

# ISGD-5

5<sup>th</sup> INTERNATIONAL SYMPOSIUM ON GRAPHENE DEVICES

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## **2D Adventures: From Graphene to Phosphorene to Silicene, Progress and Commercialization**

2D nanomaterials are ideally suited for nanoelectronics owing to their combined troika of properties involving high mobility and electrostatic control, high thermal conductivity, mechanical strength, optical transparency, and large surface to volume ratio all of which derive from their atomically thin profile. We discuss the progress on graphene which has been the most studied of the 2D materials and offers the highest mobility. Despite the lack of a bandgap, flexible high-frequency electronics and circuits have been demonstrated, and high-quality monolayer growth on 300mm wafers achieved. In addition, new results on phosphorene indicate it might be very attractive for both digital and analog RF functions due to its tunable direct bandgap and high mobility beyond TMDs. Furthermore, we report on the first realization of transistors made from silicene, the 2D silicon equivalent of graphene, and the prospect for quantum transistors based on symmetry protected topological insulating edge states. Finally, commercialization of graphene in mobile electronic systems is described.