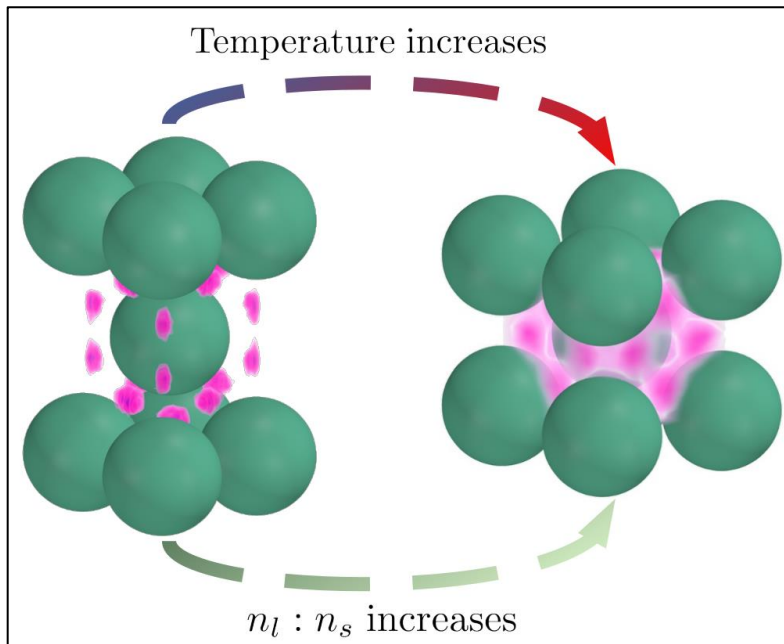


Metallization of Colloidal Crystals



Transition between localized and delocalized sublattices can be accompanied by a change in overall crystal type. This all depends on the temperature and composition (number ratio of large to small particles) of the crystal.

Work was performed at Northwestern University

Ehlen, A.*; Lopez-Rios, H.*; Olvera de la Cruz, M.
Metallization of Colloidal Crystals. *Phys. Rev. Mater.* 2021, 5 (11), 115601.

*Equal contributions

Scientific Achievement

Simulations revealed details of sublattice delocalization of colloidal crystals, which can resemble certain insulator-metal transitions.

Significance and Impact

This work furthers the analogy between atomic and colloidal crystals. This may lead to a better understanding of the atomic transitions, as well as improved tunability of colloidal crystals.

Research Details

- The type of sublattice delocalization is determined by the crystal composition ($n_s:n_l$)
- Varying $n_s:n_l$ can lead to observations of first-order phase transitions or smooth changes to sublattice delocalization
- Lattice vibrations are essential for sublattice delocalization



U.S. DEPARTMENT OF
ENERGY

Office of
Science



Center for Bio-Inspired Energy Science