

College of the North Atlantic

Location: PDAC Conference Room 202 B – North Building

Date: March 6, 2023

Time: 9:00 AM to 5:00 PM

Morning Session

Reality Capture Technologies in Mining

9:00 AM to 9:15 AM

Welcoming Remarks and Introduction to College of the North Atlantic

Speakers: *Dr. Michael Long, Dean of Applied Research and Innovation, and Dr. Gary Thompson, Director of Industry Innovation, College of the North Atlantic*

9:15 AM to 9:30 AM

The Mining Innovation Commercialization Accelerator (MICA) Network and Technology Innovation for Canada's Mining Industry

Speaker: *Doug Morrison, President & CEO, Centre for Excellence in Mining Innovation (CEMI)*

This session will discuss how MICA is advancing fit-for-purpose technology adoption across the mining sector and MICA funding to support those initiatives.

9:30 AM to 10:00 AM

Applications of Reality Capture in Mining

Speaker: *Blair Bridger, (P. Eng.) Geomatics Engineering Technology Faculty, College of the North Atlantic*

This session will provide a general introduction to reality capture in the mining sector, an overview of how reality capture is used for applied research at the College of the North Atlantic, and how that research is impacting the local mining sector.

10:00 AM to 10:30 AM

Use of Reality Capture for Underground Mapping

Speaker: *Charlie Dalton, Geomatics Engineering Technologist, College of the North Atlantic*

This session details projects aiding underground mine operations, through applications ranging from safely mapping drifts with autonomous UAVs to identifying mineralization from LiDAR intensity returns, and more!

10:30 AM to 10:45 AM

Break

10:45 AM to 11:15 AM

Can you dig it? Migrating Digital Twin Innovations from Offshore Oil & Gas to Mining

Speaker: *Desmond Greene, GRi Simulations Inc.*

For decades, GRi Simulations Inc. have been leaders in digital twinning and net zero emission simulation approaches to offshore training and innovation.

Focusing on risk reduction, and enabling engineering efficiency in the design and testing of advanced autonomy and artificial intelligence in offshore systems and operations, GRI is currently investigating the migration of these proven methodologies to mining operations.

11:15 AM to 11:45 AM

Reality Capture & Lease Line Monitoring

Speaker: *Stephen Rowe, Senior Technology Manager and Senior Project Manager, SEM Ltd.*

Data fusion goes hand-in-hand with environmental compliance and modern technology. In this talk, SEM Ltd. details their advancements in year-round reality capture for Tailings Deposition Planning and Lease Line monitoring.

11:45 AM to 1:00 PM

Networking and Break for Lunch

Afternoon Session

Hyperspectral Imaging

1:00 PM to 1:05 PM

Welcome

Speaker: *Honourable Andrew Parsons, Minister of Industry, Energy and Technology, Government of Newfoundland and Labrador*

1:05 PM to 1:25 PM

Technology integration into the Province of Newfoundland and Labrador – Industry, Energy, and Technology

Speaker: *Glen Penney, Project Leader - Core Storage Program - Mineral Development Branch – Newfoundland and Labrador Department of Industry, Energy and Technology*

College of the North Atlantic and the Newfoundland and Labrador provincial government's Hyperspectral Scanning Unit project aims to digitize 200,000 meters of drill core stored across the province in six libraries. This talk will highlight the value of hyperspectral digitization within the NL Mining and Mineral Development Branch.

1:25 PM to 1:45 PM

Introduction to Hyperspectral Imaging

Speaker: *Dr. Philip Lypaczewski, Lead Faculty Researcher - Hyperspectral Group, College of the North Atlantic*

An overview of hyperspectral scanning technology, and an introduction to common mineralogy seen in typical drill core will be presented, and the ongoing public geoscience initiative at College of the North Atlantic will be introduced. This initiative has as its goal acquiring hyperspectral imaging data on up to 200,000 meters of drill core stored in Newfoundland and Labrador's Department of Industry, Energy and Technology public Core Storage Libraries and will serve as a public database of hyperspectral data that will be available to exploration companies and geoscience researchers.

1:45 PM to 2:05 PM

Atlas of mineralogy alteration associated with Newfoundland and Labrador gold occurrences from hyperspectral analysis of drill core

Speaker: *Halina Kondrasovas, (M.Sc.) Faculty Researcher – Hyperspectral Group, College of the North Atlantic*

The Newfoundland Appalachians hosts a variety of gold deposits from epithermal to orogenic. In this context, hyperspectral imaging in the VIS-NIR, SWIR, MWIR and LWIR ranges was used on drill core from different deposits in the province with the intent of recognizing alteration vectors and generating an atlas of gold alteration.

2:05 PM to 2:25 PM

Hyperspectral Analysis for identification of footwall alteration haloes and gossanous bedrock in Newfoundland and Labrador

Speaker: *Dr. Derek Wilton, Faculty Researcher, Hyperspectral Group, College of the North Atlantic*

This talk will review the use of hyperspectral analysis for identification of footwall alteration haloes and regional fault traces in drill core from the Buchans VMS deposit and the mineralogy of gossanous bedrock material from the Canadian Arctic and Voisey's Bay, NL.

2:25 PM to 2:45 PM

Break

2:45 PM to 3:05 PM

Autonomous mineral data logging using a broadband hyperspectral imaging drill core scanner

Speaker: *Marie-Christine Ferland – Business Development Coordinator, Photon Etc.*

This session details on-site mineralogical characterization using broadband hyperspectral imagery. Photon etc.'s nCore modular drill core scanner allows for autonomous data logging of vast quantities of cores quickly. The collected data contains detailed hyperspectral images used to perform lithologic assessments.

3:05 PM to 3:25 PM

Applications of hyperspectral data in sustainability tracking

Speaker: *Rob McEwan - Co-founder and CPO, Korral*

Sustainable mining practices have the potential to improve operational efficiencies and are fundamental to achieving many of the 2030 Sustainable Development Goals. Expanding frameworks that help guide sustainability tracking and reporting constitute a critical step towards reaching these goals. However, there is a lack of detail on how modern sensors collect data in support of efficient tracking and reporting. Hyperspectral data enables the quantification of a diverse set of sustainability metrics across the mining value

chain and can be deployed as a cost-effective tool for sustainability tracking and reporting.

3:25 PM to 3:45 PM

Multi-scale hyperspectral imaging for geology and mining

Speaker: Trond Løke, CEO at Norsk Elektro Optikk AS

This presentation will cover practical aspects of hyperspectral UAV data acquisition and processing, along with examining recent trends in hardware and software development for hyperspectral imaging in geological applications.

3:45 PM to 4:05 PM

The role of machine learning in exploration and mining: Turning real-time data acquisition into actionable information

Speaker: McLean Trott, Senior Geodatascientist / Embedded Researcher at GoldSpot Discoveries Corp.

Exploration vectoring and enhancing ore body knowledge can be improved by the rapid incorporation of real time geologic data. Inconsistent geological logging, especially on projects that are long-lived or historic, is commonplace in the mineral exploration and mining industry. Advancements in portable data acquisition hardware are providing real-time data on active drilling projects, but there are still gaps in the workflow between acquisition of real time data and utilizing it effectively to inform active drilling decisions. We can improve our exploration models and increase ore body knowledge through the use of machine learning processes to utilize real-time data, while still underpinning our interpretation with human geological insight.

4:05 PM to 4:25 PM

Bringing it all together: Planned projects and industry partnership opportunities using the college's reality capture and hyperspectral technologies

Speaker: Dr. Michael Long, Dean of Applied Research and Innovation, College of the North Atlantic (CNA)

4:25 PM to 5:00 PM

Networking