

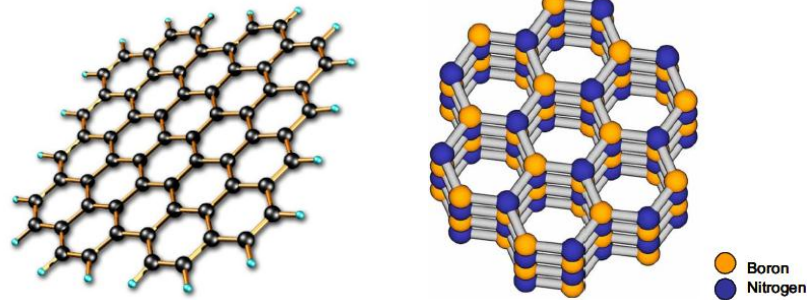
Development of New Anisotropic Materials for Thermal Management Applications

Matthew Charlton

Motivation: Reduce the thermal energy loss experienced in thermal management systems

Research Goals: Produce two dimensional (sheet-like) materials which exhibit highly anisotropic thermal properties

- Graphene
- Hexagonal Boron Nitride (h-BN)



Advantageous Properties:

- High thermal conductivity across the sheets with almost zero conductivity between the sheets – control of heat flow
- Good chemical and thermal stability – can be used in applications with hostile environments

Challenge:

- Many properties of these materials are dependent on good crystal continuity
- Growth of large areas of these materials for production has yet to be demonstrated