Advanced Lab / Master Thesis

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Phonon topology in molecular architectures

Keywords: AFM, STM, Raman, MD, **DFTB**, **Phonotopy**

Update: Online Advanced Lab & remote supervision option available

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.

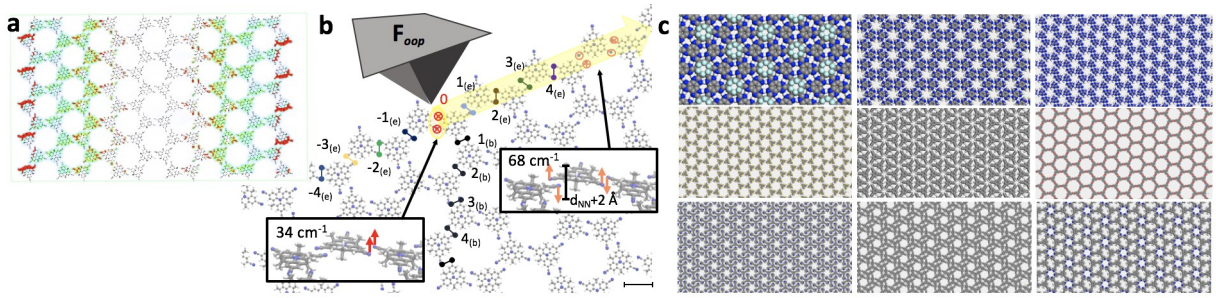

Figure 1. a Chiral phonon map in a supramolecular ribbon **b** Simulated excitation of a chiral phonon **c** Available experimental systems

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