

NEW LIGHT ON INFRARED PROBLEMS  
SECTORS, STATISTICS, SPECTRUM AND ALL THAT

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Within the setting of algebraic quantum field theory, a new approach to the general analysis of the physical state space of a theory is presented which covers theories with long range forces, such as QED. Making use of the notion of charge class, which generalizes the concept of superselection sector, infrared problems are avoided. Based on it the proper charge content of a theory, the statistics of the corresponding states and their spectral properties can be determined and classified in a systematic manner. A key ingredient in this approach is the insight that inevitable experimental limitations provide a natural geometric and Lorentz invariant infrared cutoff.

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