Spatio-temporal coherence in nonequilibrium condensates of light

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Bose-Einstein condensation is defined through the existence of off diagonal long range order (ODLRO) in systems described by a bosonic field. This definition is independent of the presence of thermal equilibrium in the system, but true ODLRO typically only exists in dimensions larger than two. Since photonic condensates are only one or two-dimensional, they are characterised by quasi-condensation at best. Interestingly, the nonequilibrium condition affects the spatiotemporal phase-phase correlations that belong to the Kardar-Parisi-Zhang universality class. In this lecture, I will discuss experiments probing and theory explaining the correlations in nonequilibrium polariton condensates.