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Amphiphilic Janus cylinders at fluid-fluid interfaces DAEYEON LEE, BUM JUN PARK, University of Pennsylvania, CHANG-HYUNG CHOI, CHANG-SOO LEE, Chungnam National University — We study the configuration and assembly of amphiphilic Janus cylinders at fluid-fluid interfaces at the single- and two-particle levels using experimental and theoretical approaches. We observe that high aspect ratio Janus cylinders have two configurations – upright and tilted orientation, whereas Janus cylinders with small aspect ratios adopt only the upright orientation. These configurations are confirmed by numerically calculating and minimizing the attachment energy of each Janus cylinder as a function of the orientation angle as well as the vertical displacement with respect to the interface. Unlike homogenous cylinders which show deterministic assembly behaviours at fluid-fluid interfaces, Janus cylinders exhibit a variety of assembly behaviours. We show the origin of such a diversity stems from the attractive capillary interactions between tilted Janus cylinders, which could be explained by the quasi-quadrupolar interface deformation that is caused by the wetting of the fluids on the particle surface. We will also describe our recent results involving the configuration and interactions of asymmetrically hydrophilic cylinders at an air-water interface.

Daeyeon Lee
University of Pennsylvania

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