92st MSS-Seminar
Wednesday, May 18th, 15:30
Nägelsbachstr. 49b

MSS

Granular Media under Artificial Microgravity Conditions

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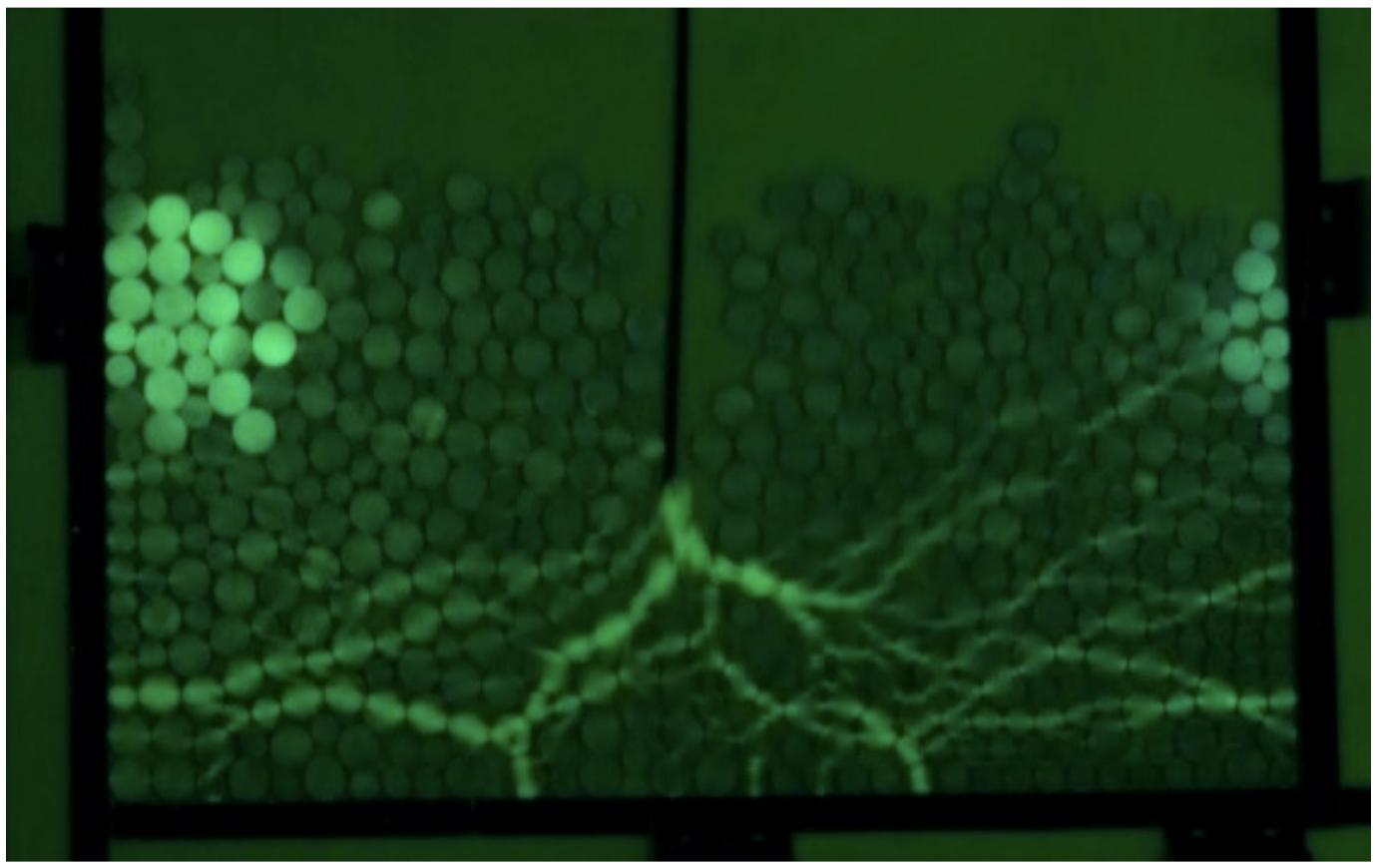

As NASA prepares to visit asteroids and other poorly-consolidated near-earth-objects (NEOs), it will be important to safely interact with the granular materials at the surface of these objects. A particular concern is the low elastic modulus of granular materials: rubble pile asteroids are only held together by weak gravitational and van der Waals forces. This means that both the escape velocity and the sound velocity are low compared to their values on earth. To better predict the dynamics of the granular flows resulting from surface explorations such as digging, sample-collection, anchoring, or lift-off, we develop microgravity experiments which are able to predict the circumstances under which the NEO material will remain intact or become unstable. In our experiments, we insert a flexible probe into a granular material under simulated conditions of low gravity. We show that low-speed interactions reduce the effects of shock wave creation and observe that thinner diggers allow the grains to rearrange and minimize the possibility of ejecta.