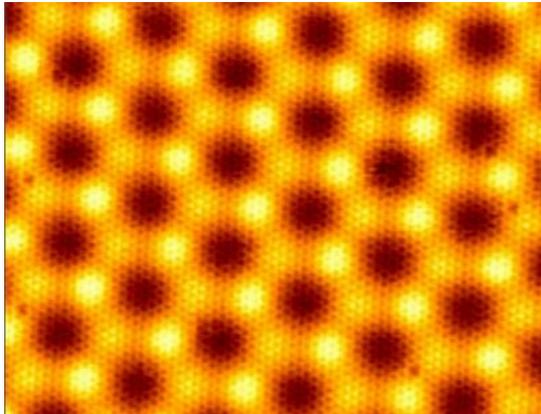


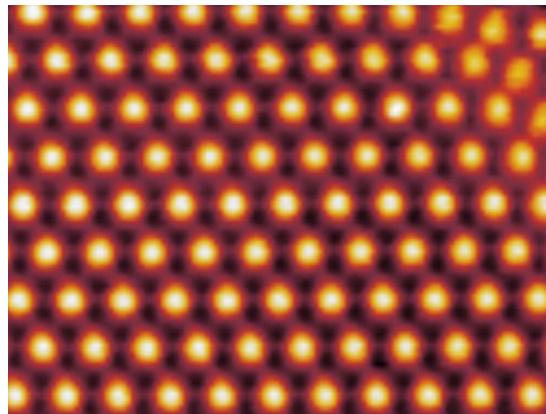
The Structure of Graphene

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Abstract: showing and giving the arrangement pattern of carbon atoms in graphene



Scanning tunneling microscopy (STM) image of Graphene on Ir (111). [2]



The surface of a trilayer of graphene, as imaged by scanning tunneling microscope. Due to the twist of a second layer, trilayer height is modulated with a period of about 9 nanometers. Credit: California Institute of Technology[3]

Graphene is an allotrope of carbons in the form of a two-dimensional, is a single layer of atomic plane of graphite, atomic-scale, hexagonal lattices in which one atom form each vertex. It is the basic structural element of other allotropes, including graphite, charcoal, carbon nanotubes and fullerenes. It can also be considered as an indefinitely large aromatic molecule, limiting case of the family of flat polycyclic aromatic hydrocarbon. [1]

According to the images [2] & [3] that which is in clearly and intuitively, Graphene is a crystalline allotrope of carbon with two-dimensional properties, its carbon atoms are densely packed in a regular atomic-scale sturdy girder (equilateral triangle) pattern. from the images and them shows to us, the big black spots in [2] and big yellow spots in [3] are noble gas notations; the pale yellow highlight spots in [2] and the big black spots in [3] are electron holes; the orange link grids are atomic bonds; the orange rings of the noble gas notations are the inner-layer extranuclear charges that not directly involved in the atomic bonds. Each atom, at least $1/2$ or more of the extranuclear charges is divided into six equal parts, and formed into the same and uniform atomic bonds with six adjacent carbon atoms. In shot, Graphene is a monolayer grid of carbon atoms(like a barbed wire fence) by which carbon atoms from atomic bonds with neighboring carbon atoms through their own outer electrons.

References & Related stories

[1] Graphene <https://en.wikipedia.org/wiki/Graphene>

[2] Strong inside, weak outside: Graphene on Ir (111)

https://www.esrf.fr/news/spotlight/spotlight144/index_html

[3] Hyunjin Kim et al, Evidence for unconventional superconductivity in

twisted trilayer graphene, Nature (2022). DOI: [10.1038/s41586-022-04715-z](https://doi.org/10.1038/s41586-022-04715-z)