Special Issue

Dry Friction: Theory, Analysis and Applications

Message from the Guest Editors

Although the fundamentals of dry friction were established long ago by figures such as da Vinci, Amontons, Euler, and Coulomb, as well as Bowden and Tabor, dry friction will always remain a subject of intensive research. Friction is present in virtually all physical systems, ranging from the nano- to the macroscale. Amongst the classical problems in mechanical engineering are friction-induced vibrations since they adversely affect the stable operation and performance of mechanical systems. Another serious problem is associated with cyclic microslip in the contact interfaces of any type of joints as it can cause excessive wear, resulting in surface damage and fretting fatigue failure. Friction-induced noise, on the other hand, such as automotive disk brake squeal or railway curve squeal, affects comfort. More modern applications include the use of stick–slip micro-drives as the basis for micro- and nanorobots, the deployment of friction-controlled tactile displays in surface haptics or tribotronic systems to control friction, wear and vibrations in order to improve the performance and reliability of tribological units.

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