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Fabricating van der Waals heterostructures

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The isolation of single layer graphene in 2004 by Geim and Novoselov introduced a technique that researchers could extend to the broad family of van der Waals materials. Just as the van der Waals bonds responsible for holding together adjacent layers of two-dimensional (2D) materials can be broken, they can also be put back together. Crystals can then be reassembled with layers from different compounds or in different stacking orientations to create new materials previously inexistent in nature. In this work, we describe a home-built transfer setup that allows the user to create these new crystals (van der Waals heterostructures) by stacking distinct layered 2D materials with lateral alignment and, importantly, angular alignment. In addition to presenting the transfer set-up, we also describe some techniques for preparing the crystals that are subsequently stacked. Finally, characterization of the heterostructures is presented.

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