

Optics in Graphene and other 2D Materials

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Content:

Graphene, the two-dimensional crystal of carbon, yields a tunable platform to control light-matter interaction in a very broad spectrum ranging from visible to microwave frequency. Atomic thickness together with the tunable high mobility Dirac electrons on graphene has attracted great interest in the graphene community in order to realize novel optoelectronic devices. Although graphene is one-atom thick, due to interband and intraband electronic transitions it can yield profound optical absorption from visible to microwave frequencies.

In this course, I will discuss the fundamental aspects of optics in graphene. In the second part, we will discuss on their applications for optoelectric devices. Although graphene is probably the best known 2D material relevant to photonics, the third part of the lecture will cover other atomically thin materials for photonic applications.