

Program, Critical minerals: From discovery to supply chain

This online workshop, being held November 16-18, 2021, will address the critical minerals needed to grow low-carbon economies, emphasizing those used in battery, magnet, and photovoltaic technologies. Presentations will consider the life cycle of critical minerals from exploration, resource availability, and mineral systems to market trends and supply chains.



Australian Government
Geoscience Australia



Program and speaker list

Tuesday, November 16
13:30 PST (21:30 GMT)

Acknowledgement of traditional lands and opening remarks

Adrian S. Hickin, Chief Geologist and Executive Director, British Columbia Geological Survey
The Honourable Bruce Ralston, M.L.A., Minister of Energy, Mines and Low Carbon Innovation

Session 1: Critical minerals and markets

Chair: Neil Wildgust, British Columbia Geological Survey

Nedal T. Nassar (keynote), United States Geological Survey
Characterizing and prioritizing critical mineral supply chain risks and potential abatement strategies

Andrew Miller, Benchmark Mineral Intelligence Ltd.
Building a supply chain for the lithium ion economy

Andrew Heap, Geoscience Australia
Critical Minerals Mapping Initiative: Geoscience for discovery

George J. Simandl, British Columbia Geological Survey
Critical, specialty, magnet, battery, and photovoltaic materials: Key factors for responsible exploitation and development decision making

Question and answer period

16:30 PST (0:30 GMT)

Session 2: Geology of critical minerals

Chair: Jan M. Peter, Geological Survey of Canada

Stephen E. Kesler, Department of Earth and Environmental Sciences, University of Michigan
Lithium deposits: From magmas to playas

Murray W. Hitzman, Irish Centre for Research in Applied Geosciences, University College Dublin
Geology of cobalt

Sarah-Jane Barnes, Sciences de la Terre, Université du Québec à Chicoutimi
Critical metals found in magmatic ore deposits; Ni, Cu, Co, PGE, Te, Se, Bi, and V

Anthony E. Williams-Jones, Department of Earth and Planetary Sciences, McGill University
The rare earth elements: A tale of mantle plumes, magmas, and fluids

Andrew Conly, Department of Geology, Lakehead University
The diverse nature of graphite deposits: An overview of their geological characteristics and economic considerations

Robert R. Seal II, United States Geological Survey
Mine waste as a potential source of critical minerals: The importance of understanding speciation and identifying synergies between resource recovery and environmental management

Max Frenzel, Helmholtz Institute Freiberg for Resource Technology
Geochemistry and economic geology of Ga, Ge and In: An overview

Question and answer period

Wednesday,
November 17
13:30 PST (21:30 GMT)

Session 3: World-class critical mineral deposits

Chair: Zhehan Weng, Geoscience Australia

Hong-Rui Fan, Chinese Academy of Sciences
The giant Bayan Obo REE-Nb-Fe deposit (China): Ore genesis and resource potential

M. Christopher Jenkins, Department of Earth Sciences, Carleton University
The nature and composition of the J-M Reef, Stillwater Complex, Montana, USA

Philippe Muchez, KU Leuven, Department of Earth and Environmental Sciences
Cu-Co ore deposits in the Central African Copperbelt: Origin and transport of metals, ore mineral precipitation, and regional and stratigraphic distribution

Philip L. Verplanck, United States Geological Survey
An overview of the world-class Mount Weld rare earth element deposit

Kathryn Goodenough, British Geological Survey
African lithium pegmatites

Question and answer period

16:30 PST (0:30 GMT)

Session 4: Selected critical mineral deposits I

Chair: Evan Orovan, British Columbia Geological Survey and Centre of Ore Deposit and Earth Sciences, University of Tasmania

Marcus Haynes, Geoscience Australia
The potential for critical minerals: Australia's contribution to the global supply chain

Helen Degeling, Geological Survey of Queensland
Strategic resources and the new economy: Queensland's critical mineral potential

Vladimir Lisitsin, Geological Survey of Queensland
Critical minerals in traditional deposit types in the Mount Isa region, Queensland, Australia

Carl Spandler, Department of Earth Sciences, University of Adelaide
Unconformity-related REE deposits of the Browns Range, Australia

Evan Orovan, British Columbia Geological Survey and Centre of Ore Deposit and Earth Sciences, University of Tasmania
The Trial Harbour Ni skarn, Zeehan mineral field, western Tasmania

Michael G. Gadd, Geological Survey of Canada
Critical minerals in Paleozoic hyper-enriched black shales

Question and answer period



Thursday, November
18
13:30 PST (21:30 GMT)

Session 5: Selected critical mineral deposits II

Chair: Allen Andersen, United States Geological Survey

Mark W. Bultman, United States Geological Survey
Potential for concealed critical mineral deposits in the northern Trans-Pecos region of West Texas and southern New Mexico from a new aeromagnetic survey

Kathryn E. Watts, United States Geological Survey
Temporal and petrogenetic links between Mesoproterozoic alkaline and carbonatite magmas at Mountain Pass, California

Frank Santaguida, First Cobalt Corp.
New cobalt-copper resources: New perspectives from the Iron Creek project, Idaho cobalt belt

Craig Bow, Group Ten Metals Inc.
Precious and base metal mineralization within the Peridotite zone of the Stillwater Complex, Montana, USA

Thomas R. Benson, Lithium Americas Corp.
Geology of the Thacker Pass deposit in the McDermitt Caldera, Nevada: The largest and highest grade known sedimentary lithium resource in the United States

Fiorella Sist, Controlled Thermal Resources (US) Inc.
Development of a mineralized brine resource: The Hell's Kitchen lithium and power project, Salton Sea, USA

Question and answer period

16:30 PST (0:30 GMT)

Session 6: Exploration methods and technical considerations

Chair: George Simandl, British Columbia Geological Survey

M. Beth McClenaghan, Geological Survey of Canada
Application of indicator mineral methods to critical material exploration

René Booysen, Helmholtz Institute Freiberg for Resource Technology
Multi-scale and multi-source remote sensing of REEs in southern Africa

Mike D. Thomas, Geological Survey of Canada
Use of geophysical methods in exploration for critical materials

Sandra Lorenz, Helmholtz Institute Freiberg for Resource Technology
Outcrop sensing for the exploration of REEs and lithium

Tassos Grammatikopoulos, SGS Canada Inc.
Integration of process mineralogy in critical element deposits

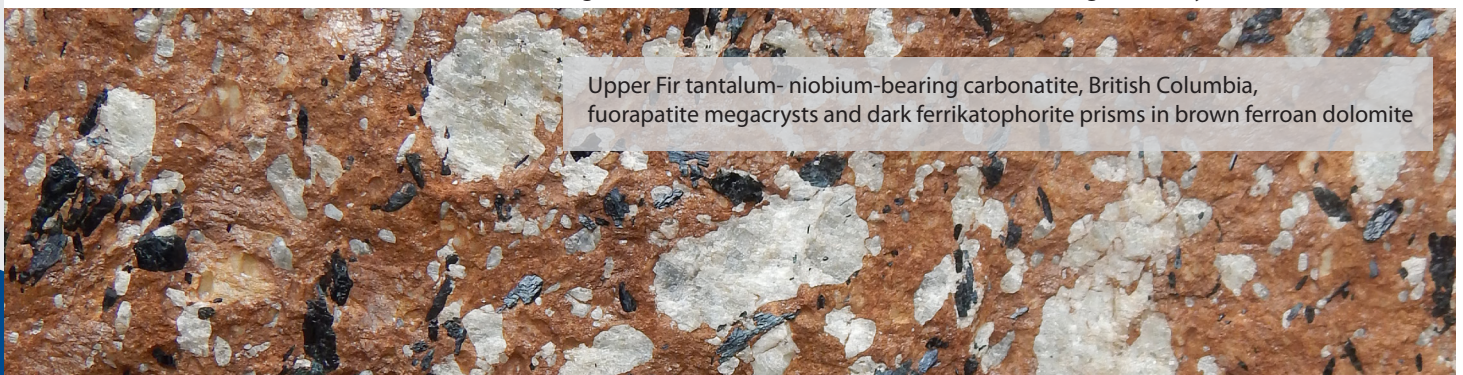
John R. Goode, J.R. Goode and Associates
Rare earth elements: Challenges facing present and potential producers

Moritz Kirsch, Helmholtz Institute Freiberg for Resource Technology
Multi-source hyperspectral imaging of drill cores for the exploration of critical minerals

Question and answer period

Closing remarks

Adrian S. Hickin, Chief Geologist and Executive Director, British Columbia Geological Survey



Upper Fir tantalum- niobium-bearing carbonatite, British Columbia, fluorapatite megacrysts and dark ferriaktophorite prisms in brown ferroan dolomite