Mines: Exploration from a mining perspective
Daniel Taylor

Challenges of accurately characterizing the ore and host rocks of deep mineral discoveries
Anthony Webster and T. Murphy

Engineering geology applied to rock mechanics and planning process during cave mining at the El Teniente mine
Andres Brzovic, P. Schachter, J. Seguel, A. Alvarez, and K. Baraona

Session 11: Post-collisional ores: New examples; characteristics, relationships and genesis (Tas B)
Chair: Anthony Harris, Newcrest Mining Ltd.

Origin of postcollisional porphyry Cu-Mo deposits in the Eastern Gangdese belt, Southern Tibet
Rui Wang, J. Richards, Z. Hou, and Z. Yang

High magmatic water content disproves genesis of post-collisional copper ore-forming high Sr/Y magmas by dehydration melting of lower crust
Yongjun Lu, R. Loucks, M. Fiorentini, Z. Yang, and Z. Hou

High-precision Re-Os molybdenite ages for porphyry- and skarn-style Cu-Au mineralization at Ok Tedi, Papua New Guinea
Peter Pollard, R. Smillie, H. Stein, and D. Hastings

Tourmaline mineral chemistry as a tool to discriminate mineralized from barren Sn granites, western Tasmania, Australia*
Wei Hong, D. Cooke, L. Zhang, N. Fox, and J. Thompson

Session 12: Magmatic deposits: New examples; characteristics and mechanisms (Aud)

Sulfur transfer into mafic magma from sediment—reaction of sedimentary sulfides with and into mafic magmas
Sarah-Jane Barnes and N. Samalens

Crustal-scale magma flow networks and magmatic ore deposits: Predicting needles in haystacks
Alexander Cruden, S. Barnes, B. Saumur, and J. van Otterloo

Concentrating sulfide melts in active magma pathways using chaotic mixing
Jess Robertson, S. Barnes, and G. Metcalfe

Physical controls of nucleation, growth, and migration of vapor bubbles in partially molten cumulates
James Mungall

DISCUSSION/QUESTIONS 2:50 PM
BREAK 3:00 PM

Four (4) Concurrent Technical Sessions (Auditorium and Tasman Rooms)

Session 13: Ores in sedimentary environments: New examples; sources, transport, deposition and hydrology (Tas A)
Chair: Ross Large, CODES, University of Tasmania

The trace element content of sedimentary pyrite in the Neoarchean, an example from the mineralized St Ives Au district and the unmineralized Bee Gorge Member: Implications for future gold exploration

Chemistry of pyrite from the Selwyn basin area, Yukon: From established SEDEX zinc district to emerging sediment-hosted gold district
Patrick Sack, R. Large, M. Nordling, E. Loumejeva, and L. Danyushevsky

A new genetic model for mineralization in the Irish Zn-Pb Orefield
Jamie Wilkinson and M. Hitzman

Session 14: IOCG and magnetite-apatite deposits: Similarities, differences, controls and genesis (Tas C)
Chair: Garry Davidson, CODES, University of Tasmania

The magmatic-hydrothermal evolution of the El Laco recent iron oxide deposit
Fernando Tornos, F. Velasco, and J. Hanchar
End-Permian mineralized phreatomagmatic pipes of the Tunguska Basin: Volcanogenic IOCG deposits linked with the Siberian Traps Large Igneous Province Alexander Polozov, H. Svensen, S. Planke, and D. Jerram

The evolution and potential sources of... 4:10 pm mineralizing fluids of the E1 Group of IOCG deposits, Cloncurry District, Northwest Queensland, Australia: Implications from fluid inclusion and SHRIMP S isotope analyses* George Case, Z. Chang, J. Huizenga, R. Lilly, and T. Blenkinsop

Session 15: Post-collisional ores: New examples; characteristics, relationships and genesis (Tas B) Chair: Anthony Harris, Newcrest Mining Ltd.

Propylitic alteration and metal mobility in porphyry systems: A case study of the Northparkes porphyry Cu-Au deposits, NSW, Australia* Adam Pacey, J. Wilkinson, and D. Cooke

High-K to shoshonitic magmatism across the northern Archean Kéména Man margin (Guinea): Implications for the late Eburnean orogenic gold mineralization Aurélien Eglinger, N. Thébaud, J. Davis, J. Miller, A. Zeh, C. McCuaig, and E. Belousova

Nanoparticles are the key to forming giant gold deposits Mark Pearce, M. Gazley, L. Fisher, M. Saunders, R. Hough, and C. Kong


The Vologochan deposit as a new... 3:30 pm important Cu-Ni-PGE source in the Noril'sk district, Russia: Geological structure, mineralogy, and geochemistry Nadezhda Krivolutskaya, A. Sobolev, K. Malitch, S. Sluzhenik, D. Kuzmin, I. Badanina, and N. Svirskaya

A quantitative analysis of the Ni-Cu-PGE-b... 3:50 pm bearing Parkin and Trill Offset Dikes, Sudbury Impact Structure, Canada* Adam Coulter, G. Osinski, M. Bertelli, A. McDonald, J. Bailey, A. Penték, and D. Smith

Spinel formation during thermomechanical... 4:10 pm erosion of footwall basalt beneath a sulfide melt pool at the komatiite-hosted Ni-Cu(-PGE) Moran deposit, Kambalda, Western Australia Sebastian Staude, M. LeVailant, and S. Barnes
Day 3: Wednesday, September 30, 2015

Plenary-Keynote Session

Alan Wilson, Antofagasta PLC

New insight into the links between major porphyry copper, IOCG, and magnetite-apatite deposits from the Gällivare area, northern Sweden
David Drejing-Carroll, Tobias Bauer, Peter Karlsson, David Coller, Roger Nordin, Murray Hitzman, and Rodney Allen

Trace element contents of magmatic sulfide and oxide minerals—how can we use this information in ore deposits studies?
Sarah-Jane Barnes (SEG 2015 Distinguished Lecturer), Université du Québec à Chicoutimi

Mineral sector value and risk in 4D: Discovery to dismantling
Allan Trench and John P. Sykes (SGA Lecture)

BREAK 10:00 AM

Four (4) Concurrent Technical Sessions
(Auditorium and Tasman Rooms)

Session 17: Magmatic deposits: New examples; characteristics and mechanisms (Aud)

Sulfur and metal fertilization of the lower continental crust

Evidence for fluid- and gas-driven magmatic Ni-Fe-Cu-PGE–rich sulfide ore deposition associated with mantle metasomatism in the Valmaggia ultramafic pipe, Ivrea-Verbano, Italy
Marilena Moroni, M. Fiorentini, S. Caruso, M. Frezzotti, and G. Sessa

A new type of PGE-rich sulfide mineralization in the lower troctolites from the Yoko-Dovyren layered intrusion (Southern Siberia, Russia)
Leonid Danyushevsky, A. Ariskin, G. Nikolaev, E. Kislov, S. Gilbert, K. Goemann, D. Hutchinson, and A. Malyshev

-effects of serpentinitization on dunite-hosted disseminated Ni sulfide ore, Agnew-Wiluna belt, Western Australia
Martin Gole

The Avebury nickel deposit, Tasmania
Australia: Further insights into the genesis of a significant unconventional nickel sulfide deposit
Reid Keays and B. Mackay-Scollay

Petrogenesis of the ferrogabbroic intrusions and associated Fe-Ti-V mineralization within the McFaulds Greenstone Belt, Superior Province, Ontario, Canada
Peter Hollings, B. Kuzmich, and M. Houlé

Session 18: IOCG and magnetite-apatite deposits: Similarities, differences, controls and genesis (Tas C)
Chair: Garry Davidson, CODES, University of Tasmania

Insights into zonation within the Olympic Dam Cu-U-Au-Ag deposit from trace element signatures of sulfide minerals
Nigel Cook, C. Ciobanu, and K. Ehrig

The potential of iron oxide U-Pb geochronology—examples from the Olympic Dam IOCG deposit, South Australia
Cristiana Ciobanu, N. Cook, K. Ehrig, B. Wade, and V. Kamenetsky

The supergiant Olympic Dam Cu-U-Au-Ag ore deposit: Toward a new genetic model

Volcanosedimentary and chronostratigraphic architecture of the host rock succession at Prominent Hill, South Australia
Stuart Bull, S. Meffre, M. Allen, H. Freeman, M. Tomkinson, and P. Williams

Mineralization and paragenesis of the South Vulcan IOCG prospect, South Australia
Gregory Clarke, G. Davidson, S. Bull, R. Smith, and M. Croaker
Session 19: Ores in sedimentary environments: New examples; sources, transport, deposition and hydrology (Tas A)

Chair: Ross Large, CODES, University of Tasmania

Ore controls in the White Mountain breccia-hosted gold deposit, Jilin Province, Northeastern China*

Hot and acidic—the geochemistry of vent fluids from shale-hosted massive sulfide deposits at Macmillan Pass, Selwyn Basin*
Joseph Magnall, S. Gleeson, and S. Paradis

Sediment-hosted Cu in Zambia: Mineralization controlled by ductile deformation, basin architecture, or both?
Clemens Augenstein, D. Wood, M. Hitzman, J. Beeson, and D. Jack

Implications of Paleozoic flora and fauna in the northern Katanga Basin for sedimentation and mineralization in the Central African Copperbelt
Tim Ireland, I. Stefanov, W. Zukowski, and T. Jelezarsky

Primary metal enrichment at the black shale-hosted Talvivaara Ni-Zn-Cu-Co-U deposit, Finland: Links to Paleoproterozoic seawater?*
Sean Johnson, R. Large, P. McGoldrick, A. Boyce, S. Meffre, and A. Kontinen

Rethinking models for Phanerozoic orogenic gold deposits
James Mortensen, D. Craw, D. MacKenzie, M. Allan, and R. Chapman

Session 20: Iron ore (Tas B)

Chair: Vicky Hough, BHP Billiton

An oxygen and carbon isotope study of fluid flow in the high-grade iron ores (>63 wt % Fe) of the southern Hamersley Province
Warren Thorne and S. Hagemann

The structural evolution and hypogene origin of the Nyidinghu Iron Ore Deposit, Hamersley Province
Doug Kepert, C. Quinn, and C. Fowers

The Fortescue Group basalts: The source of Australia’s iron ore?
Alistair White, R. Smith, M. leGras, and P. Nadoll

Hypogene alteration as a precursor to supergene enrichment—a new style of iron ore mineralization in the Pilbara, Western Australia
Matthew Crowe, L. Bargiev, and D. Tuck

Inversion of the Ashburton Basin margin and structurally controlled hypogene iron ore deposits of the Hamersley Basin
Cam Quinn and D. Kepert

A metallogenic study of high-grade iron ores on North Baffin Island in the “Granulite Facies” domain south of the Central Borden fault zone*
Jonathan Hey, N. Duke, D. Moser, and T. Iannelli

LUNCH 12:30 PM
(Boardwalk Gallery and Wellington Rooms)

SEG Awards Ceremony and Student Presentation Prizes (Auditorium) 1:30 pm

Controversies Session (Auditorium)

Chair: Judith Kinnaird, University of Witwatersrand

• A neptunist’s view in a world of magmatists 2:30 pm
  Ross R. Large

• Gold and plutonism 2:50 pm
  Vic Wall

• Geologic research, science, and the publication process 3:10 pm
  Larry Meinert

BREAK 3:30 PM

Controversies — Panel 4:00 pm

Mark Hannington, Moderator
Panelists: Murray Hitzman, Ross Large, Larry Meinert, James Mungall, Nick Oliver, Vic Wall

CLOSING REMARKS 5:00 PM
**Post-Conference Field Trips**

**Introduction to the Olympic Dam**
Supergiant Iron Oxide Copper Gold Deposit, South Australia
Field Trip Leader: Kathy Ehrig

**Porphyry and Epithermal Systems**
of the Sunda Banda Arc, Indonesia
Field Trip Leaders: David Cooke, Adi Maryono, and Iryanto Rompo

**Active and Extinct Epithermal Environments of the North Island, New Zealand**
Field Trip Leaders: Stuart F. Simmons and Tony Christie

**Post-Conference Short Courses**

**Drill Core Measurements and Domaining for Geometallurgy**
9:00 am October 1
Presenters: Julie Hunt (organizer), Ron Berry, and Michael Roach
Wrest Point, Derwent Room 1

**Faults, Fractures, Fluid Flow and Mineralizing Scenarios – Active and Ancient**
9:00 am October 1–2
Presenter: Rick Sibson
Wrest Point, Derwent Room 2

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**Posters**

Posters will be on display during regular conference hours in the Exhibition Foyer in two sessions: Sunday-Monday and Tuesday-Wednesday. In addition, dedicated exhibits and poster sessions will be chaired by Patrick Sack on Monday and Tuesday, September 28 and 29, at 4:30 pm.

Titles and authors of posters are listed below, grouped by theme. Posters for which the senior author is a student can be identified by an asterisk (*) that follows the poster number.

**Poster Schedule**

**Group 1** (posters 001–147): Sunday-Monday
(set-up, 12:00 pm – 5:00 pm Sunday; take-down, 6:30 pm Monday)

**Group 2** (posters 148–262): Tuesday-Wednesday
(set-up, 8:00 am – 10:00 am Tuesday; take-down, 5:30 pm Wednesday)

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Ores in Subduction-Related Arcs

P 001 Geological Structure Mapping of the Central Gold Belt, Peninsular Malaysia Using PALSAR Satellite Remote Sensing Data
Amin Beiranvand Pour and Mazlan Hashim

P 002* Tumpangpitu Porphyry-High Sulfidation Epithermal Deposit, Tujuh Bukit Project, Indonesia—Geology, Alteration, and Mineralization
Rachel Harrison and Adi Maryono

P 003 Ni-Cu-(PGE) Mineralization in a Continental Back-Arc Setting: The Riwaka Complex, New Zealand
Rose Turnbull, Anthony Christie, William Size, and Andy Tulloch

P 004* Revised Zircon and Sphene Ages from the Central Wasatch, Utah Intrusive Complex: Refining the Magmatic-Hydrothermal History of the Region
Jennifer Thompson, Michael Baker, David R. Cooke, Pete Hollings, Jay Thompson, Lejun Zhang, and Emily Smyk

P 005 The Cerro Quema High-Sulfidation Au-Cu Deposit (Azuero Peninsula, Panama): Geologic Model and Implications for Exploration
Isaac Corral, Mercè Corbella, Albert Griera, David Gómez-Gras, Àngels Canals, and Esteve Cardellach

P 006 Setting and Age of Gold and Copper Deposits in La Zanja Volcanic Field, Northern Peru
Billy Beas, Jocelyn McPhie, and J. Bruce Gemmell

P 007 La Colosa Au-Porphyry Deposit, Colombia: New Insights on the Structural Control and Ore-Forming Processes in the Northern Andes
Andres Naranjo, Johannes Horner, Adriana Castro, Aura Uribe, and Michael Nugus

P 008 Chlorite Trace Element Chemistry as an Exploration Tool: A Case Study from the Collahuasi Mining District, Northern Chile
Michael J. Baker, Jamie J. Wilkinson, Clara Wilkinson, David R. Cooke, and Shawn Inglis

P 009 Characteristics of Sediment-Hosted Epithermal Deposits
David Royle

P 010 Evolving Subduction-Related Basins Control the Formation of VMS Deposits in the Iberian Pyrite Belt
Fernando Tornos, Carmen Conde, Massimo Chiaradia, and Francisco Velasco

P 011 Mineral Diversity in Epithermal Au-Ag Deposits of the Hauraki Goldfield, New Zealand
Anthony Christie

P 012 Mineralization and Alteration of the Ulaan Khud Porphyry: A Possible Extension to the Giant Oyo Tolgoi Cu-Au Deposits
Baigalmaa Lkhagvasuren Melrose

P 013 The Acidity of Hydrothermal Solutions on the Ocean Floor
Chris Ballhaus, Fabian Gäb, and Dieter Garbe-Schönberg

P 014* Tertiary Stratigraphy, Alteration Zones, and Precious Metal Deposits in the Patterson Mining District, Sweetwater Mountains, and Comparison to the Bodie Hills, California
Carli Balogh and Peter Vikre

P 015 Some Thoughts on PGEs Enrichment in Porphyry-Skarn Copper Deposits in the Late Mesozoic Middle-Lower Yangtze River Metallogenic Belt (YRMB), Eastern China
Minfang Wang, Jens Gutzmer, Kun Liu, and Wei Wang

P 016* Infrared Imaging of Geothermal Activity Within the Lienetz Open-Pit, Lihir Au Mine, PNG; Influence of Faults and Porphyry- and Epithermal-Style Breccias on Modern-Day High-Temperature Fluid Flow
Stephanie Sykora, David R. Cooke, David Selley, Chris Allickson, Fiona Koraut, Paul Napier, Bridgette Henderson, and Anthony C. Harris

P 017* Geology, Alteration, and Mineralization of Bayugo Porphyry Copper-Gold Deposit Surigao del Norte, Mindanao, Philippines
Maria Lourdes M. Faustino, David R. Cooke, Nitzie Anne T. dela Cruz, Jamie Ara O. Aviso, Redempta P. Baluda, Noel C. Oliveros, and Claro Jose C. Manipon
P 018* Controls on Mineralization at the FAT (Felsic Ash Tuff) Deposit, Courageous Lake Greenstone Belt, NWT, Canada: Epithermal Gold in Archean Rocks
Marcus Adam, Robert Linnen, William E. Threlkeld, James Freeman

P 019* Sulfur Anomalies and Porphyry Copper Deposits in Their Early Stage of Formation
Vladimir Matjuschkin, Jon Blundy, Richard Brooker, and Brian Tattitch

P 020 Probing Metal Transport in Ore-forming Fluids Using Molecular Simulations
Yuan Mei, Weihua Liu, David M Sherman, and Joël Brugger

P 021* Fingerprinting Gold Mineralization in the Timmins Gold Camp: Synchrotron Trace Element Analysis of Gold and Pyrites from the Dome Mine Ankerite Veins
Jessica M. Stromberg, Erik Barr, Lisa L. VanLoon, Dirk Schumann, and Neil R. Banerjee

P 022* Transition Between Advanced Argillic and Porphyry-Style Alteration at the Far Southeast Porphyry Deposit, Mankanyan District, Philippines
M.F. Calder, Z. Chang, A. Gaibor, G.Tiu, C.J. Pastoral, J.W. Hedenquist, and A. Arribas

P 023* Porphyry and Epithermal Mineralization in the Zijinshan Orefield, Fujian, SE China
Josh Phillips, Jose Piquer, Jing Chen, Lejun Zhang, and David Cooke

P 024* Geology of the Mt Carlton High-Sulfidation (Au-Ag) Epithermal Deposit, NE Queensland, Australia
Fredrik Sahlström, Zhaoshan Chang, Paul Dirks, Isaac Corral, and Mark Stokes

P 025 Setting and Style of VHMS Mineralization in the Eastern Goldfields Superterrane, Western Australia: Insights from the Ag-Zn-(Au) Nimbus Deposit
Steven P. Hollis, Paul Gillespie, David Mole, Andrew Pumphrey, Stephen J. Barnes, Alicia Verbeeten, Christopher J. Yeats, Svetlana Tessalina, and Steven Wyche

P 026 Geology, Alteration, and Mineralization of the Sagay Porphyry Copper Deposit, Negros, Philippines: A New Discovery
Marie April Djoehanne A. Celiz, Romuel R. Landero, Rovi Ann A. Velasquez, Stella Dwayne F. Polino, and Ryota Yoshikawa

P 027* The ~6 Moz Au Archean Rainy River Deposit, Superior Province, Canada: Sub-Seafloor Synvolcanic Au Mineralization
Mireille Pelletier, Patrick Mercier-Langevin, Vicki McNicoll, Justin Tolman, Dean Crick, Marc Richer-Laflèche, Simon Jackson, and Benoît Dubé

P 028 Exhumation and Duration of the Pulang Porphyry Cu-Au Deposit, SW China: Constraints from U/Pb, 40Ar/39Ar, and (U-Th)/He Dating
Cheng-Biao Leng, David R.Cooke, Xing-Chun Zhang, Shou-Xu Wang, and Noreen Evans

P 029* Supergene Enrichment Processes in Porphyry Systems: The Case of the Booubyjan Porphyry Copper(-Gold) Deposit, Southeast Queensland
Jose A. Veracruz, Paul Ashley, Nancy Vickery, and Josh Leigh

P 030* Spectrum of Volcanogenic Massive Sulfide Deposits in the Penokean Volcanic Belt, Great Lakes Region, USA
Patrick Quigley and Thomas Monecke

P 031 The High Sulfidation Epithermal Copper Deposits at Monywa, Central West Myanmar
Yi Sun, Jing Chen, Xiaokang Li, and Win Myint

P 032* Linking Pulsed Porphyry Cu-Mo Formation to Distinct Magmatic Episodes During 30 m.y. of Pluton Emplacement in Southern Armenia, Lesser Caucasus
H. Rezeau, R. Moritz, J-F. Wotzlaw, R. Tayan, S. Hovakimyan, and D. Selby

P 033* Scheelite Vein Mineralization at the Watershed Tungsten Deposit, Northeast Queensland, Australia
Jaime Poblete, Zhaoshan Chang, Yanbo Cheng, Martin Griessmann, Jamie Williamson, and Isaac Corral
P 034  Geology and Mineralization of the Mt Carbine Deposit, Northern QLD, Australia
Yanbo Cheng, Zhaoshan Chang, and Jaime Poblete

P 035*  Hydrothermal Alteration, Mineralization and Breccias at the Zijinshan High Sulfidation Cu-Au Deposit, Fujian Province, China
Jing Chen, David R. Cooke, Lejun Zhang, and Jinping Qi

P 036*  Evidence For Pre- to Syn-Timiskaming Hydrothermal Activity, Abitibi Greenstone Belt, Canada
Gregory Hufford and Thomas Monecke

P 037*  Statistical Data Analysis of the Guadalupe and Don Ese Ag-Au Epithermal Vein Systems to Understand the Geochemical Processes Involved in Orebody Formation
Arturo Ramirez and Philip Goodell

P 038*  Setting of Volcanogenic Massive Sulfides Deposits in the Paleoproterozoic Penokean Volcanic Belt, Lake Superior Region, USA
Ashley Quigley, Thomas Monecke, Patrick Quigley, and Eric Anderson

P 039  Timing of Ore Mineralization at the Golpu and Nambonga North Porphyry Copper-Gold Deposits, Papua New Guinea: Insights from Re-Os Ages
Moira Lunge Bawasu and Joseph O. Espi

P 040  The Karangahake Epithermal Au-Ag Deposit Hauraki Goldfield, New Zealand: A Telescoped Vein System?
Mark P. Simpson and Anthony B. Christie

P 041*  Structural Geology and Timing of Deformation at the Gibraltar Cu-Mo Porphyry Deposit: Controls on Mineralization, Cariboo Region, British Columbia
Nader Mostaghimi, Lori Kennedy, and Janet Gabites

P 042*  Magmatic-Hydrothermal Origin of the Labuzaika Gold Deposit, Western Qinling Orogen, China
Ji-xiang Sui, Jian-Wei Li, and Jia Chang

P 043  Copper Isotope Systematics of Chalcopyrites in Ancient and Modern Seafloor Hydrothermal Deposits, Measured by a Femtosecond LA-MC-ICP-MS
Kei Ikehata, Junichiro Ishibashi, and Takafumi Hirata

P 044*  The Relationship Between Volcanic-Hydrothermal Breccias and Gold Mineralization at the Lihir Alkalic Gold Deposit, Papua New Guinea
Erin Lawlis, David R. Cooke, and Anthony C. Harris

P 045*  The Geochemical and Geochronological Framework of the Monywa High Sulfidation Cu and Low Sulfidation Au-Epithermal Deposits, Myanmar
Joseph Knight and Khin Zaw

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P 049  Spatial Distribution Patterns in Lead Isotopes from the Lachlan and Delamerian Orogens: Implications for Tectonics, Metallogenesis, and Mineral Exploration in Southeast Australia
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**P 055**  Geophysical Characteristics of the Gosowong Goldfield, Indonesia
Michael Dunne and Michael Roach

**P 056**  An Imature Back-Arc Setting for the Teutonic Bore Volcanic Complex Stratigraphy, Host to the Neoarchean Jaguar VHMS Deposit
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**P 060**  Multi-element Geochemistry and Hydrothermal Alteration at the Pajingo Low Sulfidation Epithermal Gold Deposit
Ned Howard, Scott Halley, Jenny Pinder, Chris Chambers and Roric Smith

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**P 062**  Experimental Constraints on Hypogene Alteration: Acidic Gases and Magmatic Brines
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**P 063**  Characteristics and Age Spatial Distribution of Gold Deposits in Western Java and Their Exploration Implications

**P 064**  Mineralization Styles and Metallogenic Epochs of Sumatra
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A. Lee Barker

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Raymond M. Coveney, Jr.

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P 085* A Shallow Metamorphic Source for Tungsten (Scheelite) in the Turbidite-Hosted Orogenic Gold Deposits of the Otago Schist, New Zealand
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P 089 The Paleoproterozoic Ni-Zn-Cu-Co-(Mo-V-U) – Enriched Talvivaara Formation, Finland: GOE-Related Coastal Acid Sulfate Soil Drainage and Tidal Resedimentation of Estuarine Metalliferous Monosulfidic Black Muds—A New Ore Forming Process?
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P 090 Controls of Sulfide Mineralization at the Kamoa Copper Deposit, with an Emphasis on Structural Controls, SE Democratic Republic of Congo
Franck Twite, David Broughton, Paul Nex, Judith Kinnaird, and David Edwards

P 091* Trace Elements in Sedimentary Pyrite and Gold Content from Selected Black Shale Formations in Malaysia: Evidence of Diagenetic Gold Enrichment in the Ocean
Charles Makoundi, Ross R. Large, Khin Zaw, Mohd Shafeea Leman, and Kamal Roslan

P 092 Sulfur Isotope Implications for the Genesis of Orogenic Gold Deposits in Southeastern Guizhou Province, China
Liu Anlu, Zhang Jun, and Chen Yi

P 093* Utilizing High-Resolution Aeromagnetic Datasets for Sequence Stratigraphic Analysis of the Kalahari Copperbelt, Botswana and Namibia, and Implications for Sedimentary Rock-Hosted Cu-Ag Mineralization
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Catherine Knight, John Deane, David J. Catterall, and M. Stephen Enders

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P 097* Paragenesis, Re-Os Systematics, and in situ Sulfur Isotopic Composition of the Anarraaq Zn-Pb-Ag-Ba Deposit, Red Dog District, Northwestern Alaska, USA
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Evgeniy Bastrakov, Roger Skirrow, and David Huston

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Azam Soltani Dehnavi, David R. Lentz, and Christopher R.M. McFarlane

P 110  Characterization of the Diagenesis, Alteration, and Cu Mineralization in the Cretaceous Sedimentary Rocks of the Tordillos Deposit, Neuquén Basin, Argentina  
Maria Joseﬁna Pons, Marta Franchini, Lawrence Meinert, Adolfo Giusiano, Agnes Impiccini, Daniel Beaufort, Patricia Patrier, and Ana Laura Rainoldi

P 111*  Carbon and Oxygen Isotopes in Sediment-Hosted Stratiform Copper Deposit, in Nahand- Ivand Area, NW Iran  
Seyedeh Narges Sadati, Mohammad Yazdi, and Jingwen Mao

P 112  Deformation, Metamorphism and Hydrothermal-Metasomatic Alteration of the Neoproterozoic BIF-type Fe-Co-Cu Ore District in Hainan Province, South China: Implications for Mineralization  
Deru Xu, Zhilin Wang, Huayong Chen, Peter Hollings, and Nonna Bakun-Czubarow

P 113  The Nature and Origin of the Brucejack High-Grade Epithermal Gold Deposit, British Columbia, Canada  
Duncan F. McLeish, Anthony E. Williams-Jones, and Warwick S. Board

P 114*  Gold Remobilization in the Giant Obuasi Deposit  
Denis Fougerouse and Steven Micklethwaite

P 115  Multi-Stage Enrichment Processes for Large Gold-Bearing Ore Deposits  
Sebastien Meffre, Ross R Large, Jeffrey A. Steadman, Daniel D. Gregory, Aleksandr Stepanov, Vadim Kamenetsky, Kathy Ehrig, and Robert J. Scott

Magmatic Deposits

P 116  The Impact of Early Sulfur Saturation and Calc-Crustal Contamination on Ore-Forming Processes Within the Posan Mafic-Ultramafic Complex: Derivation from the Shallow Depleted Mantle, Beishan Region, NW China  
Jian Ma, Xibiao Lu, Yanrong Liu, Yuegao Liu, and Banxiao Ruan

P 117  Compositional Variations of Chromite from the Hongshishan Ni-Cu–Bearing Mafic-Ultramafic Complex, NW China: Petrogenetic and Metallogenic Implications  
Banxiao Ruan, Yingmin Yu, Xibiao Lu, Wei Wei, and Chunming Wu

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**BOARDWALK GALLERY**

**Wellington Rooms**
SEG 2015 Conference Floor Plan

Riverview level (1st floor)
- Riverview level (1st floor)
- Conference Registration Desk
- The Coffee Shop
- Boardwalk Snacks
- Auditorium
- Tasman Rooms A, B, C
- Exhibition Foyer
- Speaker Ready Room

Boardwalk level (ground floor)
- Boardwalk Gallery
- Pier One Private Dining Room
- Pier One Restaurant & Bar
- Boardwalk Snacks
- Wellington Rooms
- Exhibition Foyers
- Exhibits
- Tower
- Pool

“Wrest Point Hotel Casino” by Damien Ramon Naidoo - Own work. Licensed under CC BY-SA 3.0 via Commons - https://commons.wikimedia.org/wiki/File:Wrest_Point_Hotel_Casino.jpg#/media/File:Wrest_Point_Hotel_Casino.jpg
CALL FOR ABSTRACTS
Abstract deadline: March 31, 2016

THEMES
- Western Tethyan metallogeny
- Tectonics of Tethyan oceans and ophiolites
- Central Tethyan metallogeny
- Tectonics of Cretaceous and Tertiary Tethyan arcs
- Eastern Tethyan metallogeny
- Collisional tectonics in the Tethyan orogen
- Cradle of mining: Exploration and development to the present
- Tethyan sedimentary basins and supergene environments

WORKSHOPS
- Epithermal deposits
- Porphyry deposits
- Structure
- Physical volcanology
- Exploration geochemistry
- Mineral economics
- Exploration geophysics

FIELD TRIPS
- Borate deposits of western Turkey
- Biga Peninsula: Au-Cu-Mo-Pb-Zn deposits
- Tour of western Turkey with a mix of porphyry-epithermal deposits
- Central Anatolian magmatism and Au deposits
- VMS deposits of Pontides
- Eastern Turkey: Mix of porphyry-epithermal and skarn deposits
- Balkans I: Tour of Greece and Bulgaria with a mix of porphyry-epithermal deposits and recent discoveries
- Balkans II: Tour of Bor Complex