

# 4

## Institutional Chair in Development of New Communication and Automation Technologies for Smart Mines

VALLÉE-DE-L'OR

Investment:  
**\$500,000**

FUQAT contribution:  
**\$500,000**

### THE PROJECT

#### **Telebec Underground Communications Research Laboratory (LRTCS)**

On the strength of its 20 years of operation, the LRTCS carries out research on communications in confined spaces, telecommunications in areas with low numbers of users, and wireless communications for process, machine, and robot control. UQAT's team of professor-researchers aims to position itself on the world stage with respect to research and training of highly qualified personnel in wireless communications.

#### **New Institutional Chair in Telecommunications**

Through the LRTCS, UQAT is working to implement a new research chair centred around telecommunications and the challenges of the mining industry in the era of the smart, environmentally-responsible mine, oriented towards the development of deeper mines.

**Thanks to its work and its partnerships, this Chair will contribute to the shift towards a mining industry 4.0; the next generation of smart and automated mining, by solving complex, previously intractable problems related to safety and productivity.**

**TIMETABLE**

Launch:  
**2021**



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## Institutional Chair in Development of New Communication and Automation Technologies for Smart Mines

Field:  
**Engineering**



### THE OPPORTUNITY

- The goal of research work is to provide better management of mine team safety through real-time tracking and continuous monitoring of the working process. Optimization of the mining process will also lead to increases in productivity for Quebec's mining industry;
- The chair will serve to reinforce studies in underground wireless communication networks in Quebec and Canada, helping to guide the mining industry towards implementing optimal solutions, new safety standards, and new opportunities for profitability.



#### Short-term Research Focus

- Mine-based, millimetre-band 5G antennas;
- Massive MIMO systems;
- Flexible antennas for wireless body networks;
- Millimetre-band smart antennas;
- Channel characterization and modelling in underground mines;
- Automation and control of mining vehicles.

#### Medium-term Research Focus

- Energy collectors and energy recovery;
- 5G Network slicing and clouding applied to transport systems in underground mines;
- Tracking.

### IMPACT

UQAT's various partnerships lead it to play a role in many projects centred around Abitibi-Témiscamingue's natural resources. Because this is the case, a multidisciplinary approach is preferred, to ensure successful project execution and to properly support our partners.

The LRTCS and the Chair in Development come under this umbrella and are involved in the following projects:

- The development of three innovation centres (Val-d'Or, Amos and Rouyn-Noranda);
- Development of a sustainable partnership with CanmetMINES (sharing of research infrastructure, staff, etc.);

- Active participation in the Centre d'excellence en connectivité minière [Centre of excellence in mining connectivity];
- Active participation in the Pôle de formation en enseignement supérieur in Abitibi-Témiscamingue's mining sector.

**The new chair aims to enhance the synergy between educational institutions in the region, basic and applied research, as well as university-level R&D, and the businesses in the region, in the province, in the country, and internationally.**

**The work stemming from the Chair will enable UQAT to position itself and its partners with regard to today's telecommunications issues, as well as those that will influence tomorrow's mining operations.**