

CUS Biogeotechnics Online Seminar Series

Microbial-Mineralization in Soil: Applications in Geotechnical and Geoenvironmental Engineering

Date: 17 November 2023 (Friday)

Time: 10:30 am to 11:30 am (Singapore Time)

Platform: MS TEAMS (The “Join event” link will be in the confirmation email.)

Organised By: Centre for Urban Solutions (CUS), School of Civil and Environmental Engineering (CEE), Nanyang Technological University, Singapore

Registration (Free): Please click the link below to register.

<https://events.teams.microsoft.com/event/e88747f2-2511-4637-ad7d-318b5cfc6c4@15ce9348-be2a-462b-8fc0-e1765a9b204a>

PDUs: Pending from Professional Engineers Board Singapore

About the Online Seminar

Traditional soil mechanics has viewed soil as a three-phase system of solid particles, water, and air, excluding the effects of biological activities. However, studies in soil science and environmental science have shown that microorganisms can significantly affect the soil's physical, chemical, and biological properties. Microbial-induced calcium carbonate precipitation (MICP) has recently become a focus in bio-geotechnics. This method utilizes urease-producing bacteria to hydrolyze urea, increase environmental alkalinity, and facilitate the precipitation of calcium carbonate crystals, which can cement soil particles and enhance soil strength. MICP can also remediate heavy metal-contaminated soils by precipitating the metals as carbonates and hydroxides, reducing their mobility. This presentation will explore the applications of MICP in preventing hydraulic erosion, reinforcing calcareous sand foundations, and stabilizing polluted soils, providing an in-depth analysis of the methods, results, and potential benefits of MICP, as well as the challenges it faces in practical implementation.

About the Speaker



Professor Ningjun JIANG is currently a full Professor of Geotechnical Engineering and Interim Vice Director of Graduate School at Southeast University (SEU), China. He received his PhD degree from University of Cambridge, UK. Prior to joining SEU, he was an Assistant Professor at University of Hawaii at Manoa, USA. His research areas include bio-mediated geotechnics, soil remediation, and ground improvement. Professor Jiang has published more than 80 international journal and conference papers, which have been cited by more than 3,000 times. He is the recipient of several academic awards, including Fredlund Award in 2019, Acta Geotechnica Best Paper Award in 2020, Soils and Foundations Editorial Board Member Award in 2021, and 75th Géotechnique Anniversary Early Career Award in 2023. Professor Jiang is an Associate Editor of the newly launched journal Biogeotechnics and an editorial board member of Environmental Geotechnics. Previously, he was also an editorial member of Soils and Foundations.