

**Kat Phillips**

**Drop Impact: modelling a lubrication air layer and surface waves in droplet rebound dynamics**

The phenomena of a small sphere or liquid droplet rebounding from the free surface of a deep bath has been studied experimentally and with a variety of models. It is established that an important part of the physics is a thin layer of air separating the droplet and the free surface, though current reduced models fail to fully capture the dynamics of this air layer. Assuming quasi-potential flow in the deep liquid bath regime, we are able to develop a fully coupled dynamic model for the drop-air-bath interaction, using lubrication theory to deduce the pressure transfer between the drop and free surface. In this talk, we present the development of this model in two-dimensions for both rigid and deformable impact, as well as highlight some key results from numerical simulations of the system.