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### **Interlayer Physics in Few Layer Graphenes<sup>1</sup>**

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Few layer graphenes (FLG's) represent a family of materials with physical properties distinct from those of single layer graphene and bulk graphite. Their electronic behavior is determined by the nature of electronic motion between layers and by the interactions of electrons in different layers. This talk reviews our experimental and theoretical work studying aspects of nanoparticle growth on FLG's that are determined by this interlayer physics. We observe and analyze: (1) a systematic film thickness dependence of the surface potential for FLG's deposited on SiO<sub>2</sub> substrates, (2) a related thickness dependence of the sizes of gold nanoparticles that nucleate on the exposed surface of FLG's and (3) a shape instability for growing nanoparticles formed from low workfunction metals adsorbed on FLG's. Finally we discuss some novel aspects of the interlayer electronic motion that are controlled by the rotational registry of neighboring layers.

<sup>1</sup>Work done in collaboration with: Y. Dan, S.S. Datta, A.T. Johnson, N.J. Kybert, Z. Luo, T. Ly, L.A. Somers, D.R. Strachan and N. Zimbovskaya.