

KEYNOTE SPEAKERS

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Fundamental Understanding of Friction at the Sliding Interface

Friction that occurs when two contacting materials move in relative motion has played a vital role throughout civilization. Particularly in the past few centuries, great minds have devoted their talents in exploring the basic behavior of friction, and much of the principles of friction as we understand it today have been introduced in those times. Though these principles apply quite well in many engineering applications, there are plenty of situations where frictional interactions do not follow the commonly accepted laws. Hence, despite the tremendous advancement in technology over the years, the ability to control friction to the desired level still remains as a great challenge. In order to overcome this hurdle, a better understanding of friction is needed. In this presentation, the fundamental behavior of friction is discussed based on multi-scale experimental and analytical studies. Specifically, the contributions of two contrasting mechanisms of friction, namely adhesion and plowing, need to be resolved to control friction in a given engineering application. Furthermore, investigating the interaction of atoms involved in the sliding interface aids in better understanding of the nature of friction. With continued effort of tribologists to clarify the elusive behavior of friction, relevant technologies are expected to advance further with better ability to control friction in various situations.