

Bose-Einstein Condensate – A New State of Matter

EDSF module SPE PH3 (15 h)

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- I. Bose-Einstein Condensation: overview, properties, Onsager-Penrose criterion, Gross-Pitaevskii equation, Bogoliubov dispersion
- II. Condensation of Exciton-Polaritons in Semiconductor Microcavities
- III. Bose-Einstein Condensation in a Trap. Superconductivity, Quantum vortices, London's Equation, Ginzburg - Landau equation, Solitons
- IV. Quantum Hydrodynamics. Bloch Oscillations. Emergent Physics in Bose-Einstein Condensates: acoustic Black Holes, effective magnetic monopoles.