

A Quantitative Risk Assessment for fragmental rockfall

Permafrost and rock degradation, massive glaciers retreat by global warming effects of climate change have a direct impact on mountain areas, with a significant increase of rockfall phenomena. Climate trends indicate that their frequency is expected to increase throughout the foreseeable future: the growing number of people and infrastructure in mountain regions increases the vulnerability of high-mountain areas, underlining the urgency for rockfall hazard and risk assessment. The need of recognizing and accurately predicting rockfalls and their effects is thus becoming urgent, to create safe and resilient mountain infrastructures and open pit working places.

RIDETHERISK aims at (i) improving the knowledge and predictability of rockfall hazard and its consequences, i.e. the risk, developing a new physically-based method to simulate rockfall propagation accounting for rock block fragmentation upon impact and (ii) quantifying the damages in different contexts, civil and industrial (i.e. mining), filling a knowledge gap in understanding this natural phenomenon and its effects, and increasing awareness of its destructive potential.

The 3 main project objectives are:

- to enhance rockfall hazard prediction defining analytical solutions to predict fragmentation and implementing a physical-based trajectory model for fragmental rockfall;
- to develop a fully time-integrated quantitative risk assessment method for fragmental rockfalls able to quantify social and economic damages on transportation infrastructures and open pit mining activities;
- to facilitate and promote the use of the developed method, applying it in two real contexts (Alpine environment and mining one), and realizing technical guidelines for experts, proposing their adoption to policy-makers and activity owners to properly manage the risk.

The project will take place at University of Newcatle – Australia for 18 months e in a 12 months returning phase at Politecnico di Torino.



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PROJECT DURATION

30 months

(from 1 November 2023 al 30 April 2026)

PARTNER

- University of Newcastle (Australia) – College of Engineering, Science and Environment - CESE

FUNDING INSTRUMENT

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BUDGET

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POLITO and DIATI's role:

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Scientific Supervisor: Prof. Daniele Peila