

Post-conference Workshops

Saturday 17/02/2024 - Full day (9 am – 1 pm & 2pm – 6pm)

Hotel Porta

Post-2: From the laboratory to the natural scale in debris flows hazard modeling: the challenge of upscaling

English* / Participants: 10 – 20 / Cost: 10 US\$

* Taller bilingüe, en inglés y español / Both Spanish and English speakers are welcome

Volcaniclastic debris flows, like other natural gravity flows, are difficult to simulate accurately because of their complexity in terms of number of phases (liquid phase, solid phases of different size, density, and shape), rheology (from pure granular flow to mudflow rheologies), coexisting and concurrent processes (bulking/debulking), etc. Often these properties and processes vary within the same flow and along the flow propagation. It is therefore evident that a reliable model of debris flows to be implemented in simulation tools for hazard quantification should take most of these complexities into account whilst retaining acceptable simulation run times.

To achieve this goal, the research community is making an effort by means of laboratory (e.g., standard rheometry) to large-scale experiments (e.g., flows in flumes) and numerical models of various degrees of complexity. Whilst this is a reasonable approach, care should be taken in considering the restrictions posed by the unavoidable scaling in the experiments, even on a large-scale and model simplification. Therefore, a further effort needs to be made to achieve a proper upscaling of the knowledge gained by laboratory and numerical experiments towards an implementation of this new knowledge into the models used for hazard quantification applications.

In this workshop we welcome the community working on the different aspects of debris flows modeling with the aim to discuss how to improve the models implemented in the simulation tools. Specifically, we would like to tackle the challenge of upscaling the knowledge gained by laboratory experiments (e.g., rheology measurements) and particle-scale numerical simulations.

Each topic will be addressed by our keynote speakers:

- Dr. Irene Manzella – Large-scale experiments
- Dr. Jeremy Phillips – Numerical modelling
- Dr. Lucia Capra – Hazard analysis

Workshop organizers:

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