

## **Variational Inequalities for Contacts with Eulerian formulations**

Olivier Pironneau LJLL/UMPC/

Eulerian variational formulations for deformable solids, with or without fluids around them, ends after implicit time discretization as a large system for the velocities in the moving domains. Handling moving domains and moving boundaries with FreeFem++ requires a careful implementation and an innovative method will be presented. On the other hand the detection of contact is particularly simple with a distance function. Then at every time step a variational inequality can be used, instead of the penalized variational formulation, to update the velocities.

A bouncing disk will be presented and also a disk hit by a club. Extension to 3D will be presented by Chiang-Chen Wu in another talk.