

Abstract Submitted  
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**Spontaneous quantum condensation in an optically-pumped microcavity far from equilibrium** PAUL EASTHAM, Imperial College London, RICHARD PHILLIPS, University of Cambridge — We propose and analyze a method for creating highly non-equilibrium quantum condensates from excitons and photons in a semiconductor microcavity on timescales shorter than any thermalization times. In a theoretical study of microcavity dynamics we show that a tailored optical pulse can directly create a supercooled exciton population by an analogue of adiabatic rapid passage. This state involves no macroscopic occupations and is thus not a condensate. At later times, however, it spontaneously develops into a quantum condensate far from thermal equilibrium. This class of condensates encompasses phenomena similar to superradiance and lasing, but also includes states which give access to non-equilibrium Bose condensation in a solid-state system.

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