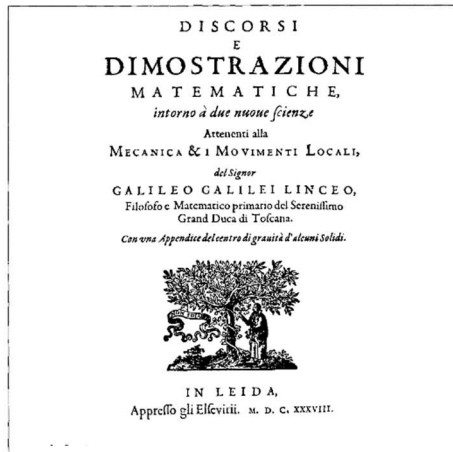


Adhesion forces at the Nanoscale - Samir Salameh

Oxide nanoparticles are synthesized, processed, and used in products at the scale of million tons per year. Based on the large surface-to-volume area nanoparticles are strongly affected by surface forces such as van der waal, electrostatics, and capillary forces.



Galileo Galilei describing the square cube law in his famous book "Two New Sciences" from 1638 (Source: Wikipedia)

This leads to the fact that nanoparticles in gases can not be handled as single particles rather as agglomerates. During my lecture I will show my research on this topic investigating the nature and impact of adhesion forces between nanoparticles in gases. The focus will be on the limits of state-of-the-art continuum theories and the necessity of considering the molecular nature at particle sizes below hundreds of nanometer. I will outline how this forces can be measured by atomic force microscopy (AFM) and the results can be compared to Molecular Dynamic simulations. Finally, I will picture a new force model which can used to describe the adhesion forces more precisely.