GR 18: Quantum Gravity and Quantum Cosmology 2

Time: Friday 11:00–11:45 Location: H-HS IX

GR 18.1 Fri 11:00 H-HS IX

The Density Parameter Ω_Λ of the Dark Energy is a Function of G, c and h, and it Evolves with Time — •Hans-Otto Carmesin — Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

The nature of the dark energy is modeled: First, a very general and fundamental density problem of the early universe is pointed our and resolved by dimensional phase transitions. With it, the concept of the dimensional horizon is introduced. As a consequence, there occur zero-point oscillations of the quantized gravitational field. Therefrom, $\Omega_\Lambda(G, c, h)$ is derived as a function of the universal constants G, c and h. The result is obtained from a completely fundamental theory without any fit parameters. In addition, the actual controversy of the Hubble - constant is resolved (Carmesin, H.-O. (2019): Die Grundschwingungen des Universums - The Cosmic Unification - With 8 Fundamental Solutions based on G, c and h - With Answers to 42 Frequently Asked Questions. Berlin: Verlag Dr. Köster.).

GR 18.2 Fri 11:15 H-HS IX

Quantum Mechanic Analysis of Masses in their Own Gravitational Field — Hans-Otto Carmesin[1,2,3] and •Maximilian Carmesin[4] — [1]Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — [2]Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — [3]Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen — [4]Arndt Gymnasium, Lindenstraße 52, 47798 Krefeld

The position of masses can be measured and is based on laws describing fundamental interactions among matter. For objects at a very high density, the gravitational force is the most important for describing their interactions. As a result from the Heisenberg uncertainty principle, measurements of complementary properties cannot be exact, examples are position and momentum. Accordingly, such objects have to be investigated in terms of a mass distribution. This is an essential difference to classical mechanics, viewing objects as masses concentrated at a single point. Such a model is not exact, but sufficient in many fields of physics, except quantum physics. This project numerically simulates the gravitational potential of a particle in a 3-dimensional space. Thereby, a mass distribution instead of a concentrated mass is modeled. For this purpose, a computer simulation has been developed. As a result, properties of the gravitational potential and of the wave function of a particle have been examined.

GR 18.3 Fri 11:30 H-HS IX

The equivalence of gravity and gravitational time dilation in general relativity and in quantum mechanics — •René Friedrich — Strasbourg

The curved spacetime of the Schwarzschild metric seems to be incompatible with quantum mechanics. But gravity may not only be represented by curved spacetime, it is also entirely described by gravitational time dilation in flat, uncurved space.

This talk is the third part of the concept of quantum gravity without need for any additional theory: Gravity modulates in the form of gravitational time dilation the proper time parameter of the worldlines of quantum systems.