Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Janus particles at fluid-fluid interfaces: the third face of Janus particles DAEYEON LEE, TERESA BRUGAROLAS, BUM JUN PARK, MYUNG HAN LEE, University of Pennsylvania — Janus spheres are asymmetric particles with polar and apolar hemispheres. In this work, we study the interactions and assembly of Janus spheres – bubbles and solid particles – at fluid-fluid interfaces. Both the Janus bubbles and the Janus particles have strikingly different interfacial behaviour compared to their homogeneous counterparts. Janus spheres at a fluid-fluid interface interact with each other via long-ranged attractions. We show that the attractive interactions between interface-trapped Janus spheres are induced by the presence of diffuse boundary between the two hemispheres. Three phase contact line anchored around the rugged Janus boundary deforms that the fluid interface leading to attractive interactions between the spheres. The orientation and fluid deformation caused by Janus spheres are directly observed using a gel trapping method. We also show that the surface chemistry of Janus spheres plays a critical role in determining their interfacial behaviour. Potential implications of the observed long-range attractions will be discussed.

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Date submitted: 03 Nov 2011 Electronic form version 1.4