



## SLAM Seminar

# Air mediation of compliant impact on smooth solid surfaces

**John Kolinski (EPFL)**

**Host: Scott Waitukaitis**

Before an object can contact a surface during impact, it must drain the air beneath it. For droplet impacts and soft solids, the air will fail to drain, and instead compress. Due to the low viscosity of the air, the impact process takes place over fleeting timescales and diminutive length-scales, and is typically obscured by the impacting body, making direct observation difficult or impossible. Here we use a combination of the Virtual Frame Technique and Frustrated Total Internal Reflection that enables the direct visualization of contact formation and front propagation during impact. We find that the physical properties of the fluid or material involved in the impact process, including the capillary velocity in fluid droplets and the Rayleigh velocity in elastomer impact, play a crucial role in the impact process - both the droplet and the elastomer skate on a nanometer-scale film of air during the highest velocity impacts, but only the elastomer demonstrates a transition from elasticity- to inertially-dominated impact regimes. Contact front and air film instability will be discussed for both liquid droplets and soft elastic hemispheres.

**Thursday, April 13, 2022 11:00 - 12:00**  
Big Seminar Room B (big) I23.EG / Sunstone Building



This invitation is valid as a ticket for the IST Shuttle from and to Heiligenstadt Station. Please find a schedule of the IST Shuttle on our webpage: <https://ist.ac.at/en/campus/how-to-get-here/> The IST Shuttle bus is marked IST Shuttle (#142) and has the Institute Logo printed on the side.