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### **Bose-Einstein Condensation of Microcavity Polaritons in Harmonic Traps**

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Polaritons in microcavities are a two-dimensional, weakly interacting boson gas, and their spatial distribution, momentum distribution, coherence properties, and excitation spectrum can all be observed. In several recent experiments, these observations are consistent with the interpretation of a quasiequilibrium Bose condensate of polaritons. In our experiments, we use a special stress geometry to create a harmonic potential for the polaritons in the plane of their motion, which is analogous to the traps used in experiments on BEC of cold atoms. Among other effects, we observe coherent light emission from the polariton condensate. Two questions arise: 1) Since the system emits coherent light, how can we distinguish it from a standard laser? 2) How do we distinguish it from some type of nonlinear amplification of the excitation light? In our experiments with a trapping potential, we can easily distinguish between these different effects. We demonstrate two transitions which occur in the same place in the same structure, one which is standard lasing and one which is polariton condensation. The quasiequilibrium polariton condensate in microcavities thus emerges as a new type of coherent light emitter.