Orogenic gold deposits: deposit models to exploration methodology

Two-day short course, Saturday and Sunday, 16-17 November

Presenters

David Groves, Emeritus, University of Western Australia: di_groves@hotmail.com
Dave Craw University of Otago: dave.craw@otago.ac.nz

Short course description

Orogenic gold deposits, or gold deposits in metamorphic rocks, are the spatially and temporally most widespread gold deposit type, defining important exploration targets in Precambrian shields and in Phanerozoic orogenic belts. Detailed material for this globally important deposit type will be provided on tectonic and structural controls, geological characteristics, geochemical and geophysical signatures, geochronological relationships, and exploration strategies. Examples of world class deposits and districts will be presented from throughout the world, as well as from South Island, New Zealand. Comparisons and contrasts with other major gold deposit types, including the Carlin-type and intrusion-related gold system ores, will be described. The course is aimed for geoscientists from both industry and academia, as well as students of economic geology, who desire a comprehensive understanding of modern concepts on the geology of gold deposits.

Short course schedule

Saturday 16 November:

8:30-9:00 am  Introduction to gold deposit models (Goldfarb)
9:00-10:00 am  Characteristics of orogenic gold I (Goldfarb)
10:00-10:30 am  Tea/Coffee break
10:30-12:00 pm Characteristics of orogenic gold II (Goldfarb)
12:00-1:00 pm Lunch
1:00-2:30 pm Precambrian orogenic gold (Groves)
2:30-2:45 pm Tea/Coffee break
2:45-3:45 pm Cenozoic-Mesozoic orogenic gold (Goldfarb)
3:45-4:00 pm Refreshment break
4:00-5:00 pm Paleozoic orogenic gold (Goldfarb)

Sunday 17 November:
8:00-10:00 am Orogenic gold in New Zealand (Craw)
10:00-10:30 am Tea/Coffee break
10:30-12:00 pm Exploration for orogenic gold (Groves)
12:00-1:00 pm Lunch
1:00-1:30 pm Introduction to controversial gold deposits (Goldfarb)
1:30-3:00 pm Comparisons/contrasts of orogenic gold with Carlin-type, intrusion-related gold systems, and IOCG deposits: lithospheric and magmatic considerations (Groves)
3:00-3:30 pm Tea/Coffee break
3:30-4:00 pm Comparisons/contrasts of orogenic gold with the Witwatersrand deposits (Groves)
4:00-4:30 pm Secular distribution of orogenic gold (Goldfarb)

Richard J. Goldfarb
Rich is a senior research geologist with the Minerals Program of the U.S. Geological Survey, where he has been employed for more than 32 years. His major expertise is in the area of the geochemistry and geology of ore deposits, with emphasis on Phanerozoic orogenic gold. Much of his earlier career work was concentrated on the Tertiary orogenic gold deposits of southern Alaska. Results from this work were used to develop ore genesis models for giant gold deposits elsewhere in Alaska and in other parts of the North American Cordillera. In recent years, Rich has conducted detailed studies on the understanding of the distribution of orogenic gold deposits through space and time, compiling the most comprehensive global description of their distribution and evaluating the controlling tectonic/geologic features. He has senior-authored and co-authored more than 195 refereed publications in economic geology.

David I Groves
David received a BSc Honours (1st class) and PhD from the University of Tasmania. He joined the University of Western Australia (UWA) in 1972 as Lecturer, and became full Professor and Founder and Director of the Key Centre for Strategic Mineral Deposits (later Centre for Global Metallogeny) in 1987. Throughout his career, he has supervised over 250 graduates for BSc Honours, MSc or PhD degrees and authored or co-authored around 500 publications in economic geology. He has been President of the Geological Society of Australia, SEG and SGA, and has been awarded 11 medals for his research, including both the Gold Medals of SEG and SGA for lifetime contributions to economic
geology, and the Geological Association of Canada Medal. Before retirement from UWA as Emeritus Professor, he organised the foundation of the now-successful Centre for Exploration Targeting at UWA. Since retirement, he has been awarded an honorary DSc from UWA and consulted to the exploration industry and investment groups on all continents, mainly for Canadian companies in Africa and Brazil. He has also presented workshops on geological aspects of the business of exploration in Canada and the UK to brokers and investors.

Dave Craw
Dave is a Professor in the Geology Department, University of Otago. He lectures and researches in the fields of applied geology and environmental geology. Dave has 32 years research experience in the Otago Schist and related rocks, with emphasis on relationships between structure, metamorphism, and gold mineralization.

Minimum number of participants: 15

Cost: $400. Cost includes morning and afternoon coffee/tea and lunches on both days.

Further information: Email Rich Goldfarb at goldfarb@usgs.gov

GALLERY
Typical laminated vein texture, Wakamarina, New Zealand.

Mineralised schist, Frasers pit, Macraes mine (>7 Moz), East Otago, New Zealand
Complex polyphase quartz-scheelite-gold vein (30 cm thick), Frasers Underground, Macraes mine, East Otago, New Zealand
Fluid flow models and gold
Tectonic controls on global gold resources

Grade-Tonnage for Orogenic Au Deposits (>70t)
Carbonic fluid inclusions

Hydrogeological model of the crust
Gondwana to Pangea Gold