

Abstract Submitted
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Formation of Phonoritons in Organic-Semiconductor Heterostructures QUE HUONG NGUYEN, Marshall University — We theoretically study the formation of polaritons and phonoritons in hybridization structure of a quantum dot system embedded in an organic material. The Frenkel exciton in the organic material is coupling with the Wannier Mott exciton in semiconductor quantum dots when the two excitons are in resonance to form an organic-inorganic hybrid exciton. While a new kind of polariton is formed by coupling of hybrid exciton with photon, a strong laser pump could lead to the coupling of the polariton with phonon field to form phonoriton, a new quasiparticle as a coherent superposition of exciton, photon and phonon. As the Frenkel and Wannier excitons have complimentary properties in interaction with photon and phonon fields, the hybridization of these two components will enhance phonoriton formation.

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