Quantum Statistical Mechanics Lecture Notes

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Quantum statistics

dictates two options, either nk= 0,1, for a gas of fermions or nk= 0,1, · · · ,∞for bosons. QF k= X1 nk=0. = 1 +e β (µ − ̧ k) while for bosons the right hand side is an infinite geometric series QB k= X∞ k=0. e β (µ − ̧ k) = (1 − e β (µ − ̧ k)) − 1.

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Quantum Statistical Mechanics. p p X. VI. Quantum Statistical Mechanics. There are limitations to the applicability of classical statistical mechanics. The need to include quantum mechanical effects becomes specially apparent at low temperatures. In this section we shall first demonstrate the failure of the classical results in the contexts of heat capacities of molecular gases and solids, and the ultra-violet catastrophe in black body radiation.

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Lecture Notes for

Quantum Mechanics

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8.044 Lecture Notes Chapter 9: Quantum Ideal Gases particle creation operators with quantum number l cy l jn 1n 2:::i= (0 if n l= 1 for fermions p n l+ 1(1) P l 1 j=1 n jjn 1n 2:::n l+ 1:::i else: (17) Here the + ( ) sign applies to bosons (fermions).

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