You are cordially invited to the Mechanical Engineering Seminar:

Speaker: Professor Alban Sauret  
Department of Mechanical Engineering  
University of California, Santa Barbara  
Date: February 19, 2020  
Time: 4:00-5:00 p.m.  
Location: Bergin 116

Dry to Wet Granular Media: From Blending to Tsunami Waves Generation

Abstract:  
Modeling the flow of a dry granular material entering water is crucial for natural hazard assessment when describing the tsunami wave induced by a landslide, but also to optimize blending processes in the industry. Whereas the dynamics of a single particle crossing an air-liquid interface has been considered in the past, the collective entry of an assembly of particles remains poorly characterized. Indeed, the dynamics of the three-phases system (liquid, air, grains) is complex, particularly when exchanges are observed between the dry and wet phases.

In this talk, I will discuss our recent efforts to model the transition from a dry and dense granular flow to a wet granular medium. Experimentally, when a dense jet of grains enters from the air into a liquid bath, a stationary front appears between dry and wet grains in the liquid bath after an initial transient state. The wet grains are then dispersed in the liquid. I will discuss how to model this imbibition process in the granular jet. I will also report how the entry of dry granular media into water generates impulse waves and the implication for tsunami waves caused by landslides.

Bio:  
Alban Sauret is an Assistant Professor in the Department of Mechanical Engineering at UC Santa Barbara. He graduated with a BS and an MS in Physics from ENS Lyon (France) and earned a Ph.D. in Mechanical Engineering from the University of Aix-Marseille (France). During his graduate studies, he was awarded a Geophysical Fluid Dynamics Fellowship from the Woods Hole Oceanographic Institution. He then worked as a Postdoctoral Fellow at Princeton University and spent a few years as a CNRS Research Scientist in a joint academic and industrial laboratory. His past results were highlighted in the media, including in the Los Angeles Times, the Wall Street Journal, and Science Friday. His research aims at understanding the dynamics of multiphase systems. He is particularly interested in the couplings between the fluid dynamics, interfacial effects, and particle transport mechanisms involved in industrial and environmental processes.