

MP 6: HV Quantenfeldtheorie: D. Buchholz

Zeit: Dienstag 16:30–17:10

Raum: ZHG 003

Hauptvortrag

MP 6.1 Di 16:30 ZHG 003

New light on infrared problems: Sectors, statistics, spectrum and all that — •DETLEV BUCHHOLZ — Institut für Theoretische Physik, Universität Göttingen

Within the setting of local quantum physics, 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** infrared cutoff. The results shed new light on the traditional concept of superselection rule and may also be of relevance for a deeper understanding of the phenomenon of quantum decoherence.
(Joint work with S. Doplicher and J.E. Roberts)