



# Rock Slope Stability 2021

## International Symposium Rock Slope Stability 2021

### Program

*17 & 18 November 2021*

*Centre de Congrès « Le Manège »*

*331 rue de la République - 73000 Chambéry (France)*

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### Symposium organized by:



Chutes de Blocs  
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Rock Slope  
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## Wednesday 17 November 2021

- 12:00pm** Welcome of the participants
- 01:30pm** Opening
- 02:00pm** **Keynote “30 years of Rockfall Engineering research at Polito”** (Auditorium – Ground Floor)
- 02:40pm** **Keynote “The Cliets, two major rockfalls at the Arly river (2014, 2019, Savoie, France)”**  
(Auditorium – Ground Floor)
- 03:20pm** **Session 1A – Risk Management** (Auditorium – Ground Floor)  
**Session 1B – Site investigation and rockfall hazard modeling** (Room B - Ground Floor)
- 04:00pm** Coffee-break (1<sup>st</sup> Floor)
- 04:20pm** **Session 2A – Protective structures** (Auditorium – Ground Floor)  
**Session 2B – Site investigation and rockfall hazard modeling & Risk Management**  
(Room B - Ground Floor)
- 06:00pm** End of the day

## Thursday 18 November 2021

- 09:00am** **Keynote “Mitigation and protection of the rocky risk on urban stakes, a complex and large-scale operation, the Mont Faron in Toulon.”**(Auditorium – Ground Floor)
- 09:40am** **Focus on sponsors** (Auditorium – Ground Floor)
- 09:50am** Coffee-break (1<sup>st</sup> Floor)
- 10:20am** **Session 3A – Rockfall propagation** (Auditorium – Ground Floor)  
**Session 3B – Risk Management & Monitoring techniques and survey** (Room B - Ground Floor)
- 12:20pm** Lunch (1<sup>st</sup> Floor)
- 02:00pm** **Keynote “Inspection, assessment and maintenance of rock slopes and excavated caverns of hydroelectric schemes for safety and sustainability”** (Auditorium – Ground Floor)
- 02:40pm** **Session 4A – Rockfall propagation** (Auditorium – Ground Floor)  
**Session 4B – Monitoring techniques and survey** (Room B - Ground Floor)
- 04:00pm** Coffee-break (1<sup>st</sup> Floor)
- 04:20pm** **Session 5A – Protective structures** (Auditorium – Ground Floor)  
**Session 5B – Case studies** (Room B - Ground Floor)
- 05:40pm** End of the Symposium



- 12:00pm** Welcome of the participants
- 01:30pm** Opening (Auditorium – Ground Floor)
- 02:00pm** **Keynote “30 years of Rockfall Engineering research at PoliTO” - Valerio De Biagi Politecnico Turin - Italie** (Auditorium – Ground Floor) - Chairman : Stéphane Lambert
- 02:40pm** **Keynote “The Cliets, two major rockfalls at the Arly river (2014, 2019, Savoie, France)” - Anne Lescurier / Lionel Lorier CD73 / SAGE - France** (Auditorium – Ground Floor) – Chairman : François Nicot
- 03:20pm** **Session 1A – Risk Management** (Auditorium – Ground Floor) – Chairman : Carine Peisser
- 03:20** A rockfall risk database for the French Alps - Nicolas Eckert (INRAE, France)
  - 03:40** Quantitative rockfall risk analysis for railway using 2D block propagation simulations - Manon Farvacque (INRAE, France)
- 03:20pm** **Session 1B – Site investigation and rockfall hazard modeling** (Room B - Ground Floor) – Chairman : Muriel Gasc
- 03:20** Assessment of the stability of the Bonifacio cliff in the Citadel sector - Alain Thoraval (INERIS, France)
  - 03:40** Contribution of Artificial Intelligence models for the management of rockfall risks - Marie-Aurélié Chanut (Cerema, France)
- 04:00pm** Coffee-break (1<sup>st</sup> Floor)
- 04:20pm** **Session 2A – Protective structures** (Auditorium – Ground Floor) – Chairman : Nicolas Villard
- 04:20** 5 MJ energy impact test on a slender reinforced soil embankment - Oltion Korini (Terre Armée, France)
  - 04:40** A new method for the design of rockfall fences by surrogate modelling - Loïc Dugelas (NGE Fondations)
  - 05:00** An innovative Early Warning System for rockfall and debris flow protection structures - Alberto Grimod (Maccaferri, France)
  - 05:20** High energy impacts for assessing the Bloc Armé® technology as rockfall protection - Agathe Furet (Géolithe, France)
  - 05:40** Bringing certified rockfall barriers to their realistic limits - Hélène Hofmann (Geobrugg, Suisse)
- 04:20pm** **Session 2B – Site investigation and rockfall hazard modeling** (Room B - Ground Floor) – Chairman : Clara Levy
- 04:20** Modelling Rock Wall Permafrost to Understand Rock Slope Failure - Florence Magnin (Université Savoie Mont-Blanc, France)
  - 04:40** Presentation of a methodology for determining rockfall hazard – Camille Halbwachs (Géolithe, France)
  - 05:00** Forecasting damming scenarios using Shallop model - Clara Lévy (BRGM, France)
  - 05:20** Estimating rockfall release scenarios based on a simple rockfall frequency tool - Christine Moos (Université de Lausanne, Suisse)
  - 05:40** Seeking improvements to landslide operational management through case studies – Pauline Chollier (INRAE, France)
- 06:00pm** End of the day



**09:00am** **Keynote “Mitigation and protection of the rocky risk on urban stakes, a complex and large-scale operation, the Mont Faron in Toulon.” – Géraldine Crespin, Laurent Sannier/ Metropole Toulon Provence Méditerranée – Emmanuel Kopp / Ville de Toulon – L. Meignan / Géolithe, France** (Auditorium – Ground Floor) – Chairman: Marie-Aurélié Chanut

**09:40am** **Focus on sponsors: commercial videos (Geobruigg / GINGER CEBTP)** (Auditorium – Ground Floor)

**09:50am** Coffee-break (1<sup>st</sup> Floor)

**10:20am** **Session 3A – Rockfall propagation** (Auditorium – Ground Floor) – Chairman: Marie-Aurélié Chanut

- 10:20** Effect of sample size on the prediction of survival probability of brittle spheres - Olivier Buzzi (Université of Newcastle, Australia)
- 10:40** ELANA (Energy Line Angle Normalized Area): a tool to aid rockfall propagation mapping - Clara Lévy (BRGM, France)
- 11:00** Objective comparison of block propagation models using the Platrock platform - Franck Bourrier (INRAE, France)
- 11:20** RAMMS Model Updates - Soil Scarring, Trees and Rotational Stability - Marc Christen (WSL, Suisse)
- 11:40** Influence of scrubs on rockfall dynamics - Adrian Ringenbach (WSL, France)
- 12:00** Small scale rock fall experiments and statistical laws for run-out - Dominique Daudon (3SR, France)

**10:20am** **Session 3B – Risk Management & Monitoring techniques and survey** (Room B - Ground Floor)  
– Chairman : Florence Belut / Clara Lévy

- 10:20** Digitization and Building Information Modeling of rockfall protection's worksites - Clément Galandrin (CAN, France)
- 10:40** Harmonisation of calculation and design methods for unstable slopes: the case of Marrakech – Ouarzazate road - Imane Jabri (Sidi Mohamed Ben Abdellah University, Maroc)
- 11:00** Innovative rockfall alarm system with automatic road closure at Axenstrasse, Switzerland - Severin Stahly (Geopraevent, Suisse)
- 11:20** Feedback on the 4D monitoring and assessment of rockfall and hanging glacier stability - Johan Berthet (STYX 4D, France)
- 11:40** Feedback on four exemplary early warning systems for landslides - Stella Coccia (INERIS, France)
- 12:00** Comparison of the effectiveness of the InSAR method in rocky areas and forested areas – Vincent Hugues (Cementys, France)

**12:20pm** Lunch (1<sup>st</sup> Floor)

**02:00pm** **Keynote “Inspection, assessment and maintenance of rock slopes and excavated caverns of hydroelectric schemes for safety and sustainability” – Marco Quirion / HYDRO QUEBEC, Canada** (Auditorium – Ground Floor)  
– Chairman : Félix Darve

**02:40pm** **Session 4A – Rockfall propagation** (Auditorium – Ground Floor) – Chairman : Franck Bourrier

- 02:40** Results of Real Scale Block Shape/Mass Experiments, Chant Sura, Switzerland - Andrin Caviezel (SLF, Suisse)
- 03:00** Modelling Rotational Drag in Rockfall Dynamics - Jessica Munch (WSL, Suisse)
- 03:20** Determining realistic rockfall runout zones using simulated reach probability maps - Luuk Dorren (Université des Sciences appliquées, Suisse)
- 03:40** Mapping release areas and mobility of rockfall and rock avalanches in the French Alps high mountain - Maeva Cathala (INRAE, France)

**02:40pm** **Session 4B – Monitoring techniques and survey** (Room B - Ground Floor)- Chairman : Florence Magnin

- 02:40** Temperature distribution in a permafrost-affected rock ridge from conductivity and induced polarization tomography - Pierre-Allain Duvillard (STYX 4D, France)
- 03:00** Preventive maintenance and non-destructive monitoring of rock anchors - Corinne Horb (RINCENT ND Applications, France)
- 03:20** TLS- and inventory-based Magnitude Frequency relationship for rockfall in Montserrat and Castellfollit de la Roca - Marc Janeras (Universitat Politècnica de Catalunya, Spain)
- 03:40** Monitoring unstable slopes with passive RFID - Mathieu Le Breton (Géolithe, France)

**04:00pm** Coffee-break (1<sup>st</sup> Floor)

**04:20pm** **Session 5A – Protective structures** (Auditorium – Ground Floor) – Chairman : Stéphane Lambert

- 04:20** DEM Modelling of the ELITE rockfall flexible barrier: a new net model introducing sliding - Loic Dugelas (NGE Fondations, France)
- 04:40** Forest flexible fences: increasing their energy capacity - Ignacio Olmedo (NGE Fondations, France)
- 05:00** Assessment of the robustness of a numerical model of Bloc Armé® rockfall protection walls considering high energies impacts on real-scale structures - Agathe Furet (Géolithe, France)
- 05:20** Numerical modelling of full-scale rockfall protection structures under dynamic impact using discrete element method – Ali Rafiee (Ginger BEBTP, France)

**04:20pm** **Session 5B – Case studies** (Room B - Ground Floor) – Chairman : Carine Peisser

- 04:20** Coastal cliff landslide susceptibility in Essaouira – Morocco - Abdellah Khouz (Universidade de Lisboa, Portugal)
- 04:40** Unusual Debris Characteristics from the February 17, 2006, Guinsaugon, Leyte, Philippines, Rockslide - Marte Gutierrez (Colorado School of Mines, USA)
- 05:00** Rock slope cutting works near fragile speleothems: Choranche case study (Vercors, France) - Pierre Bottelin (ADRGT, France)
- 05:20** Inventory of ground instabilities on the western Mediterranean coast of Morocco (case of the region between Tetouan and Jebha) - Haytam Tribak (Ecologie Fonctionnelle et Génie de l'environnement, Maroc)

**05:40pm** End of the Symposium