

National Nanotechnology Coordinated Nanostructure Infrastructure

2019 NNCI Annual Conference

Center for Nanoscale Systems at
Harvard University

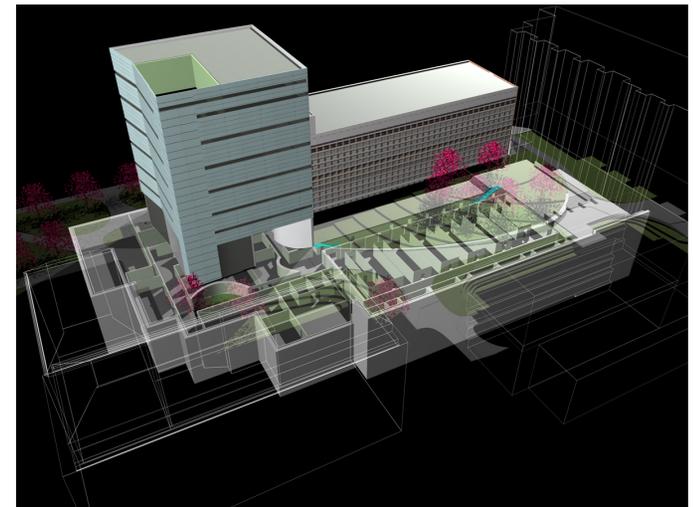


Center for
Nanoscale
Systems
Harvard University
FAS • SEAS

Center for Nanoscale Systems (CNS) at Harvard

History

- 1999 Dean Jeremy Knowles – Funds new research centers in science
- 2000 Our Center is created
- 2004 National Nanotechnology Infrastructure Network (NNIN)
- 2007 Laboratory for Integrated Science & Engineering (LISE)
- 2015 National Nanotechnology Coordinated Infrastructure (NNCI)



LISE Building showing CNS below ground



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Vision

Create a collaborative multi-disciplinary research environment to support of the creation and evolution of world-class nanoscience with advanced shared facilities and technical expertise.

Core Values

Facilitate leading-edge, multi-disciplinary, research and education for the fabrication, imaging, and characterization of nanoscale structures, across the disciplines of applied physics, biology, chemistry, engineering, geology, materials science, medicine and physics.

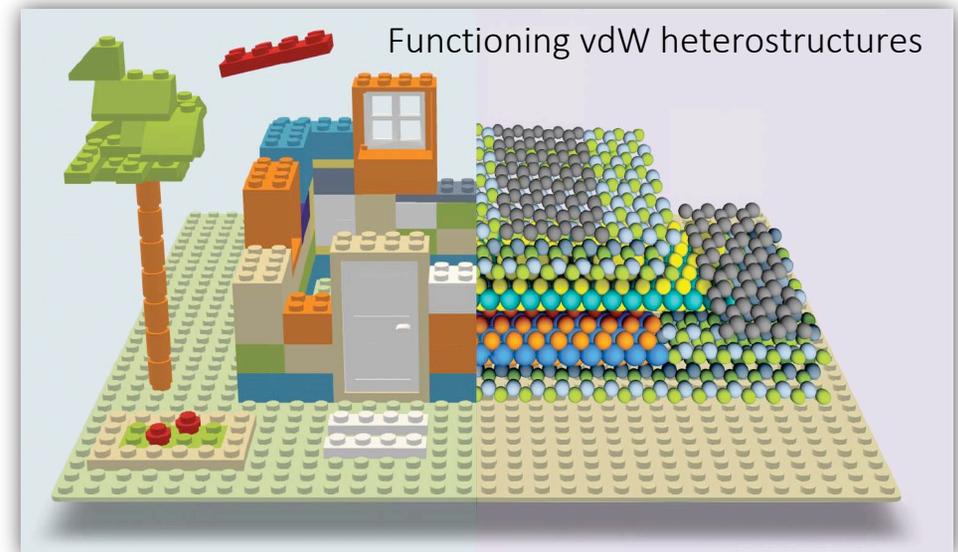
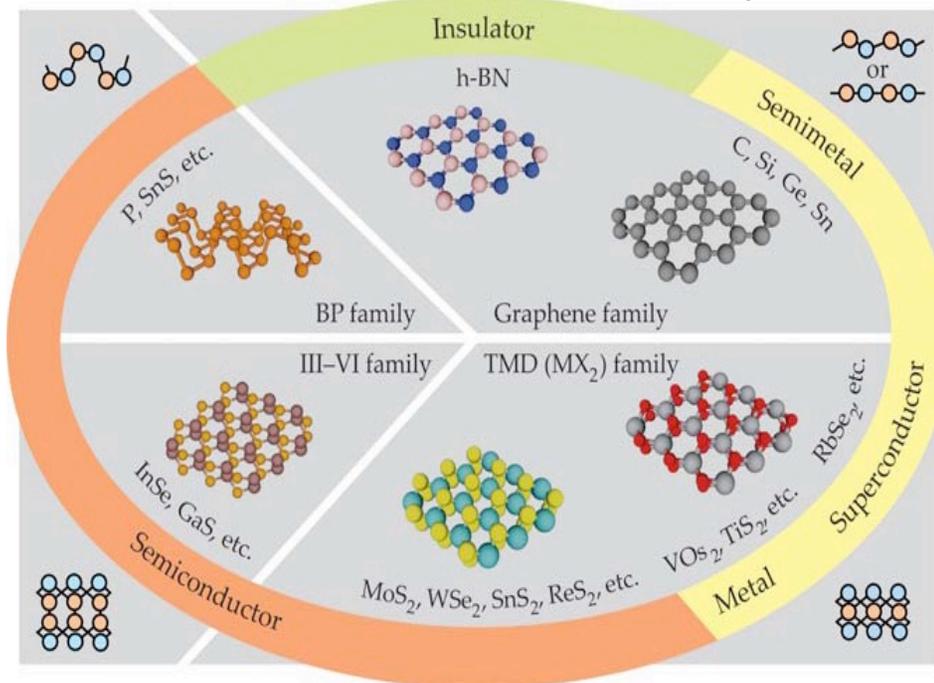
Create a leading collaborative nanotechnology research community by providing shared instrumentation facilities and infrastructure, expert staff, synergistic meeting places, and educational opportunities conducive to productive scientific engagement.



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Atomic scale heterostructures of 2D materials

2D van der Waals Materials Family

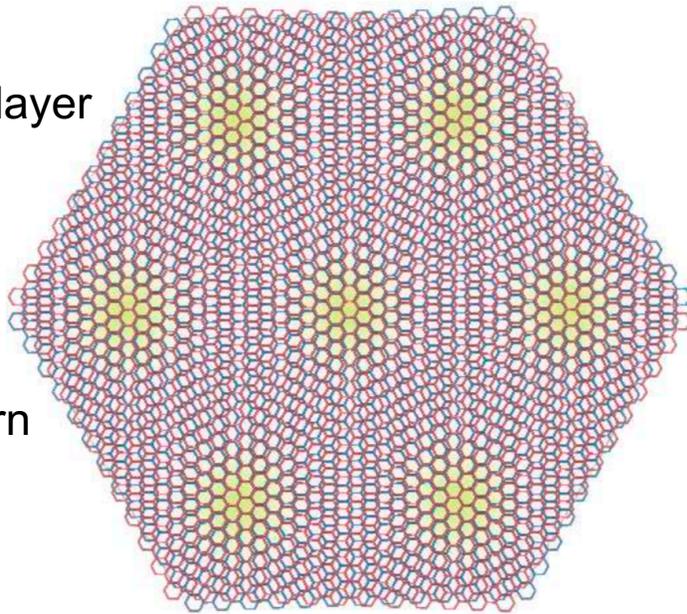


- Semiconductors
- Insulators
- Metals
- Semimetals
- Superconductors

Robotic assembly of atomic scale heterostructures into new types of quantum materials

Twistronics – Superconducting carbon

twisted
graphene bilayer

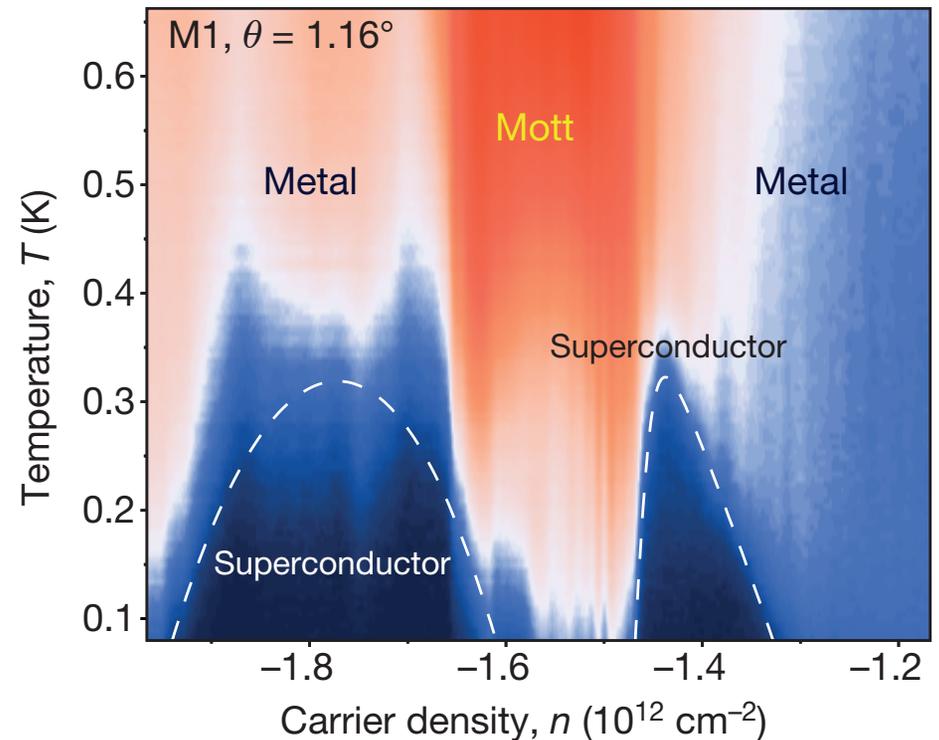


Moire pattern

Bilayer graphene

Twisted by the magic angle 1.1°

Flat energy bands – ee correlations



Superconductor / Mott insulator
Similar to high-T_c superconductivity

Cao *et al* Nature **556**, 43 (2018)

Thank you!

