

Abstract Submitted
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Hexagonal bubble formation and nucleation in sodium chloride solution LIFEN WANG, Argonne Natl Lab, LEI LIU, ALI MOHSIN, University of Tennessee, JIANGUO WEN, Argonne Natl Lab, GONG GU, University of Tennessee, DEAN MILLER, Argonne Natl Lab — The bubble is formed frequently at a solid-liquid interface when the surface of the solid or liquid has a tendency of accumulating molecular species due to unbalanced surface hydrophobicity attraction^{1,2}. Morphology and shape of the bubble are thought to be associated with the Laplace pressure that spherical-cap-shaped object are commonly observed³. Dynamic surface nanobubble formation and nucleation in the controlled system have been not fully investigated due to the direct visualization challenge in liquid systems. Here, utilizing in situ TEM, dynamic formation and collapse of spherical-shaped nanobubbles were observed at the water-graphene interface, while hexagonal nanobubbles grew and merged with each other at water-crystalline sodium chloride interface. Our finding demonstrates that different hydrophobic-hydrophilic interaction systems give rise to the varied morphology of surface nanobubble, leading to the fundamental understanding of the interface-interaction-governed law on the formation of surface nanobubble.

¹ Emily E. Meyer *et al.* *PNAS* **103**, 15739 (2006)

² Detlef Lohse *et al.* *Rev. Mod. Phys.* **87**, 0034 (2015)

³ Dongha Shin *et al.* *Nat. Commun.* **6**, 6068 (2015)

Lifen Wang
Argonne Natl Lab

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