

National Nanotechnology Coordinated Nanostructure Infrastructure

2019 NNCI Annual Conference

Center for Nanoscale Systems at
Harvard University

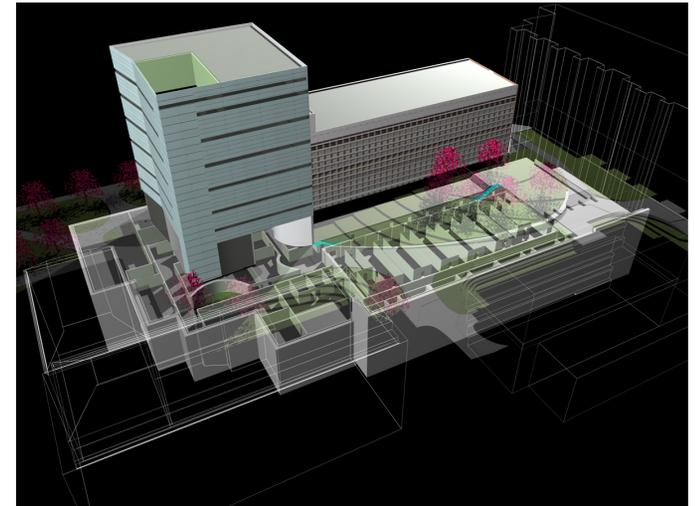


Center for
Nanoscale
Systems
Harvard University
FAS • SEAS

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



Center for
Nanoscale
Systems
Harvard University
FAS • SEAS

Center for Nanoscale Systems (CNS) at Harvard

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.

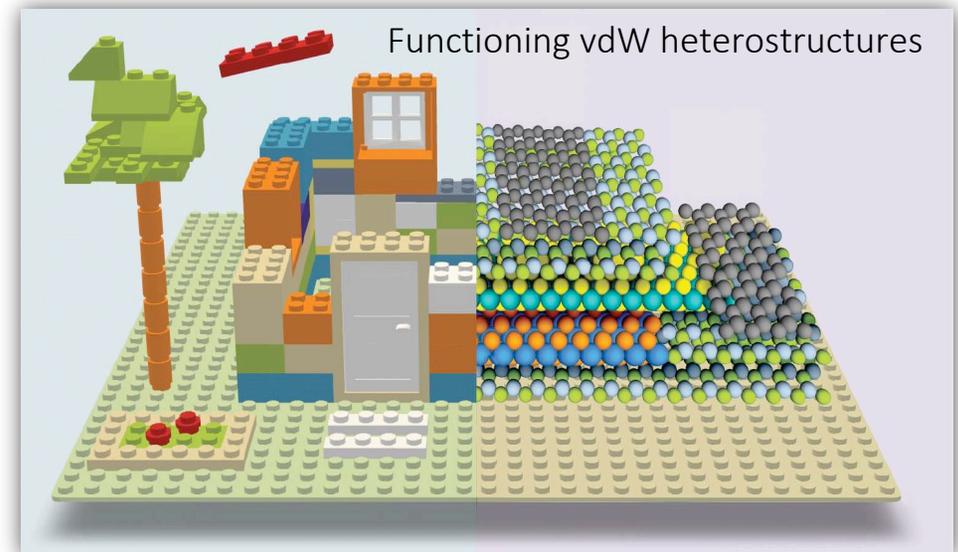
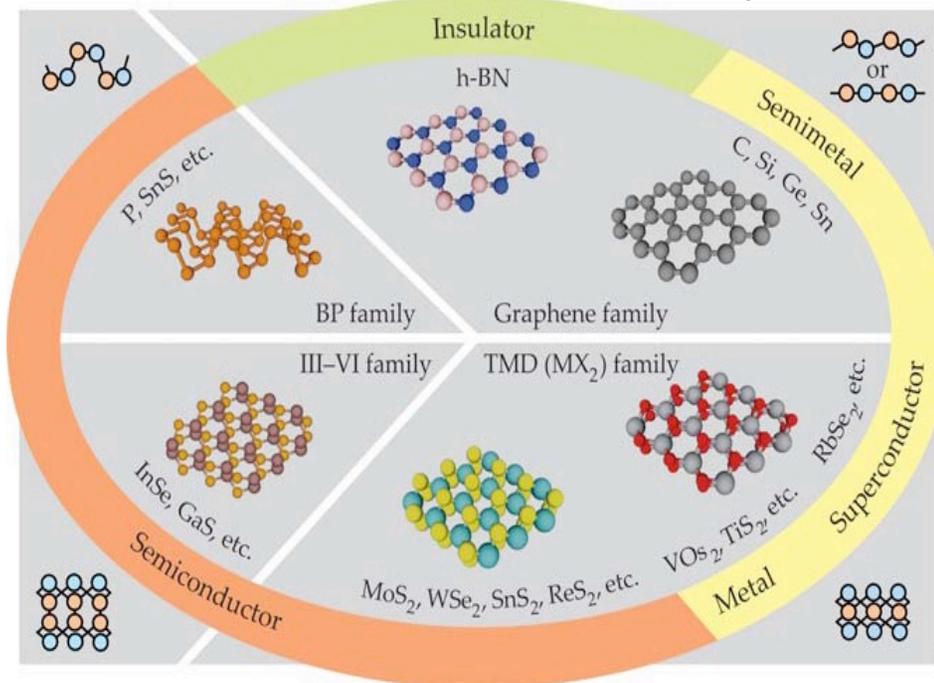
Create a leading collaborative nanotechnology research community by providing shared instrumentation facilities and infrastructure, expert staff, synergistic meeting places, and educational opportunities conducive to productive scientific engagement.



Center for
Nanoscale
Systems
Harvard University
FAS • SEAS

Atomic scale heterostructures of 2D materials

2D van der Waals Materials Family

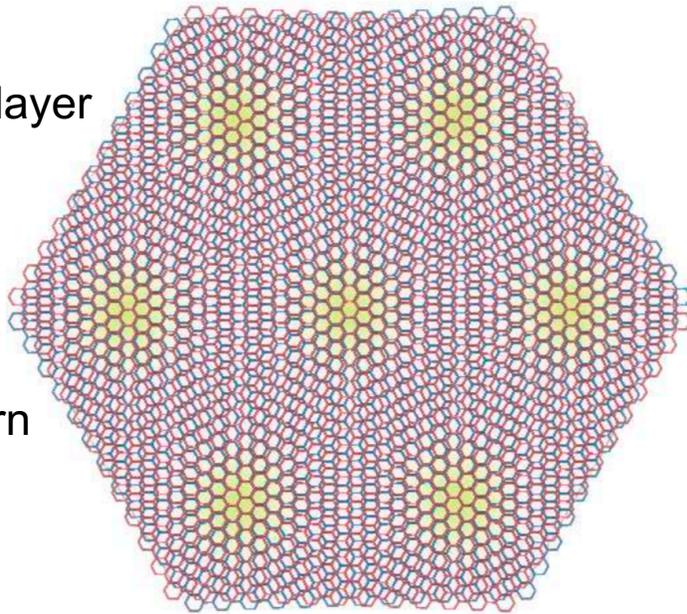


Robotic assembly of atomic scale heterostructures into new types of quantum materials

- Semiconductors
- Insulators
- Metals
- Semimetals
- Superconductors

Twistronics – Superconducting carbon

twisted
graphene bilayer

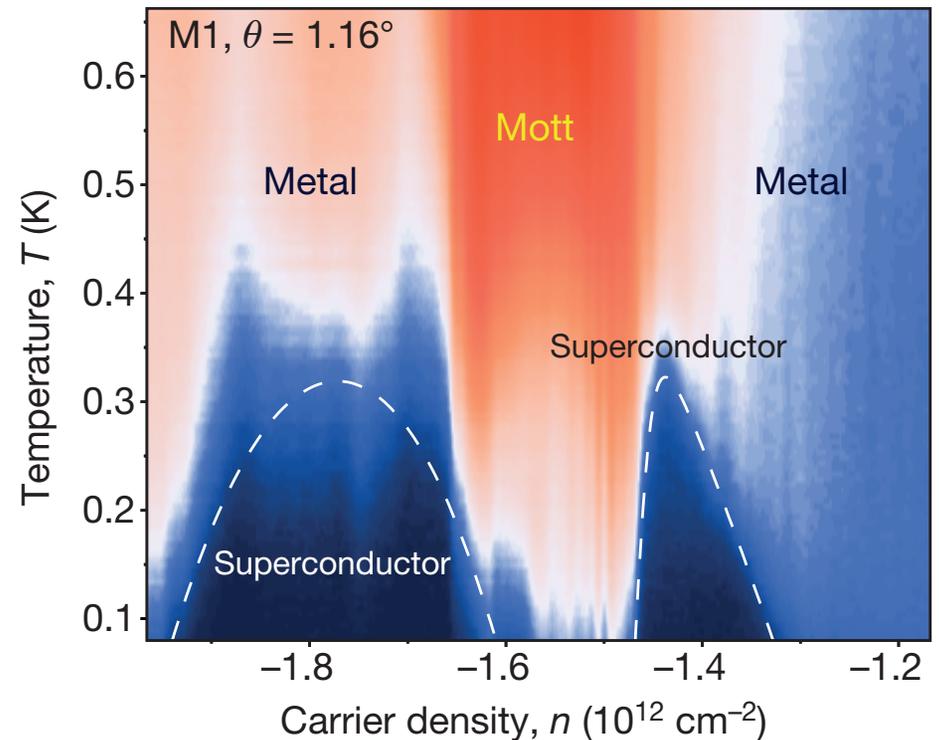


Moire pattern

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!

