

# Towards the molecular-scale van der Waals capillaries and their applications in nanofluidics

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Isolated two-dimensional (2D) crystals can be assembled into designer structures layer-by-layer in a precisely chosen sequence – van der Waals (vdW) technology. Using this method, we have demonstrated the creation of two-dimensional capillaries by assembling 2D crystals. It can be viewed as if individual atomic planes were pulled out of a bulk crystal leaving an atomically thin void behind. This technology offers the smallest possible empty spaces that can vary from just a few angstroms in height up to many nanometers on demand. On this basis, we investigated mass transport process, including ions transport and the peculiar properties of water under such strong confinement. I will talk about our latest progress on capillary condensation at the atomic scale, and nanoconfinement effects study based on such capillaries.