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Einstein and Bose

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In June 1924, a relatively unknown Satyendra Nath Bose from Dacca, India, wrote a letter to Einstein beginning with "Respected Sir, I have ventured to send you the accompanying article for your perusal. I am anxious to know what you think of it. You will see that I have ventured to deduce the coefficient $8\pi\upsilon^2/c^3$in Planck's law independent of the classical electrodynamics, only assuming that the ultimate elementary regions in Phase-space have the content h^3. I do not know sufficient German to translate the paper. If you think the paper worth publication, I shall be grateful if you arrange for its publication in *Zeitschrift für Physik."* Einstein did translate the article himself and got it published. He wrote to Ehrenfest: "The Indian Bose has given a beautiful derivation of Planck's law, including the constant [i.e.$8\pi\upsilon^2/c^3$]." Einstein extended the ideas of Bose that implied, among other things, a *new* statistics for the light-quanta to the molecules of an ideal gas and wrote to Ehrenfest, 'from a certain temperature on, the molecules "condense" without attractive forces, that is, they accumulate at zero velocity. The theory is pretty, but is there also some truth to it?' Abraham Pais has called Bose's paper "the fourth and the last revolutionary papers of the old quantum theory." My paper will present the works of Bose and Einstein in their historical perspective and the eventual birth of the new quantum Bose-Einstein statistics.