Quantum Electrodynamics of graphene Landau levels in a deep-subwavelength hyperbolic phonon polariton cavity

SPEAKER:

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Confining light in a small volume is a promising strategy to enhance light-matter interactions to a degree where zero-point quantum vacuum fluctuations of the electromagnetic field can control a material's properties. Here, we develop a theory of the quantum electrodynamics of graphene Landau levels embedded in a deep-subwavelength hyperbolic cavity, where light is confined below the diffraction limit. By studying the spectrum, we discuss the emergence of polaritons and distinguish between the influence of resonant quantum vacuum effects and purely electrostatic terms. Finally, we study the hybridization of the magnetoplasmon with the cavity modes.

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