

Joint PhD position at Polytechnique Montreal and Université de Montpellier.

“Multi-scale approach to study the effect of fines content and particle shape on static liquefaction potential of loose mine tailings”

Mine tailings are silty sand slurries deposited by hydraulic filling in storage facilities, where the material remains saturated, loose, and might be liquefiable causing catastrophic mudflows. Empirical evidence shows that intrinsic material parameters, such as characteristic particle size, particle size distribution, and non-plastic fines content, could significantly affect tailings liquefaction potential. However, key elements and physical mechanisms at the source of these observations remain unclear. The main objective of the proposed PhD project is to develop a general multi-scale framework to assess the static liquefaction potential of loose tailings as a function of fines content and grain shape, based on experimental testing and numerical DEM simulations.

We offer a fully-funded 4-year PhD position, as part of a collaboration between academic institutions, Polytechnique Montréal (Canada) and Université de Montpellier (France), and industrial partners SRK Consulting (Canada) and Peñoles Mining Company (Mexico).

Candidates must have experience with numerical modeling of materials. Experience with experimental set-up and testing of geomaterials, although not necessary, is highly appreciated. Programming skills with python are essential. Students having a Mechanical/Civil Engineering or Physics background are invited to apply.

We invite the candidates to send a detailed CV (including the contact details for 2 references), a motivation letter and Bachelor and Master transcripts to Prof. Carlos Ovalle ([carlos.ovalle@polymtl.ca](mailto:carlos.ovalle@polymtl.ca)) & Prof. Emilien Azéma ([emilien.azema@umontpellier.fr](mailto:emilien.azema@umontpellier.fr)).

Note: The recruitment process will ensure that the principles of equity, diversity and inclusion are respected, and in the case of equal skills among candidates, preference will be given to the recruitment of women, underrepresented minorities, and individuals with disabilities.