

## **Two-dimensional emptiness and its unique properties**

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I shall overview our recent work on atomic-scale cavities fabricated by van der Waals assembly of two-dimensional crystals. These ultimately narrow cavities can be viewed as if an individual atomic plane is extracted from a bulk crystal leaving behind a 2D empty space, essentially an angstrom-scale gap connecting two edge dislocations. Gas, liquid, ion and proton transport has been studied using such 2D cavities down to one atom in height, revealing interesting and sometimes counterintuitive phenomena.