FOSTERING THE PARADIGM SHIFT IN MATERIALS RESEARCH
International Conference on Programmable Materials

27 - 29 April 2020, Berlin

Symposium

Programmable surface interactions and friction

"500 years after the first studies on friction, the concepts of superlubricity, wearless sliding and friction control are being realized in laboratories and have become predictable by adequate modelling. The challenge now is to bridge the gap between what is known about these processes on the microscopic and macroscopic scales." (M. Urbakh, Nature Materials, 2010).

In situ control of friction, adaptive friction change and superlubricity have been identified as the greatest challenges in tribology. The control or influence of friction is mainly investigated on the nanoscale and not yet so intensively on the macroscale. The transferability of the mechanisms to real applications is precisely the difficulty and challenge.

This symposium aims to exchange and discuss the latest research results in the field of friction value control based on different mechanisms and methods. A special attention will be on the transferability to real applications (Fig. 1). Topics of interest within this symposium will be

- Mechanisms of controllable friction, micro-and-macroscale
- All kinds of triggers to control friction – electrical, optical, magnetic, thermal
- Experimental studies of controllable friction including surface-liquid interactions
- Modelling and simulation of surface chemical interactions and tribochemical effects
- Visions for technical applications
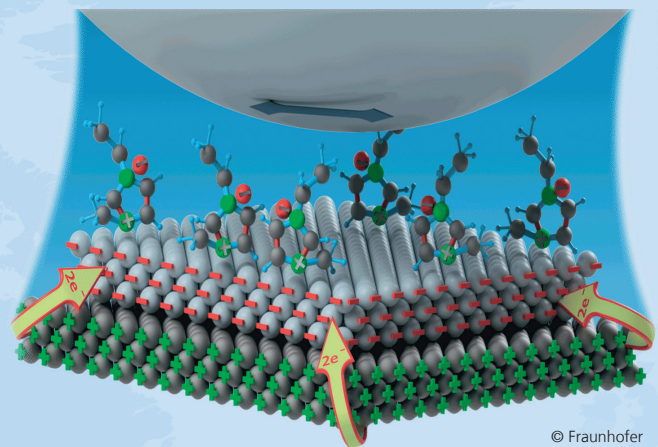
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Figure 1: Influencing the interaction of ionic liquids on a surface by electrical potentials.

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