中国科学院武汉岩土力学研究所
Institute of Rock and Soil Mechanics,Chinese Academy of Sciences

岩土力学与工程前沿讲坛

Forum on Geomechanics and Geo-engineering

No.SKL*2025-14*

应岩土力学与工程安全全国重点实验室邀请，澳大利亚悉尼大学 Yixiang Gan（甘益翔）教授来访交流并作学术报告，报告信息如下:

报告人 Lecturer	**Yixiang Gan (甘益翔)　教授**
报告题目 Theme	**Granular Flow in a Rotating Drum: From Dry, Wet, to Submerged Conditions**
报告时间 Time	**2025 年 8 月 26 日（周二）上午 09:00**
报告地点 Spot	**武汉岩土所研发大楼四楼 2 号会议室**

欢迎广大科研人员及研究生参加!

岩土力学与工程安全全国重点实验室
State Key Laboratory of Geomechanics and Geotechnical Engineering Safety

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报告简介

Understanding granular flow is of vital importance in many geophysical problems and industrial applications, such as landslides, mineral handling, additive manufacturing, and food processing. We investigated rheological and segregation behaviour of granular media in a rotating drum, exhibiting dependency on interstitial fluids. From dry, wet (partially saturated) to submerged conditions, we conduct experiments and numerical simulations to study granular flows in rotating drums. In wet conditions, we focus on varying the strength of cohesion (surface tension) and rotation conditions within the modes of rolling and cascading flow. We extract statistical information on the formation of clusters and find a power law relation between the cluster size distribution and characteristic cluster size distributions. For fully dry or submerged conditions, numerical results show excellent match with experimental observations from mono- and binary systems, whilst revealing the rich internal dynamics. The observations from experiments and simulations reveal four distinct mixing states—from well mixed states to complicated density-driven segregation patterns with increasing numbers of vortices. Finally, we will discuss how intestinal fluids impact on the flow and its implications on industrial processes.

报告人介绍

Yixiang Gan（甘益翔）教授现任职于澳大利亚悉尼大学，土木工程学院副院长（主管外事）。在德国卡尔斯鲁尔理工学院（KIT）取得工程科学博士学位，论文成绩达到德国最高荣誉（summa cum laude）。2010 年加入悉尼大学，获得终身教职。期间，受到多所国际顶尖大学和研究机构邀请进行访问研究和长期合作，其中包括法国巴黎路桥学院（Ecole des Ponts）和英国牛津大学（Oxford）等。研究方向包括颗粒材料和多孔介质的力学和物理问题，关注材料和细观结构的非均质，以及多相和多物理场特性。共发表国际期刊论文 170 余篇，已培养博士后、博士和硕士共 30 余人。

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