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## **Bioinspired surfaces with gradient micro- and nanostructures to control wettability**

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**B**iological surfaces with unique wettability endow us knowledge. Since spider silk collects water in mist, taking on scene of large pearly droplets, we have revealed the mechanism of the cooperation between surface energy gradient and difference of Laplace pressure. Recently series of bioinspired fibers have been designed by the developing novel techniques at micro- and nano-level. Thus these bioinspired fibers take on unique abilities such as the capturing of extreme hanging-drop; the directional driving of tiny condensed droplets on photo or temperature responsive spindle-knots and joint; the heterostructured bead-on-string fiber for humidity response; the controlling of condensed droplets in directional transport in long range gradient spindle-knots. Learned from water repellency of butterfly wing and plant leaf, bioinspired surfaces are designed to display anti-icing, ice-phobic and de-ice abilities. The oriented or asymmetric features on geometries at micro- and nano-level can generate the driving of droplets that is resulted from the surface energy gradient, in addition to the trapped-air in multi-structures at Cassie's state. These bioinspired surfaces with micro-/nanostructures would be promising applications into wetting-controlling, water collection and ice-phobic/anti-icing.

### **Biography**

Yongmei Zheng is currently a Professor at School of Chemistry and Environment, Beihang University, China. She received her PhD (2003) from Jilin University, China. She firstly worked at Department of Applied Physics in Jilin University of Technology (1987) and then as a Post-doctoral fellow in ICCAS (2003) and as a Researcher at Centre for National Nanoscience and Technology (2005). Her research interests are focused on dynamic wetting-controlled functions of bioinspired surface materials. Her publications are included in *Nature*, *Adv. Mater.*, and *Angew. Chem. Int. Ed.*, *ACS Nano*, etc. She is a member of American Chemical Society (ACS), Chinese Chemical Society (CCS), etc.

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