The Structure of Graphene

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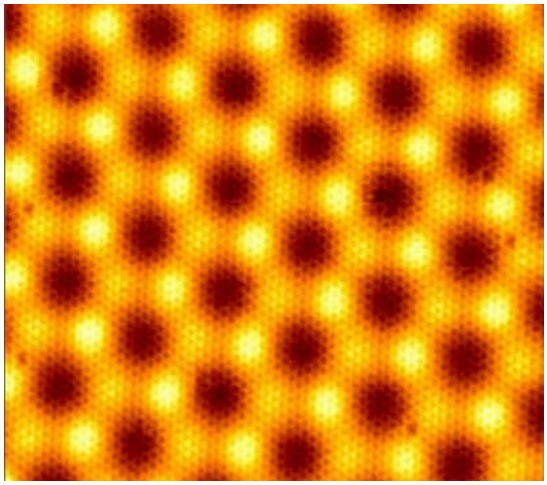
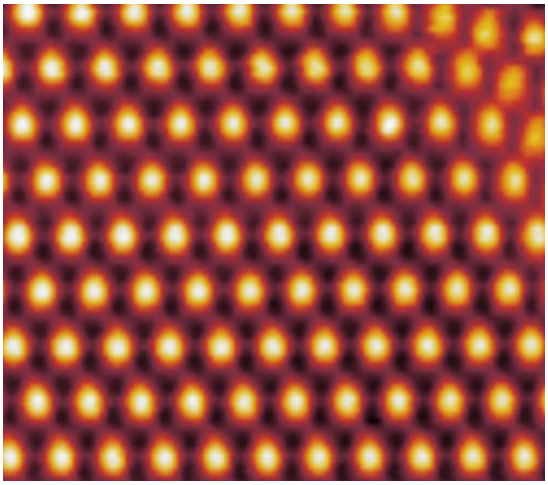
Abstract: giving the arrangement pattern of carbon atoms in Graphene



Scanning tunnelling microscopy (STM) image of Graphene on IR (111). [2]



The surface of a trilayer of graphene, as imaged by scanni 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]

Viewpoints and Conclusions:

Graphene is an allotrope of carbon in the form of a two-dimensional, a single 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, the limiting case of the family of flat polycyclic aromatic hydrocarbons. [1]

According to the image[2] with clearly and intuitively, Graphene is a crystalline allotrope of carbon with 2-dimensional properties. Its carbon atoms are densely packed in a regular atomic-scale sturdy girder (equilateral triangle) pattern. Big black spots are noble gas notations; pale yellow highlights are electron holes; 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 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.

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*