

Materials Science with 2D Atomic Layers

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There has been tremendous interest in recent years to discover, explore and demonstrate unique properties and applications of 2D materials. This got started with the spectacular discovery of graphene. This talk will focus on the materials science of 2D atomic layers and their hybrid architectures. Several aspects that include synthesis, characterization and manipulation will be discussed with the objective of achieving functional structures based on 2D atomic layers. The concept of artificially stacked van der Waals solids, atomically thin planar heterojunctions, and 2D layers based 3D constructs will be discussed using a number of examples consisting of graphene and other 2D layer compositions. Specifically, the talk will discuss multicomponent 2D alloys and artificially stacked hybrid van der Waals architectures. The talk will explore the emerging landscape of 2D materials systems that include graphene, boron-nitrogen-carbon systems, and a large number of transition metal dichalcogenide compositions.