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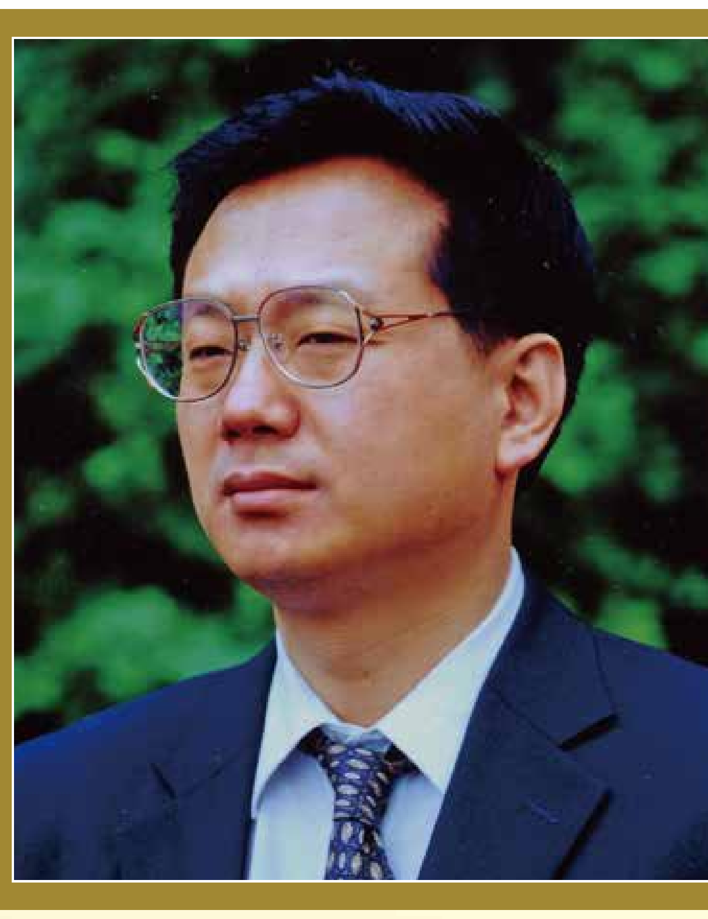

Speaker

Professor Lei Jiang

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Smart Interfacial Materials from Super-Wettability to Binary Cooperative Complementary Systems

on
Friday, 13 January 2017 at 4:30 pm
at
Room 3505, 3rd Floor
Li Dak Sum Yip Yio Chin Academic Building
City University of Hong Kong
Tat Chee Avenue, Kowloon

Abstract

Learning from nature and based on lotus leaves and fish scale, we developed super-wettability system: superhydrophobic, superoleophobic, superhydrophilic, superoleophilic surfaces in air and superoleophobic, superareophobic, superoleophilic, superareophilic surfaces under water [1]. Further, we fabricated artificial materials with smart switchable super-wettability [2], i.e., nature-inspired binary cooperative complementary nanomaterials (BCCNMs) that consisting of two components with entirely opposite physiochemical properties at the nanoscale, are presented as a novel concept for the building of promising materials [3-4].

The smart super-wettability system has great applications in various fields, such as self-cleaning glasses, water/oil separation, anti-biofouling interfaces, and water collection system [5].

The concept of BCCNMs was further extended into 1D system. Energy conversion systems that based on artificial ion channels have been fabricated [6]. Also, we discovered the spider silk's and cactus's amazing water collection and transportation capability [7], and based on these nature systems, artificial water collection fibers and oil/water separation system have been designed successfully [8].

Learning from nature, the constructed smart multiscale interfacial materials system not only has new applications, but also presents new knowledge: Super wettability based chemistry including basic chemical reactions, crystallization, nanofabrication arrays such as small molecule, polymer, nanoparticles, and so on [9].

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Biography

Professor Lei Jiang received his B.S. degree in solid state physics (1987), and M.S. degree in physical chemistry (1990) from Jilin University in China. From 1992 to 1994, he studied in the University of Tokyo in Japan as a China-Japan joint course Ph.D. student and received his Ph.D. degree from Jilin University of China with Professor Tiejin Li. He then worked as a postdoctoral fellow in Professor Akira Fujishima's group in the University of Tokyo. In 1996, he worked as researcher in Kanagawa Academy of Sciences and Technology, Professor Hashimoto's project. In 1999, he joined Institute of Chemistry, Chinese Academy of Sciences (CAS). In 2015, he moved to the Technical Institute of Physics and Chemistry, CAS. Since 2008, he also served as the dean of School of Chemistry and Environment in Beihang University. He was elected as members of the Chinese Academy of Sciences and The World Academy of Sciences in 2009 and 2012. In 2016, he also elected as a foreign member of the US National Academy of Engineering. He has published over 500 papers including 3 papers in *Nature*, 1 paper in *Science*, 1 paper in *Nature Nanotechnology*, 1 paper in *Nature Materials*, 4 papers in Natural Communication, 1 paper in *Science Advance*, 2 papers in *Chem. Rev.*, 6 papers in *Chem. Soc. Rev.*, 6 papers in *Acc. Chem. Res.*, 35 papers in *Angew. Chem. Int. Ed.*, 25 papers in *J. Am. Chem. Soc.*, and 89 papers in *Adv. Mater.*, the works have been cited more than 40000 times with an H index of 95.

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