Advances in graphene growth and device processing have enabled a host of advanced device concepts. We will describe field effect transistors (FETs) and beyond-CMOS ideas such as tunnel FETs which show negative differential resistance (NDR) that are enabled by the unique properties of graphene [1-2]. We will discuss applications of such devices in memory and logic circuits. Challenges in large scale integration of such devices and commercialization will be discussed.

References:


**Figure 1:** Bi-layer graphene-hBN tunnel FET showing negative differential resistance (NDR).

**Figure 2:** Use of NDR in 1-transistor static random access memory circuit. Conventional CMOS SRAMs require 4 transistors.