The Nobel Prize in Physics was awarded in 2016 for the discovery of topological phases of matter. We recently showed, employing classical atomistic calculations, that the edges of a chiral supramolecular nanoribbon can host topological edge phonon states (Figure 1 and J. Phys. Chem. Lett., 10, 19, 5830-5835, 2019). In this project, you will establish your online database, employ molecular dynamics (MD) and STM at the solid-liquid interface, to study various molecular architecture patterns which can host topological phonon bands, toward supramolecular thermal waveguides, thermal diodes, and thermal logics.

Figure 1. a Chiral phonon map in a supramolecular ribbon b Simulated excitation of a chiral phonon c Available experimental systems

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