



Im Rahmen des Physikkolloquiums spricht

Herr Prof. Dr. Philippe Blanchard

Universität Bielefeld, Deutschland

über

The ETH-Approach

Abstract:

The "Copenhagen" formal structure of Quantum Theory is the most well confirmed prediction ever made in science. As an algorithm is "Copenhagen" perfect. Because it works so well on all known scales, we need to understand why it works so well.

Von Neumann's algebraic framework is general enough to accommodate both classical and quantum systems and therefore fundamental issues of quantum physics such as decoherence - the basic building block in ETH - are best discussed in this setting.

The "ETH-approach" where E stands for Events, T for Trees and H for Histories is a novel events enhanced interpretation of Quantum Theory based on a fundamental ingredient added to "Copenhagen" the "Principle of Loss of Access to Information".

It enables us to introduce a precise notion of "events", to understand why and when events can happen and therefore to exhibit the stochastic dynamics of states featuring events (how probability enters given the deterministic nature of the Schrödinger equation). This evolution hints a new variety of stochastic branching process with a kind of non-commutative state space.

Summing up: "ETH" recovers "Copenhagen" in a mathematically consistent way and allows to understand "Quantum Mechanics without observers".