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A research arm of:

**Laurentian University**  
Canada's Mining University

Mining Innovation, Rehabilitation and Applied Research Corporation  **Sudbury, ON Canada**

# SPRING 2021 NEWSLETTER

## Who We Are

We are the innovative research partner of choice for mining and related industries since 1998. MIRARCO's talented team of academic and industry professionals offer their expertise to solve mining industry challenges through applied research.

As a not-for-profit research arm of Laurentian University, we provide our industry partners with access to knowledge, funding, students, support and assistance for new projects.

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 **News Stories & Announcements**



## **Dr. Nadia Mykytczuk appointed leader at MIRARCO**

MIRARCO Mining Innovation is pleased to announce the appointment of Dr. Nadia Mykytczuk as the Interim President and CEO of MIRARCO effective May 25, 2021. In this capacity, Dr. Mykytczuk will provide support to the Goodman School of Mines at Laurentian University.

An environmental microbiologist, Dr. Mykytczuk's work focuses on bioleaching and mine remediation. From 2016 to 2021, she held the role of Industrial Research Chair in Biomining, Bioremediation, and Science Communication. She is regarded as one of Canada's top experts in biomining and bioremediation. Dr. Mykytczuk will continue to advance her research in biomining and bioremediation while supporting and growing the applied research expertise and projects at MIRARCO in her new role.

Read more about this story, [here](#).

## **New Engineering Research Project Receives Support by Federal Agency**

MIRARCO Mining Innovation has received funding for a research project aimed at incorporating realistic discrete fracture networks (DFNs) to investigate the excavation response of mining engineering structures so as to reduce rock engineering risk and improve mining safety and productivity. The project is funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) through its Alliance program.

The project is supported by project partners **Nuclear Waste Management Organization (NWMO)** and **IAMGOLD Corporation** who are providing financial and in-kind support.

Read more about this story, [here](#).



## MIRARCO Appoints New Lab/Field Manager

MIRARCO is pleased to announce the appointment of **Dr. Alex Hutchison** as the Lab/Field Manager. Dr. Hutchison is an experimental research engineer with a Ph.D. in Mining Engineering and Mineral Processing from Laurentian University.

His current role at MIRARCO is to support the Geomechanics Research Center and Software Team and to lead fieldwork and testwork programs and deliver on experimental targets.

Read more about this story, [here](#).

## New Research Opportunity to Mitigate Risk for Snow Melt Management for Tailings Ponds in Mining Operations Receives Support from the Government of Ontario

MIRARCO Mining Innovation is pleased to announce the awarding of funding from the Government of Ontario's Voucher for Innovation and Productivity (VIP) program, led by the Ontario Centre of Innovation (OCI), and Glencore Sudbury to execute the Snow Melt Management for Tailings Ponds in Mining Operations Project.

This 18-month joint project between **Glencore Sudbury**, MIRARCO and **Cornerstone** is expected to result in the development of new tools, equipment and methodologies to significantly reduce peak water flow rates at tailings management facilities during the spring runoff period.

Read more about this story, [here](#).



## Mineral Resources Industry Leadership Certificate

The Goodman School of Mines is launching a new Mineral Resources Industry Leadership Certificate program with classes expected to start this September.

The program is offered to both Laurentian University students and young professionals, who currently work or have experience working in the Mineral Resources industry. Applications are now open! The deadline for registrations is **July 16, 2021**.

On March 30th, we also offered an information session to interested participants that provided more details about this upcoming program. You can view a recording of the session, [here](#).

To learn more about this program and register, please click [here](#).



## Upcoming Online Training at Canada's Mining University.

## Project Management Training

[Project Procurement & Contract Management | August 24 & 25, 2021](#)

[Managing Project Risk | September 13 & 14, 2021](#)

[Project Management Essentials | October 25, 26, 27 & November 1, 2, 3, 2021](#)

[Project Communications & Stakeholder Management | November 8 & 9, 2021](#)

[Project Closeout Best Practices | November 15 & 16, 2021](#)

[PMP Exam Preparation | 2021 - Online Sessions \(See Course Page\)](#)

For the complete course lineup, please [click here](#).



## **Deformation-Based Support Design for Burstprone Mines (Module 1)**

This September, the Goodman School of Mines and MIRARCO will be offering a new short course about the functionality of the rock support in deforming ground.

It presents an overview of guiding principles, the motivation for change, and the potential benefits for mining operations. It focuses on opportunities to overcome deficiencies in current practices and opportunities for safe and cost-effective rock support strategies. Key aspects for change management when moving toward deformation-based support design and when adopting preventive support maintenance procedures are introduced.

The course consists of three hours of presentations with active interactions presented in a virtual delivery format. As much as possible, the course material will be tailored to the needs of the participants or hosting company and the common support technologies adopted at the operations of the attendees.

## What We Do



### Our Research Centres

Our team of experts divide their focus in four distinguished areas:

**Geomechanics, Software, Safety, and Energy.**

### Energy

The Energy Centre provides research and analysis to help the mining industry adopt sustainable, carbon-free energy solutions.

The centre is led by Dr. François Caron, who joined MIRARCO in January 2019 as the Bruce Power Chair in Sustainable Energy Solutions. He is also Emeritus Professor at Laurentian University. He has more than 30 years of working experience in the nuclear industry and in academia, working mostly on nuclear waste management, reactor emissions reduction and environmental radioactivity.



Energy is focusing on the acceptability of small modular reactors (SMRs) for mining. Dr. Caron believes acceptability will need to address:

- Environmental and wastes issues;
- Cost-competitiveness of SMRs and low carbon footprint;
- Proper, unbiased environmental communication of SMR for mining and Communities.



## **SMR CONCEPT**

Watch the video to learn more about SMRs.

### **Environmental**

Trace analysis of airborne pollutants in Lichens. This research investigates lichens as a forensic tool for past airborne of radioactive and metal contaminants. Lichens grow under a variety of climates; their nutrient needs are supplied almost exclusively airborne. They grow slowly, and they can accumulate pollutants for several years, making it possible for forensic analysis of past airborne pollution. Lichens as a biomonitor have limitations: we are investigating the time frame, the biogeochemical mechanisms involved and the types of elements can be used for this purpose.

For an example of application for airborne lead, please click [here](#).

### **Cost-competitiveness of SMRs**

MIRARCO has performed two case studies with two mining companies on the conceptual economic analyses of small modular reactors (SMRs) in off-grid areas for mining. Mining companies are looking at alternatives to diesel generators to decrease their operational costs and their carbon footprint. SMRs are potential alternatives. This research involves getting engineering data from mining operations and projecting costs under different scenarios.

A preliminary paper presented at the Conference of Metallurgists (COM) 2020 can be found [here](#).

### **Environmental Communication**

We believe that we can make a strong contribution to SMR acceptability by addressing key issues raised by the Public in general, (i.e., costs and competitiveness, carbon footprint, environmental issues and perceived risks). This can be achieved by invoking proper communication and social acceptance of SMRs as an energy source. This can be achieved by reviewing the use and alternative energy options for mining and remote Communities, identify perceptions, gaps, and risks in adopting these changes, engage and identify change champions with key Rightsholders and stakeholders, and Industry. We also believe the right communication tools need to be developed so that Communities and mining companies alike make informed decisions based on their experience,

For more information about this topic, please click [here](#) & [here](#).

## Updates

### **Small reactors could power far north mines: Study shows vSMRs could reduce emissions by 85 per cent or more**

A new case study by MIRARCO, Mining Innovation, the **Ontario Power Generation (OPG)** and the **Canadian Nuclear Laboratories (CNL)**, has concluded that very small modular reactors (**vSMRs**) could provide clean and reliable energy to remote northern mines and surrounding communities. This could not only reduce costs but also eliminate reliance on diesel.

Other advantages to SMRs include:

- Their small size, making them easier to transport and install in remote communities;
- Their ability to safely, reliably produce power;
- Long operating life without the need for an onsite inventory of fuel;
- Short installation period due to their modular construction and factory fabrication.

To learn more about this report, please click [here](#).

A short presentation about the recently completed conceptual study by CNL, OPG and MIRARCO was showcased at a pre-PDAC event, the “Small Modular Reactors and the Path to Net Zero Mining” webinar organized by CNL on March 5th, 2021. This presentation, in the style of a panel discussion, gave an overview of the cost competitiveness of SMRs at a mine site. It was also presented at the “Mining & Micro-Reactors: A New Off-Grid Horizon” webinar by Reuters on March 31st, 2021. You can find the presentation, [here](#).

## Where You Can Find Us

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