

Bose-Einstein condensation of Photons

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Bose-Einstein condensation, the macroscopic ground state accumulation of particles with integer spin (bosons) at low temperature and high density, has been observed in several physical systems, including cold atomic gases and solid state physics quasiparticles. However, the most omnipresent Bose gas, blackbody radiation (radiation in thermal equilibrium with the cavity walls), does not show this phase transition. The photon number here is not conserved (vanishing chemical potential), and at low temperatures photons disappear in the cavity walls instead of occupying the cavity ground state. Here I will describe an experiment observing a Bose-Einstein condensation of photons in a dye-filled microscopic optical resonator. In my talk, I will begin with a general introduction and give an account of current work and future plans of the Bonn photon gas experiment.