

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Plenty of motion at the bottom: atomically thin, free-standing liquid gold PEKKA KOSKINEN, TOPI KORHONEN, Nanoscience center, Department of Physics, University of Jyvaskyla, Finland — Recent experiments have shown that, in addition to covalent materials, also metals like iron can display an atomically thin free-standing solid phase. This phase can be created when existing hole in free-standing graphene is patched by metal atoms. Here we investigate such a metal patch by density-functional -based molecular dynamics simulations when the patching material is gold. Simulations show that while at room temperature gold displays a solid phase, at elevated temperatures it displays an atomically thin liquid phase. This stability of free-standing gold to remain planar even upon two-dimensional diffusion is outright remarkable and has its origins in relativistic effects.

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Date submitted: 13 Nov 2014

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