

ESMC 2025 - Fundamentals of Friction Minisymposium 8 - 4

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The aim of this session is to give an overview on the state-of-the-art knowledge about the origins of friction and highlight the gaps in our understanding of dissipative processes from the micro- to the macro-scales. The recent developments of experimental probes and advanced numerical simulation methods, accounting for the surface properties (mechanics, chemistry and topography), brought new insights into friction mechanisms, and showed the key role of multi-scale effects, along with the necessity of their deeper investigation. Such understanding is of primal importance to design new environmentally friendly materials and surfaces to reduce friction.

Keywords: Friction fundamentals, Multi-asperity and multi-scale contact interfaces, Tribophysics and Tribochemistry, Molecular origins of friction, Superlubricity, Solid lubrication by 2D materials, Friction dynamics and instabilities.