



DEPARTMENT OF CIVIL ENGINEERING

SEMINAR

**Dynamics of Debris Flows: Analysis of Seismic Signals
from Laboratory Experiments and Field Observations**

Dr. Yifei CUI
Tsinghua University
China

Date: November 29, 2024 (Friday)

Time: 1:00 p.m. – 2:00 p.m.

Venue: Room 632C, 6/F Haking Wong Building, The University of Hong Kong

Abstract

Debris flows are among the most prevalent geological hazards in mountainous regions, and a precise comprehension of their dynamic processes is essential for effective disaster early warning and mitigation. Recent developments in environmental seismology have facilitated the utilization of seismic signals for the inversion and early warning of debris flow dynamics. However, the effectiveness of seismic signal-based dynamic inversions may be compromised by inadequate consideration of flow properties and topographic conditions. In this study, we conducted laboratory flume experiments to establish a quantitative link between flow characteristics and seismic signals. Concurrently, we employed seismic signal inversion outcomes to refine and optimize numerical simulations at the field scale, supported by several case studies. This research contributes to a deeper theoretical understanding of geohazard mechanisms and lays the groundwork for developing a predictive framework for debris flows, aimed at early warning and hazard mitigation.

About the Speaker

Dr. Yifei Cui is currently an associate professor in Department of Hydraulic Engineering, Tsinghua University in the field Engineering Geology and Geotechnical Engineering. He obtained his M.Sc. and Ph.D. in Geotechnical Engineering from the University of Alberta, Canada. His research focuses on physical and mechanical behavior of granular materials, soil internal erosion, debris flow mitigation measures, and seismic techniques for the monitoring of geological hazards. He has published 50 peer-review papers in top international journals, such as National Science Review, Science Bulletin, Geophysical Research Letters, Géotechnique, Water Resources Research with over 2000 citations. He has an excellent record of accomplishment with an H-index of 28 according to the google scholar database. Dr. Yifei Cui is the individual member of IAEG, ICGdR, ISSMGE. His is also serving as the Associate Editor of Journal of Geophysical Research: Earth Surface. He has received IAEG Richard Wolters' prize in 2021, and ICGdR Outstanding Young Scientist Award in 2022.

- ALL ARE WELCOME -