

### Novel Graphene Devices

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Graphene, as the semiconductor *du jour*, presents interesting opportunities but also faces unique challenges for applications in nanoelectronics. As a gapless semiconductor, with an inert surface that is difficult to grow high quality gate dielectrics on, or chemically dope, it can be challenging to make graphene field effect transistors (GFETs) with low leakage currents, low interface state densities, and low source/drain series resistance. However, the Dirac cone bandstructures with high Fermi velocities enable high frequency GFETs with ambipolar characteristics which can be used, for instance, in simple frequency doublers. Beyond-CMOS low power device ideas include single particle 2D-2D interlayer tunnel FETs (ITFETs), or more esoteric many-body tunneling devices such as the Bilayer Pseudospin FET (BiSFET). In this talk, we will discuss recent results of GFETs, as well as the challenges of making ITFETs and BiSFETs.