

Abstract for an Invited Paper
for the MAR09 Meeting of
The American Physical Society

Theory of polariton condensation

PETER LITTLEWOOD, University of Cambridge

Lately, some novel experiments with planar optical microcavities make use of the mixing of excitons with photons to create composite bosons called polaritons that have a very light mass, and are thus a good candidate for high-temperature Bose condensation. Good evidence for spontaneous coherence has now been obtained.¹ There are special issues to resolve² considering the effects of low dimensionality, disorder, strong interactions, and especially strong decoherence associated with decay of the condensate into environmental photons³ — since the condensate is a special kind of laser.

¹J. Kasprzak, et al. *Nature*, 443, 409-415 (2006).

²J. Keeling, F. M. Marchetti, M. H. Szymanska, P. B. Littlewood, *Semiconductor Science and Technology*, 22, R1-26 (2007).

³M. H. Szymanska, J. Keeling, P. B. Littlewood, *Physical Review B* 75, 195331 (2007).