

## **Simulation Studies of Micro/Nano Tribology**

Molecular based simulations for tribology is first applied for Micro/Nano devices, such as hard disk drive in 1990s. As a member of automotive industry, we started our research to extend the applicability of the nano-scale knowledge to macroscopic phenomena. In this presentation, we show our atom based studies for the origin of solid friction, low friction mechanism of lamellar materials, molecular origin of elastohydrodynamic lubrication and boundary lubrication, always taking into account of the relation between nano and macro. Some applications for the powertrain of automobiles are also shown.

**Hitoshi Washizu** received his M.A. and Ph. D degrees in Physical Chemistry from the University of Tokyo, Japan, in 2001. He joined Toyota Central R&D Labs., Inc., from 2001. At the Tribology Lab. in TCRD, he also joined as a member of Next Generation Super Computer Project the Ministry of Education, Culture, Sports, Science & Technology in Japan. He served as a head of Washizu research group at TCRD from 2012. He took a delegate of his research group in the Elements Strategy Initiative for Catalysts and Batteries, Kyoto University. In 2015, Dr. Washizu joined as a full professor of graduate school of simulation studies, University of Hyogo. His research areas cover computational physics and chemistry of surfaces in tribology and soft materials.