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Realization of Artificial Graphene via Atomic Manipulation[1] W. MAR, K. K. GOMES, W. KO, H. C. MANOHARAN, Stanford University — Graphene has emerged as a prototype 2D material for realizing Dirac electrons in condensed matter physics. The physics of these Dirac fermions stems from the symmetries of the honeycomb lattice, naturally present in planar carbon. Here we demonstrate an artificial variant of graphene not found in nature, constructed by atomic manipulation of two-dimensional electron gases into a honeycomb lattice. We present scanning tunneling microscopy (STM) studies on artificial graphene that confirm the key electronic properties of graphene, and extend these investigations to regimes difficult to achieve in natural graphene, including atomically tunable hopping, precise defects, edges, and strain.

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Warren Mar
Stanford University

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