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Mollifying Barriers to Enhance Self Assembly

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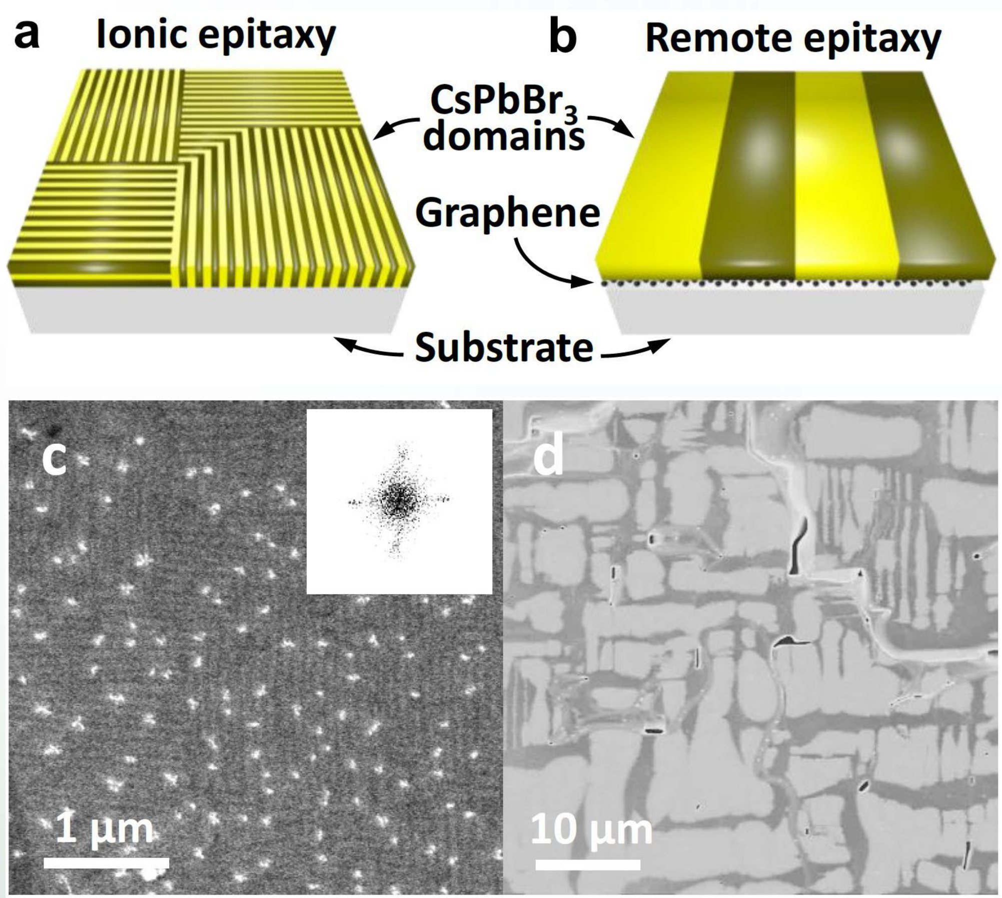
Defects in the structure of a material, such as missing atoms or boundaries between grains oriented in different directions, may drastically inhibit the flow of electric currents through the material. The situation gets more complicated if a thin film of the material is needed and there are no large-area substrates that could act as suitable template to align all of the grains. For example, the depositing atoms may bond so strongly with the substrate that they cannot move around to make room for each other, or a weakly interacting substrate might not aid the alignment of the depositing atoms and they clump into grains that are misoriented from one another as well.

Jiang *et al.* study the growth and properties of thin films of $CsPbBr_3$—a novel semiconductor material for solar cell applications. They find that lining a substrate that normally bonds too strongly with an atomically-thin layer of graphene weakens the bonding sufficiently for thin films to be grown with good alignment, larger grains, fewer defects, and significantly enhanced charge transport properties.

PARADIM provided access to high-resolution transmission electron microscopy to unravel the details of the interface between the substrate, graphene, and the thin film semiconductor.



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