



# Graduate Seminar

## Emmanuel Salifu, PhD

Assistant Professor in the School of Sustainable Engineering  
and the Built Environment at Arizona State University

April 7, 2025 (4:00 pm - 5:30 pm), Tiernan Hall 106

[Zoom Link: Click Here](#)

Meeting ID: 994 3917 6432 Passcode: 058807

## Fungi Geotechnics: Emerging Concepts, Mechanisms, Applications, and Future Directions

### Abstract

Fungi are, in many ways, nature's underground engineers--forming expansive mycelial networks that transform the physical and chemical properties of soils, with the potential to influence hydro-mechanical behavior critical to geotechnical engineering. This seminar introduces Fungi Geotechnics, an emerging interdisciplinary research area at the intersection of geotechnical engineering, environmental microbiology, and biotechnology. Drawing from ongoing laboratory-scale experiments and conceptual developments, the talk explores how fungal growth and metabolic activity impact soil structure, water retention, and mechanical behavior through mechanisms such as hyphal entanglement, biochemical secretions, biopolymer production, and biomineralization. Experimental case studies on fungal-mediated modification of soil hydraulic properties, strength enhancement, and mitigation of wind- and water-induced erosion will be presented. The seminar will also address current challenges and future directions for translating fungal processes into scalable, eco-adaptive technologies for sustainable geotechnical infrastructure.

### About the Speaker

*Emmanuel Salifu is an Assistant Professor in the School of Sustainable Engineering and the Built Environment at Arizona State University. His research bridges geotechnical engineering and soil science, mycology, environmental biotechnology, and microbial ecology to develop nature-based ground improvement solutions. He is a pioneer in the emerging research area of fungi geotechnics, exploring how fungi can beneficially modify soil behavior, enhance strength, and increase resistance to erosion, among other applications. Dr. Salifu holds a dual Ph.D. in Civil and Environmental Engineering from the University of Strathclyde, Glasgow, UK, and the University of Napoli Federico II, Italy. Before joining the ASU faculty, he was a member of the university's inaugural cohort of Presidential Postdoctoral Fellows and an awardee of the Momental Foundation's Mistletoe Research Fellowship. His work advances a research vision for biologically inspired, microbially mediated infrastructure systems that are resilient, ecologically aligned, and self-adaptive to extreme environmental conditions.*



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