

Graphene plasmon has attracted great attention as a viable tool for fast electrical manipulation of light. The prospects for applications to electro-optical modulation, optical sensing, quantum plasmonics, and light harvesting are further stimulated by the relatively low level of losses and high degree of spatial confinement that characterize these excitations compared with conventional plasmonic materials, alongside the large nonlinear response of graphene. In this talk, first, graphene properties, when it is interacting with electromagnetic waves, are considered. Then, the plasmonic guided mode of infinite graphene sheet and its characteristics is introduced. I also present various graphene-based waveguides. The next section in this talk is devoted to the study of localized plasmonic modes on graphene ribbons and discs. Finally, applications of graphene plasmonics and graphene-based optical devices will be discussed.