

Research Project

Superlubricity from Macro- to Nanoscale: Bridging the gap between macro- and nanotribology

Third-party funded project

Project title Superlubricity from Macro- to Nanoscale: Bridging the gap between macro- and nanotribology

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Organisation / Research unit

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Department

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Nanoscale investigations of friction have demonstrated that superlubricity is possible. The aim is to explore how these nano-scale concepts can be transferred to the macroscale. The main focus will be on onion-like fullerene structures, which are formed by tribomechanical processes of hydrogenated carbon films. We will determine the macroscopic friction coefficients and characterize the samples with surface sensitive techniques as well as high resolution transmission electron microscopy. In order to achieve a fundamental understanding of the microscopic mechanisms of onion-like fullerene films, we will transfer individual onion-like fullerenes and explore rotational/translational degrees of freedom on the microscopic scale and test the suitability for superlubric conditions. Nanoscale investigations of friction have demonstrated that superlubricity is possible. The aim is to explore how these nano-scale concepts can be transferred to the macroscale. The main focus will be on onion-like fullerene structures, which are formed by tribomechanical processes of hydrogenated carbon films. We will determine the macroscopic friction coefficients and characterize the samples with surface sensitive techniques as well as high resolution transmission electron microscopy. In order to achieve a fundamental understanding of the microscopic mechanisms of onion-like fullerene films, we will transfer individual onion-like fullerenes and explore rotational/translational degrees of freedom on the microscopic scale and test the suitability for superlubric conditions.

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