

GRANULAR DRAG: FROM FUNDAMENTALS TO APPLICATIONS

Speaker

Prof. Kai Huang

Duke Kunshan University, Jiangsu, China

Abstract

'Nothing is built on stone; all is built on sand, but we must build as if the sand were stone,' a quote by Jorge Luis Borges, vividly describes the influence of sand grains on the civilization process happening throughout the past century, and continuing till now. However, do we really understand the mechanism behind granular rigidity and its dependence on the 'microscopic' properties of individual sand grains and interactions in-between? In this talk, I will use projectile impact and auger drilling as two examples to illustrate how granular media respond to external intruders with an emphasis on applications. In addition, I will also provide a brief overview of how to effectively trace objects embedded in a granular medium with an overview of challenges and opportunities associated.

Biography

Dr. Kai Huang is a Professor of Physics in the Division of Natural and Applied Sciences at Duke Kunshan University. He earned his B.Sc in Electronic Engineering and his Ph.D. in Physical Acoustics from Nanjing University. He completed his postdoctoral training at the Max Planck Institute for Dynamics and Self-Organization before joining the University of Bayreuth as a group leader and lecturer, where he obtained his habilitation in physics in 2014, a prestigious scientific and pedagogic qualification in Germany. Dr. Huang joined Duke Kunshan in 2019 and was appointed Chair of the Department of Natural and Applied Sciences, which has since grown to include 60 faculty members. He currently serves as the Dean of Research and Lab Infrastructure.

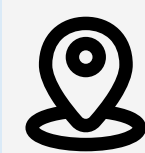
As a soft matter physicist, his research centers on the collective dynamics of particulate materials, shedding light on widespread applications in civil and process engineering, as well as the geo- and environmental sciences. He also pursues research on the acoustical design of traditional European and Chinese opera theaters. His interdisciplinary projects are notably diverse: he has developed novel imaging techniques to "see" through sand, utilized X-ray tomography to investigate how roots penetrate soil, and built microfluidic devices to study algae-bacteria interactions in nearby Lake Tai. The work is aimed at finding solutions to toxic algal blooms. His research has been funded by the German Research Foundation (DFG), the Sino-German Center for Research Promotion, and the State of Bavaria.



12 October 2026
Monday



10:30 am - 11:30 am



Room 3574 (Lift 27/28)
Civil Engineering
Conference Room
HKUST

Enquiry:

Ms. Rebecca Yau
cerebeca@ust.hk