# TUAT Fluid Dynamics Seminar

# *Rheology of dense granular suspensions: from Newtonian to Bagnoldian rheology*

Lecturer:

Prof. Elisabeth Guazzelli

Date: Tuesday, 7th March, 2023

Time: 13:00 - 14:00 / Place: Building 6 - Room201

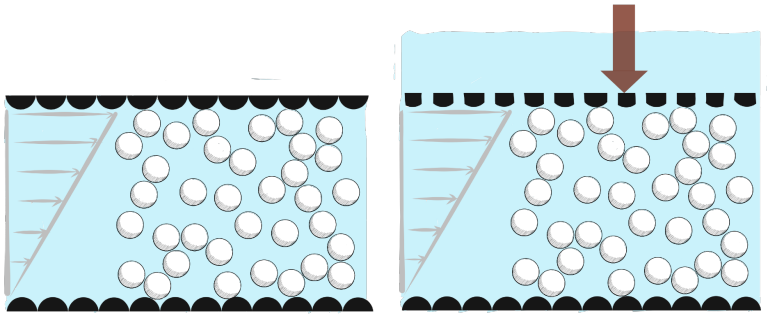
## Biography

Elisabeth Guazzelli is Senior Researcher (Directeur de Recherche) at the CNRS (Centre National de la Recherche Scientifique) and affiliated with the IUSTI Laboratory of CNRS - Aix-Marseille University. A physicist by training, her research interests are in the field of particulate multiphase flows, such as granular media, fluidized beds, suspensions, and sedimentation. She has led a very active and diversified research group in Marseille and has now moved to Paris. She is also Rector of the International Centre for Mechanical Sciences (CISM) in Udine (Italy). Since 2005, she has been an Associate Editor of the Journal of Fluid Mechanics and is presently acting as the JFM Rapids Editor. She also served in the Editorial Committee of Annual Review of Fluid Mechanics from 2011 to 2015. She was elected Fellow of the American Physical Society in 2008 and of the European Mechanics Society (EUROMECH) in 2010. She is the recipient of the EUROMECH Fluid Mechanics Prize 2016.

## Abstract

Dense granular suspensions that consist of concentrated mixtures of non-Brownian particles suspended in a liquid are ubiquitous in many natural phenomenon (e.g. landslides, debris flows, and sediment transport) and industrial processes (e.g. concrete and pastes). Their rheology is not fully understood and establishing a unified theoretical framework across the different flowing regimes is still challenging. The present work describes precise rheological measurements of granular suspensions in the dense regime utilizing a unique custom-built rheometer able to perform pressure- and volume-imposed rheometry. It addresses the transition from a Newtonian rheology in the Stokes limit to a Bagnoldian rheology when inertia is increased and examines whether the inertial and viscous regimes can be unified as a function of a single dimensionless number based on stress additivity.

This work has been done in collaboration with M. Ichihara, O. Pouliquen and F. Tapia.



Organized by: Prof.Y.Tagawa (tagawayo@cc.tuat.ac.jp)