Graphene Electronics and Optoelectronics

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Graphene has outstanding electrical transport and optical properties. These properties are, therefore, the focus of intense efforts for their use in electronic and optoelectronic device technologies. In my talk I will discuss some of these key properties and their possible technological applications.

In electronics, I will focus on applications involving high frequency (>1000 GHz) graphene transistors and simple ICs along with related device physics issues, such as the role of electrical contacts, scattering effects, graphene topology, device size scaling, gain, etc.

I will also review the key optical and plasmonic properties of graphene. I will discuss the mechanisms of photocurrent generation in graphene and the use of graphene and graphene micro- and nano-structures in ultrafast graphene photodetectors and other optoelectronic devices in the mid-IR, far IR and THz ranges of the spectrum.