

Non-Gaussian quantum optics and optomechanics

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The talk will present recent achievements in quantum optics with non-Gaussian states of light and their applications in quantum communication and quantum optomechanics: (i) novel hierarchy of criteria of quantum non-Gaussianity for multiphoton states of light, (ii) first experimental verification of this criteria using parametric down conversion source, (iii) analysis of quantum non-Gaussian states of photons transferred to phonons and back to photons in optomechanical and electromechanical oscillators. We will conclude by recent theory and experimental achievements in decoherence control of non-Gaussian states of light and mechanical oscillators and their applications in construction of nonlinear quantum operations.