

# The 6<sup>th</sup> Finnish National Colloquium of Geosciences 27<sup>th</sup>-29<sup>th</sup> October 2021 Oulu, Finland

## Organizing committee

Kari Strand	University of Oulu
Jukka-Pekka Ranta	University of Oulu
Ninna Immonen	University of Oulu

Geological Society of Finland (Suomen Geologinen Seura ry)

**Address:** P.O. Box 64 (Department of Geosciences and Geography)  
University of Helsinki, 00014  
Finland

**Website:** <http://www.geologinenseura.fi>



# Integrated development of geochemical and indicator mineral research techniques, and professional competence for ore exploration

PERTTI SARALA<sup>1,2</sup>, JANNE LAINE<sup>3</sup> AND ANTTI PERONIUS<sup>4</sup>

*1 Oulu Mining School, University of Oulu*

*2 Geological Survey of Finland*

*3 Indika Au Project, Sodankylä municipality*

*4 METSO Project, Lapland Education Centre REDU*

The mining industry is growing steadily in Finland. The most significant growth and strongest investment are focusing on Central Lapland and especially in Sodankylä. At the same time, there is increasing demand on developing services for the on-site indicator mineral concentration and analytical techniques as well as educating staff for the exploration companies need. To support the demands, two projects were launched in Sodankylä: the project 'Pilot testing and demonstrating on-site methods for mineral exploration in Sodankylä' (Indika Au) funded by European Research Develop Fund and lead by the Sodankylä municipality, and the project 'Development of competence for ore exploration and research' (METSO) funded by the European Social Fund and lead by the Lapland Education Centre REDU, Sodankylä. Partners are the Geological Survey of Finland and the Oulu Mining School.

An aim of the Indika Au project is to produce practical information on new on-site mineral exploration methods to develop the service offering and new operation opportunities in the exploration business and to reduce the environmental impact. The project will produce experimental data for the assembly of a mobile unit suitable for mineral exploration with a view to on-site pre-treatment and analysis of soil and weathered bedrock samples related to indicator mineral exploration directly in the field or at a field camp. The methodological development is focusing especially on techniques suitable for gold prospecting, but the methods are also suitable for exploring many other types of ores, such as critical metals needed for high-technology and batteries. Sample pre-processing and analytical testing directly on the exploration site reduces the need to transport samples, enables a rapid and resource saving research process, lower environmental impact, and provides an opportunity for new business and operating models in a key exploration area, in Central Lapland.

An aim of the METSO project is to increase the technical know-how of subcontractors doing simple ore research, for example by providing sampling services, field pre-processing and analyses, to improve and expand their product range and thus add value to their products. In addition, REDU will develop educational packages to further educate people in some related field, such as the civil engineering side of the business so that they could develop their services to suit better in the ore exploration and thus expand their service offerings extractive industries or, at best, create a whole new SME business in northern Finland. During the project, the readiness of teachers at REDU will be increased by giving professional geoscience education and producing teaching materials in the field of modern ore exploration, and by planning and piloting exploration projects and equipment procurement. Based on the competence needs of companies, locally offered degree components or entities consisting of already existing degree components are planned. The project will create and pilot at least two training modules including, for example research assistant and technician who have readiness to work in challenging Arctic conditions and are experienced in modern field techniques in ore exploration.