

AKPhil 4: Quantum Cosmology 2

Zeit: Mittwoch 16:45–17:45

Raum: KIP SR 3.401

Hauptvortrag AKPhil 4.1 Mi 16:45 KIP SR 3.401
“Wie alles sich zum Ganzen webt”: on a new orientation for the concept of matter, based on relations between quantum physics and cosmology. — •THOMAS GÖRNITZ — Institut für Didaktik der Physik, J.W.Goethe-Universität, D-60438 Frankfurt/Main, Max-von-Laue-Str. 1

It is common sense between physicists that in the beginning the cosmos is in a narrow relationship to quantum phenomena. Because of the universal validity of quantum theory this relation remains significant in the whole cosmic evolution. Whereas a classical approach is sufficient for the description of many phenomena it is no more useful at last for the case of the ground state of a system. This holds also for the cosmos. The black holes are that part of physics where quantum theory and

gravitational theory come into close contact. There a Gedankenexperiment becomes possible that clarifies the fundamental role of abstract quantum information. We give it a new name (Protyposis) because it must be imagined without emitter, receiver and moreover without any concrete meaning. This meaning-free abstract quantum information is defined by means of black holes and cosmology. Protyposis enables a new conception for “matter” and makes possible to overcome the problems of the “Lego-world-view”, which result from the attempt to find the “simple and therefore basic concepts” in the range of spatial smallness. Matter can be understood now as “formed and condensed quantum information”. But on a first view it is nothing to see from its character of being information, as like matter does not appear as “pure motion”, what it is also because of $E=mc^2$.