



Contribution ID: 370

Type: **Poster (+) Presentation**

## Lubricated hydrodynamic interactions between a hard spherical indenter and a poroelastic nanolayer

*Wednesday, 2 June 2021 16:00 (1 hour)*

Soft and porous materials are present in a variety of contexts, from pharmaceutical applications to fundamental physics of interfacial soft matter. In particular, an intermediate layer of a soft material, present between a liquid phase and a solid boundary, can induce remarkable changes in lubrication mechanics. The motion of colloidal particles above a nanoscale grafted polymer layer is just one example of this general problem. Describing the behaviour of a such a particle in this context —that is, adding the porosity of the nearby surface to the elastohydrodynamic coupling —represents a relatively unexplored field. Here, we establish theoretical models to make numerical simulations of the particle motion. Preliminary experiments of Surface Force Apparatus (SFA) on PNIPAM hydrogels samples will also be presented, and applications to Atomic Force Microscopy will be discussed. Taking care to separate various physical aspects and their contribution to the global mechanism, will help to validate the theoretical predictions. Contributions to a better understanding of colloidal motion mechanisms influenced by a porous media will be obtained.

### Time Block Preference

Time Block B (14:00-17:00 CET)

### References

LEROY, S. & CHARLAIX, E. J. of Fluid Mechanics, 2011  
JAHN, S. & KLEIN, J. Physics Today, 2018  
WANG et al. PRL, 2015  
SALEZ, T. & MAHADEVAN, L. JFM, 2015  
SAINTYVES, B. et al. PNAS, 2016  
LI, M. et al. Langmuir, 2015  
ZHANG, Z. et al. PRL, 2020

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### Student Poster Award

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**Session Classification:** Poster +

**Track Classification:** (MS16) Fluid Interactions with Thin Porous Media