

BOSE-EINSTEIN CONDENSATES AS UNIVERSAL QUANTUM MATTER

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S. N. Bose gave a new identity to the quanta of light, introduced into physics by Planck and Einstein, and derived Planck's formula for the radiation spectrum. Chance events led to Einstein's insightful use of Bose's result to build a quantum theory of atomic gases, with the remarkable prediction of a new type of condensation without interactions. Though the spectacular phenomena of superfluidity and superconductivity were identified as the consequences of Bose-Einstein Condensation, the phenomenon in its near pure form, as foresaw by Einstein, was observed 70 years later in atomic gases. The quest for atomic gas BEC was behind much of the developments of laser cooling and trapping of atoms. Since then, the atomic gas BEC has grown into a major research theme and versatile research tool all over the world. I outline the development that made BEC of laser cooled atoms the promised 'Swiss army knife' of laboratory physics, with mentions of some of the examples and applications. My involvement in this field of research at 'home and the world' is briefly reviewed.
