

Synthesis and applications of 2D materials and van der Waals heterostructures

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The van der Waals (vdW) heterostructures are generally made from stacks of atomically thin two-dimensional (2D) materials, allowing the creation of new materials with tailored properties strongly dependent on the constituent 2D materials and the physical interactions between these layers. They have attracted considerable attention due to their exotic physical properties and intriguing device performance, often beyond those in their constituent 2D materials. In the presentation, I will highlight selected state-of-the-art approaches for synthesizing vdW heterostructures and the latest trends in the development directions and applications of two-dimensional materials in the areas of electronics, photonics, and phononics. In addition, I will briefly discuss WUT's technological capabilities in the synthesis and devices fabrication of electronic devices.