

## Multivariate geostatistics applied to mining residues

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**Scholarship period:** 01/09/2022 – 31/12/2022

### Background and objectives:

Considering the increasing importance of lowering the environmental impacts on land and water bodies of mining activities and the increasing demand for raw materials, it is becoming more and more necessary to evaluate environmental impacts as precisely as possible, in addition to a precise characterization of valuable elements for potential recovery from mining residues.

The scholarship intends to study in-depth the topic of multiple data sources integration (remote, ground-based, labs, etc..). Applying multivariate geostatistics over different variables characterizing mining residues, it is possible to increase the precision of estimations, at the same time decreasing drilling and sampling costs. The main challenge resides in the correct management of data with different origin and support; in this regard, various techniques will be approached, such as the regularization and aggregation methods.

### Potential:

Multivariate geostatistics can be applied in various fields such as monitoring material streams in mining areas, sampling optimization in stockpiles/tailings, grade mapping of raw material, and environmental monitoring. Therefore, it can contribute to successfully characterize and identify mineral potential at different scales and to provide solutions for impact monitoring of mining activities.

### Activities

Tasks	MONTHS			
	1	2	3	4
Deepening of multivariate geostatistics				
Literature review and analysis of similar applied research				
Application of tools over a case study of mining residue (from INCO-Piles Project)				
Final report and presentation of the work				