MBCMG2024

2nd International Conference on Microbial Biotechnology in **Construction Materials and Geotechnical Engineering**

13 - 16 August 2024

Singapore

In Conjunction with

PROTECT2024

9th International Colloquim on Performance, **Protection & Strengthening of Structures Under Extreme Loading & Events**

This conference has been awarded 18 PDUs by Singapore PE Board

KEYNOTE SPEAKERS



Edward **KAVAZANJIAN** Arizona State University USA



Jason DEJONG University of California, Davis USA



QIAN Chunxiang Southeast University China

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INVITED LECTURES

Chongqing University Nanyang Technological University







TANG Chaosheng Nanjing University China



Brina MONTOYA North Carolina State University USA



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Yang

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LI Chi Inner Mongolia University of Technology China



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Geotechnical Society of Singapore (GeoSS) ISSMGE Technical Committee TC211 on Ground Improvement ISSMGE Technical Committee TC217 on Land Reclamation American Concrete Institute (Singapore Chapter) **BioGeotechnics (An International Journal)**

CONTACTS:

Asst Prof SHI Chao: chao.shi@ntu.edu.sg Dr WU Shifan : <u>sfwu@ntu.edu.sg</u> Dr WANG Kangda : <u>kangda.wang@ntu.edu.sg</u> **WEBSITE:**

SPECIAL SESSION 1

Microbial Biomineralization: From Fundamentals to Sustainable Construction and Geo-Environmental **Applications**

Session host: Cao Bin

Description:

Microbial biomineralization is the bio-chemical process by which solid minerals such as calcium carbonate are precipitated from the environment. Compared with conventional chemical processes for the formation of solid minerals, microbial biomineralization is more environmentally friendly and provides a promising technical route to low-carbon construction. In addition, microbial biomineralization also provides a solution to containing toxic environmental contaminants such as heavy metals and preventing their further spread to the surrounding environment. In this session, we invite submissions that tackle emerging challenges in all aspects of fundamentals and/or applications of microbial biomineralization. The relevant topics include, but not limited to,

- Engineering biomineralization processes through synthetic biology and bioengineering approaches
- Novel microbial or enzymatic processes for biomineralization
- Applications in construction and geotechnical engineering
- Applications in environmental remediation and resource recovery
- Techno-economic analysis (TEA) and life cycle assessment (LCA) of microbial biomineralization in various applications

SPECIAL SESSION 2

Utilization of solid wastes and environmental applications

Session host: Yi Yaolin and Fei Xunchang

Description:

A wide range of solid wastes has been generated due to the rapid growth of population and economy. Examples of solid wastes are construction and demolition wastes, municipal solid wastes, incineration bottom ash, incineration fly ash, mining and tailing waste, dredged river/marine sediment, steel slag, etc. Reusing solid wastes reduces the strain on natural resources, minimizes landfill waste, and conserves energy, contributing to a more sustainable and eco-friendlier environment. Given the wide variety of solid wastes, their environmental applications, impacts, health risks, and regulatory measures are yet to be fully understood and developed.

This sub-session aims to provide a forum for researchers to present and discuss the utilization of solid wastes and environmental applications, including 1) recycling and upcycling innovations, 2) circular economy strategies, 3) sustainable construction materials, 4) environmental impact and risk assessments and other related topics. The insights, pioneering research, and discussions on real-world applications by researchers will promise to enhance waste management practices, conserve resources, and promote a healthier environment.

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WEBSITE:

SPECIAL SESSION 3

Emerging Technology and Green Innovations in Construction Materials and Geotechnical Applications

Session host: Shi Chao and Viroon Kamchoom

Description:

The construction industry is in the midst of a transformative era, where technology and innovative materials are playing a pivotal role in shaping the future of construction and geoenvironmental engineering. This special session aims to provide a forum for researchers, practitioners, and industrial professionals to share their latest findings, insights, and experiences on emerging technologies and sustainable green innovations in construction materials and geoenvironmental applications. It will cover a wide range of related topics, including but not limited to the following:

- Data analytics, digital twin, and machine learning in characterization, modelling, interpretation, and performance prediction of innovative construction materials
- AI-aided design and optimization of construction materials
- Bio-geotechnology such as the use of vegetation and bacteria
- Green technologies for erosion control and coastal protection
- Renewable energy integration with construction materials

SPECIAL SESSION 4

Self-healing Materials

Session host: Yang En-Hua and Qian Shunzhi

Description:

This special session focuses on recent progress and latest findings on the development of microbial-induced self-healing materials, their applications and case studies. Relevant topics in this session including but are not limited to:

- Novel technologies and approaches to enhance microbial-induced self-healing in materials
- Microbial engineering and microbial genetic engineering to enhance microbial-induced calcite precipitation (MICP) for self-healing materials
- Mechanism study of microbial-induced self-healing in materials
- Advanced microbial encapsulation and immobilisation technology for self-healing materials
- Novel methods to evaluate quantity and quality of microbial-induced self-healing in materials (in terms of durability and mechanical properties)
- Long-term efficacy of microbial-induced self-healing materials
- Applications and cases studies of microbial-induced self-healing materials

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WEBSITE:





REGISTRATION & FEES (USD)

Registration will be available online through the conference website.

	General	Author	Student
Before May 16, 2024	\$750	\$650	\$300
After May 16, 2024	\$900	\$800	\$450

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