GR 10: Poster

Zeit: Donnerstag 12:25–12:34 Raum: Dekanatsgang

GR 10.1 Do 12:25 Dekanatsgang

A Variable Speed of Light Theory of Gravity Based on Ideas of Dirac, Sciama and Dicke — •Alexander Unzicker — Pestalozzi-Gymnasium München

Though the contributions to cosmology originating from the above named researchers seem abandoned today, their basic ideas can be combined. We analyze Dirac's article on the large number hypothesis (1938), Sciama's proposal of realizing Mach's principle (1953), and Dicke's scalar theory of gravitation with a variable speed of light (1957). The description of curvature by a refractive index given in the latter is extended to matter waves using de Broglies relation for phase velocities. Thus Sciama's hypothesis on the gravitational constant G, a quantitative version Mach's principle, is recovered. Applied to cosmology, this model satisfies Dirac's large number hypotheses (LNH). While Dicke's proposal in first approximation agrees with the classical tests of GR, the cosmological redshift arises from a shortening of measuring rods rather than an expansion of space. The speed of light turns out to be the increase of the horizon R. A related discussion is given in arxiv:0708.3518.

GR 10.2 Do 12:25 Dekanatsgang

Is the Speed of Light 'c' a True Constant? — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

Einstein has - in his structure-based theory of relativity - stated that the speed of light 'c' is a true constant under all circumstances. The physical community has accepted this in spite of the problems arising from this paradigm; see the deadlock situation of present physics (e.g. Quantum Gravity).

The constancy of the speed of light has 3 aspects:

1.) Is 'c' the same for an observer in motion or at rest?

Einstein says: YES – Lorentz says: NO; only the ¿measured¡ 'c' is constant resulting from the contraction of measuring rods and the desynchronization of clocks during motion.

2.) Is 'c' the same inside and outside a gravitational field?

Einstein says: YES – We say: NO; 'c' is reduced in a gravitational field as the direct measurement tells us; the apparent curvature of space is in truth a refraction effect caused by the variation of 'c'

3.) Was 'c' a constant during the development of the universe?

Einstein says: YES – Magueijo says: NO; if we accept an (adapting) decrease of 'c', we can avoid the inflation in cosmology and the landscape of 10^{100} universes.

Note that the alternative approaches mentioned above yield the same mathematical results as the traditional version of Einstein, to the extent as they are confirmed by experiments.

Further information: www.ag-physics.org/relat and /gravity

GR 10.3 Do 12:25 Dekanatsgang

Special Relativity Derived from the Structure of Matter — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

Historically, the phenomena of relativity gave us a great chance for a better understanding of the structure of matter. Some of the founders of SR like H. Lorentz proceeded on this >physical< way.

This chance, however, was given away when Einstein presented a theory, which solved the relativity related problems with an abstract concept of space and time, without any relation to matter. We can excuse Einstein by the fact that at his time there was only a limited knowledge about matter.

Stimulated by the deadlock in present physics, we should re-develop the process of understanding relativity. We should use the contraction of fields (Lorentz) rather than the contraction of space; and as well the slow down of elementary oscillators (Ziegler, Schrödinger) rather than the dilation of time.

This presentation will demonstrate for the example of dilation, how much our physical understanding will profit, if we return to a >physical< understanding of such phenomena.

We arrive at the same mathematics like with Einstein (= Lorentz Transformation). And we win a theory of relativity which is so easy to comprehend, that it can be taken into physics lessons at school.

And we find an easily understandable mechanism that explains the increase of mass at motion and the mass-energy-relation, without any use of abstract principles.

Further information: www.ag-physics.org/relat