

# Electrons and photons in two-dimensional quantum world

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Electrons and photons in two-dimensional quantum materials have interesting properties that may find applications in new electronics and photonics. For example, electrons in two-dimensional hexagonal structures such as graphene possess the valley degree of freedom, in addition to charge and spin, which has triggered recent efforts to develop new valleytronic devices with vast tunability and fast speed [1-3]. More recently, photons generated from two-dimensional material-based color centers are discovered to be quantum light that will be useful for quantum communication and computation technologies [4]. In this talk, we will introduce recent progress on electronics and photonics using two-dimensional materials for the advancement of the future applications and technologies.

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