“In-plane thermal transport in suspended silicon and graphene isotope superlattices”

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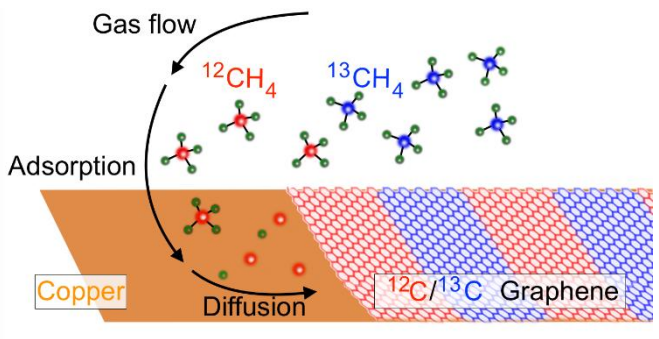

Many thermoelectric applications require reduced thermal conductivities but with enhanced electrical conduction. This can be achieved by creating phonon barriers using isotope engineering. Here we synthesized lateral isotope superlattices using different carbon isotopes in single layer graphene and demonstrate a strong reduction of thermal conductivity with inverse isotope periodicity, down to several nanometers [1,2]. We further demonstrate new techniques to spatially resolve thermal properties in suspended membranes at low temperatures.

[1] E. Whiteway et al., *Physical Review B* 102.23 (2020): 235429.
[2] E. Whiteway et al., *ACS Applied Nano Materials* 3.9 (2020): 9167.