

Playing Lego with 2D materials

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Even since the Mayans first used clays to make dyes, mankind has studied and made use of layered materials. Currently we live in an era of enormous interest in the manipulation of two-dimensional materials following the discovery of the marvelous properties of graphene. In this talk I shall illustrate various aspects of production of 2D solids and discuss their properties. Then I shall pass on to pillared structures achieved by intercalation of molecules between the 2D layers and stacked bilayer structures. Fascinating fundamental discoveries concerning the electronic states in single and stacked layers will be discussed as well as the use of pillared materials for gas storage, catalytic and biomedical applications.