GR 13: Quantum gravity and cosmology

Time: Friday 11:00–12:15 Location: H4

GR 13.1 Fri 11:00 H4

Solution of the H0 Tension — •Hans-Otto Carmesin — Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — Bahnhofstraße — Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

In the standard model of cosmology, the Hubble constant should not vary as a function of the time.

However, when the Hubble constant H0 is measured, then probes that have been emitted at an earlier time or at a corresponding redshift z are used, and it turns out that the observed values of H0 depend on that redshift z, H0=H0(z,observation). That discrepancy is called H0 tension.

I derive a theory of dark energy, based on quantum physics and gravity. With my theory, I derive a term for the above function, H0(z,theory). That term is in precise accordance with observation, so my theory of the dark energy solves the H0 tension. I emphasize that the only numerical input used in my theory is the present day time after Big Bang combined with the universal constants G, c, kB and h.

Moreover, my theory solves various other fundamental problems of physics, see Carmesin, Hans-Otto (2021): Quanta of Spacetime Explain Observations, Dark Energy, Graviton and Nonlocality. Berlin, Dr. Köster Verlag, see also Carmesin, Hans-Otto (2019): Die Grundschwingungen des Universums - The Cosmic Unification - With 8 Fundamental Solutions based on G, c and h. Berlin: Dr. Köster Verlag.

GR 13.2 Fri 11:15 H4

Solution of the Horizon Problem — •Philipp Schöneberg[1] and Hans-Otto Carmesin[1,2,3] — [1]Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — [2]Studienseminar Stade, Bahnhofstraße 5, 21680 Stade — [3]Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

In the early universe, the density was very high. As a consequence, there occurred gravitational instabilities and dimensional phase transitions. These have been derived in three very different physical systems, see Carmesin, Hans-Otto (2021): Quanta of Spacetime Explain Observations, Dark Energy, Graviton and Nonlocality. Berlin, Dr. Köster Verlag.

Using these phase transitions, the light horizon as a function of time R(t) can be calculated, ranging from the Planck length to the present day value. With it we derive the solution of the horizon problem.

GR 13.3 Fri 11:30 H4

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.

GR 13.4 Fri 11:45 H4

Für ein einheitliches Weltbild der Physik — •Helmut Hille — Heilbronn, Fritz-Haber-Straße 34

Es ist nur menschliche Sehgewohnheit, getrennt Gesehenes als definitiv getrennt Existierendes zu halten, obgleich schon das System Sonne-Erde-Mond das Gegenteil beweist. Keiner dieser Körper hätte ohne den anderen seine Bahn und es gäbe auf der Erde keine Gezeiten. Verschränkte Quanten haben gezeigt, dass ihr gemeinsamer Ursprung sie sich als Eines verhalten lassen. Ebenso ist der Big Bang der gemeinsame Ursprung aller Materie unseres Kosmos zu einer neuen immanenten Einheit, die sich in Form der Gravitation zusammenhalten möchte, während sie äußerlich gleichzeitig expandiert. Die Gravitation ist nur ein weiterer Beleg über die Macht des Unsichtbaren, die es endlich zu akzeptieren gilt. Heute sucht man als Ausweg das Unsichtbare in dunkler Materie und Energie. Aber das Unsichtbare, um das es mir geht, ist kein Teilchen. Es ist nur die Rückseite des Sichtbaren, die wir mit der Gravitationskonstante erfassen. So ist die Gravitation eine Form der Verschränkung aller betroffenen Materie (auch Strahlung ist Materie), von mir hier Superverschränkung genannt. In der Verbindung mit drei weiteren Prämissen ergibt sich ein einheitliches Weltbild der Physik von großer Schönheit, das ein rationales ist, das auf klaren, einsichtigen Prämissen beruht, die jedermann nachvollziehen kann.

GR 13.5 Fri 12:00 H4

Quantum gravity by elimination of spacetime — •René Friedrich — Strasbourg

General relativity without curved spacetime? Unconceivable, you might say. But why? For Marcel Grossmann, the Riemannian geometry was nothing more than an efficient tool for the description of Einstein's main postulates of general relativity, in particular the equivalency principle. And today, spacetime turns out to be the only reason why things are going wrong in quantum gravity.

Eliminating spacetime means to restitute to the universe its absolute, observer-independent character. In spacetime, particle worldlines are parameterized by the coordinate time of the observer, and different observers with different spacetime coordinate systems get different results. Instead, we must parameterize each worldline by its respective proper time, in order to get a universe on which all observers agree and which complies with quantum mechanics.

The result is a completely Lorentz-invariant description of the universe: In a manifold of absolute space without common time axis, worldlines are parameterized by their respective proper time. Accordingly, lightlike phenomena such as electromagnetic and gravity fields with zero proper time are reduced to zero. But what about gravity? Gravity may not only be expressed as curved spacetime but equivalently also as gravitational time dilation in absolute, flat space, modulating the proper time parameter of worldlines.