

ICTS Postdoc/Graduate Student Seminar Series

Title : Is there solid-on-solid contact in a sphere-wall collision in a viscous fluid?

Speaker : Sumit Kumar Birwa, ICTS-TIFR, Bangalore

Date : Friday, August 3, 2018

Time : 11:15 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : In this talk, I will show how we studied experimentally the collision between a sphere falling through a viscous fluid, and a solid plate below. It is known that there is a well-defined threshold Stokes number above which the sphere rebounds from such a collision. Our experiment tests for direct contact between the colliding bodies, and contrary to prior theoretical predictions, shows that solid-on-solid contact occurs even for Stokes numbers just above the threshold for rebounding. The dissipation is fluid-dominated, though details of the contact mechanics depend on the surface and bulk properties of the solids. Our experiments and a model calculation indicate that mechanical contact between the two colliding objects is generic and will occur for any realistic surface roughness. After this, if the time permits, I will also explain the mathematical structure of the theory I am working on.

Reference: <https://journals.aps.org/prfluids/abstract/10.1103/PhysRevFluids.3.044302>

Note: This will be an ongoing biweekly seminar series (Fridays, 11:15 am) by the ICTS postdocs and graduate students