

# Insights on Debris Flow Growth: Collisions and Contractile Skins

## Webinar

**Dr Clarence E. Choi**

*Department of Civil Engineering, The University of Hong Kong*

**Date & Time: 6<sup>th</sup> July 2021 (Tue), GMT+8 (HKT) 6:30pm**

### ABSTRACT

Debris flows are perhaps the most unique type of landslide because of their ability to grow several orders of magnitude in size from initiation to deposition. In this study, a review of existing theoretical, experimental, and field data on debris flow erosion is carried out. New insight and scaling is proposed to highlight the importance of collisional and capillary stresses on the erosion process. The proposed scaling is evaluated using unique physical model tests. Collisional stress induced by the flow on a soil bed should not be overlooked because it significantly governs debris flow erosion. The assumption of a saturated soil bed underestimates erosion at low bed water contents. Not to mention soil beds are seldom saturated when landslides occur. The importance of advanced numerical tools that can capture the spatial variation of collisional stress in a flow, particularly the collisional front, and the hydro-mechanical properties of the soil bed is revealed. The sensitivity of soil bed erosion to capillary stresses shows the importance of soil-atmospheric interaction for debris flow growth. This webinar is an extended version of the ISSMGE Bright Spark Lecture 2021

### THE SPEAKER

Dr Clarence E. Choi is Assistant Professor of Civil Engineering at the University of Hong Kong. Before joining the University of Hong Kong, he was Research Assistant Professor of Civil Engineering at the Hong Kong University of Science and Technology (HKUST) and Junior Fellow of the HKUST Jockey Club Institute for Advanced Study. His research focuses on sustainable development and climate resilience against landslides.

He was awarded the Bright Spark Award from the ISSMGE, Telford Premium Prize by the ICE and the R.M. Quigley Award by the Canadian Geotechnical Society. He serves as Chair of the Debris Flow and Steep Creek Hazards Mitigation Committee of the Association of Geohazards Professionals, Chair-nominated member of TC208 of ISSMGE on slope stability, Board member of the International Consortium of Landslides of UNESCO, a nominated member of the Joint Technical Committee 1 on natural slopes and landslides of the joint Federation of the International Geotechnical Societies, and an Editorial Board Member of the journal Landslides.

(email: [cechoi@hku.hk](mailto:cechoi@hku.hk); web: <http://www.cechoi.org>)

### Registration & Enquiries:

This Lecture is free of charge. For HKIE members, please register online via the website at <https://hkieged.org/public/technical-activity>. Overseas applicants may register at <https://forms.gle/xRqS1BnyzstGUBjh6>. Successful applicants will be noticed individually. For enquiries, please contact Dr Andy Leung at [andy.yf.leung@polyu.edu.hk](mailto:andy.yf.leung@polyu.edu.hk).