



**Department of Mechanical Engineering Seminar
to be held on
Thursday, January 21, 2021, 16:00**

Zoom link:

<https://us02web.zoom.us/j/89135443578?pwd=a1RnTU1vSzM3Qy9vK2tFVEYybG13QT09>

Nanoengineering of Bioinspired Slippery Surfaces

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(Hosted by: Prof. Rafael Tadmor)

Abstract: Nature, such as plants, insects, and marine animals, uses micro/nano-textured surfaces in their components (e.g., leaves, wings, eyes, legs, and skins) for multiple purposes, such as water-repellency, anti-adhesiveness, and self-cleanness. Such multifunctional surface properties are attributed to three-dimensional surface structures with modulated surface wettability. For example, hydrophobic surface structures create a composite interface with liquid by retaining air between the structures, minimizing the contact area with liquid. Such non-wetting surface property, so-called superhydrophobicity, can offer numerous application potentials, such as hydrodynamic drag reduction, anti-biofouling, anti-corrosion, and anti-icing. Over the last couple of decades, we have witnessed a significant advancement in the understanding of surface superhydrophobicity as well as the design, fabrication, and applications of superhydrophobic coatings/surfaces/materials. In this talk, the designs, fabrications, and applications of superhydrophobic surfaces for the multifunctionalities will be presented. To overcome the issues of air depletion in the real applications of superhydrophobic surfaces, slippery liquid-infused porous surfaces, so-called SLIPS, have also recently been explored for such applications, where the water-immiscible lubricating liquid (e.g., oil) is infused into the porous structures, providing similar effects with some advantages as well as disadvantages. The designs, fabrications, and applications of such oil-impregnated nanoporous surfaces will also be presented, in comparison with superhydrophobic surfaces.

Bio: Dr. Chang-Hwan Choi is a Full Professor in the Department of Mechanical Engineering at the Stevens Institute of Technology in US. Dr. Choi received his PhD in Mechanical Engineering from the University of California at Los Angeles (UCLA) in 2006, specializing in MEMS/Nanotechnology and minoring in Fluid Mechanics and Biomedical Engineering. He earned his MS in Fluids, Thermal, and Chemical Processes from Brown University in 2002. Before he moved to US, he acquired his BS (1995) and MS (1997) in Mechanical & Aerospace Engineering from Seoul National University in Korea. He was a visiting professor at the Max Planck Institute for Polymer Research, Ecole Polytechnique Fédérale de Lausanne (EPFL), and Technische Universität Darmstadt for 2016-2017. He worked as a researcher at Korea Aerospace Research Institute for 1997-2000. He is a recipient of the 2010 Young Investigator Program (YIP) award by the US Office of Naval Research (ONR). In 2015, he was awarded the Humboldt Research Fellowship for Experienced Researchers by the Alexander von Humboldt Foundation.

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