Tata Institute of Fundamental Research

PUBLIC LECTURE

Graphene with a twist: Moire superlattices in two dimensional crystals

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5:30 PM

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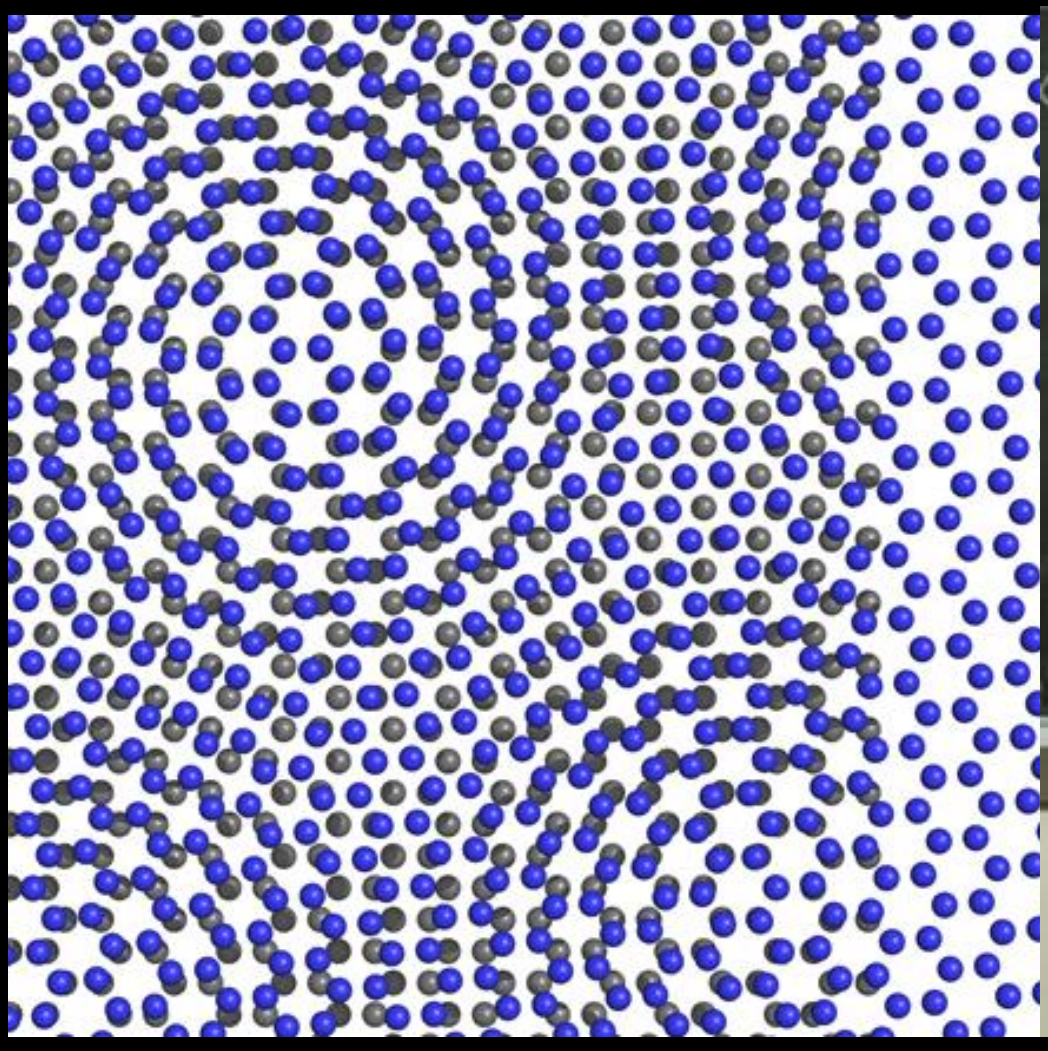

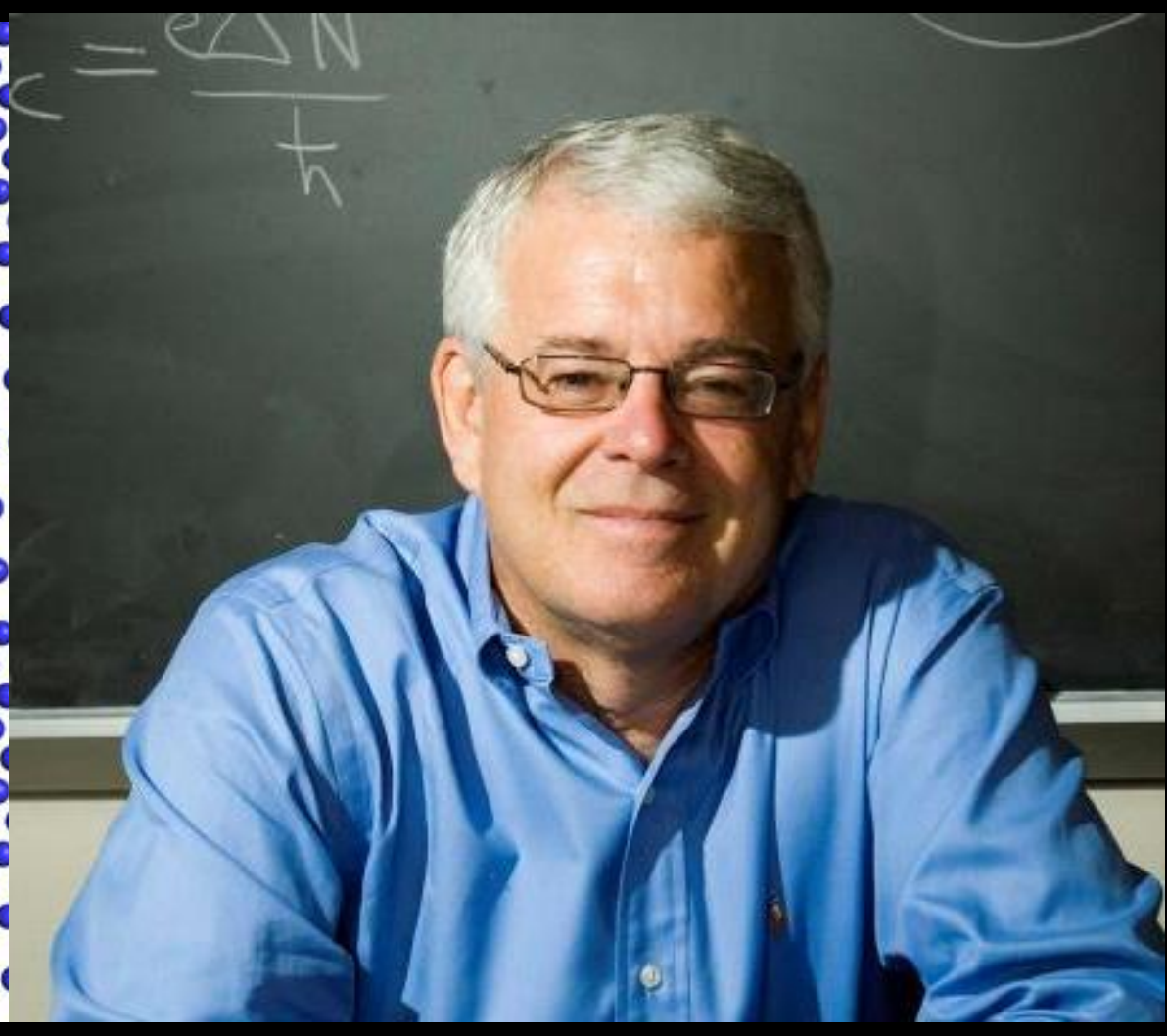

Moiré patterns are ubiquitous in layered van der Waals materials, and can now be fabricated with considerable control by combining mechanical exfoliation of van der Waals layers with tear and stack device fabrication techniques. I will explain why the electronic and optical properties of two-dimensional semiconductors and semimetals are strongly altered in long-period moiré superlattices, focusing in particular on the remarkable example of twisted bilayer graphene. When twisted to a magic [1] relative orientation angle near 1 degree the moiré superlattice minibands of bilayer graphene become extremely narrow and electronic correlations become strong.

[1] Moire bands in twisted double-layer graphene, R. Bistritzer and A.H. MacDonald, PNAS 108, 12233 (2011).

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