The benefits of having your head in sand: some recent insights from granular materials science

Dr. Joshua Dijksman
Wageningen University

Abstract:

All materials are made from atoms. Atoms however are small, and materials are not. To make a material, atoms thus have to organize into clumps or crystals or bundles or networks. These agglomerates in turn give a material its characteristic mechanical properties, such as elasticity or fracture toughness or viscosity. When and how does an arrangement of building blocks turn into a material? Understanding exactly how mechanical properties emerge from the organization of atoms has been a centuries long quest, relevant for understanding materials ranging from diamond to toothpaste and bridges. In my talk I will present some recent developments and answers in the quest for understanding materials, in particular from studies of granular materials and elastic networks.

Short Bio: Joshua Dijksman completed his undergraduate and graduate studies at Leiden University in the Netherlands. He received his PhD degree in Dec 2009 for studies of flow properties of granular materials. From 2010 to 2014 he worked as a postdoc in the physics department of Duke University, working on mechanics of static and sheared particle packings and thin fluid films. Since Feb 2014 he is assistant professor in Wageningen University in the Netherlands, in the department of Physical Chemistry and Soft Matter. His current research interests are still in the realm of mechanics and materials, ranging from composites to friction and non-Newtonian polymeric fluids, suspensions and of course granular materials.