GR 9: Poster

Time: Wednesday 16:15–18:15 Location: ZHG Foyer 1. OG

GR 9.1 Wed 16:15 ZHG Foyer 1. OG

Quantum gravity without trouble — •René Friedrich — Strasbourg

Lorentzian spacetime, incredibly, proves to be a 100-year-old optical illusion, an impossible object: The banal fact of the non-zero length of worldlines of lightlike light rays shows us that spacetime diagrams and spacetime manifolds have Euclidean metric, because if they were Lorentzian (pseudo-Riemannian), the length of lightlike phenomena would be zero. Accordingly, spacetime is not fundamental, it is mere observation, and the underlying Lorentz-invariant real universe (compatible with quantum mechanics) consists of worldlines in absolute 3D space, each worldline being parameterized by its respective proper time. - Regarding gravity, we can use the fact that gravity may be described not only as curved spacetime, but also equivalently as gravitational time dilation in threedimensional flat space: A comparison Schwarzschild metric / Minkowski metric shows that the difference between flat and curved spacetime can be entirely reduced to gravitational time dilation. - Quantum gravity in only one sentence: Gravity in the form of gravitational time dilation slows down the proper time frequency of the worldlines of quantum systems with mass that are parameterized by their respective proper time. - More: Quantum gravity without trouble, Quantengravitation ohne Mühe, La gravité quantique sans peine.

GR 9.2 Wed 16:15 ZHG Foyer 1. OG

Comment on the Sommerfeld Fine Structure Constant tension — •Manfred Geilhaupt — HS Niederrhein Mönchengladbach

In todays physics, the fine-structure constant (alpha) is a fundamental physical constant which quantifies the strength of the electromagnetic interaction between elementary charged particles. The constant alpha was introduced in 1916 by Arnold Sommerfeld. However, alpha still is an unsolved theoretical and even experimental physical problem up to now! Alpha from atomic interferometric experiments shows a large difference compared to their high accuracy:

1. 2018 Parker et al. 1/137.035999046(27), atomic interferometer experiment

2. 2020 Morel et al. 1/137.035999206(11), atomic interferometer experiment

3. 2011 More et al. 1/137.035999084(15), quantum hall experiment. The 2011 last experimental von Klitzing constant RK=25812.807442(30)Ohm accuracy can be increased by an order of magnitude today. So the RK=e^2/h makes the difference.

4. 2019 form Codata given alphaC= 1/137.035999177

5. 2019 from Codata given alphaRKC=1/137.035999127 based on RKC= 25812.807450(00)Ohm (exact defined) does not match. The presentation contains two answers to the question about tension. Critics appreciated. (A. Einstein: Ein Problem kann man nicht mit der Denkweise lösen, durch die es entstanden ist.)

GR 9.3 Wed 16:15 ZHG Foyer 1. OG

What was before the Big Bang? — •Jürgen Brandes — Karlsbad, Germany

The Einstein interpretation (EI, classical general theory of relativity) says: Before the Big Bang there was nothing, neither space, nor time, nor space-time. But the EI is contradicted by the measurement of two different Hubble constants, because the expansion of the universe cannot take place at two different speeds at the same time. That leaves the Lorentz interpretation (LI): The Big Bang is the explosion of a supermassive object. Its mass must come from somewhere. The simplest assumption: by accretion from emissions from neighboring galaxy clusters on a large scale analogous to the growth of galaxy nuclei on a small scale. This is supported by the observation of galaxies older than the Big Bang [1]. **The main objection:** Supermassive objects are black holes and cannot explode. The proposed solution can also be found at *www.grt-li.de* or [2].

[1] Labbé, I., van Dokkum, P., Nelson, E. *et al.* A population of red candidate massive galaxies 600 Myr after the Big Bang. *Nature* 616, 266*269 (2023) and Olivia Dittrich Berliner Morgenpost 6.3.2023

[2] J. Brandes, J. Czerniawski, L. Neidhart: *Special and general relativity for physicists and philosophers* VRI: 2023, chapter 21, 22, page 279

GR 9.4 Wed 16:15 ZHG Foyer 1. OG

Die Dimensionale Physik erklärt den Aufbau der Naturkonstanten c, G und h nur aus der ART heraus — •Christian Kosmak — Working Group Dimensional Physics, Würzburg

In der Theorie der Dimensionale Physik wird der Ansatz gewählt, dass eine Raumzeitdichte die Quelle der Raumzeitkrümmung ist. Jegliches Masse-Energie-Äquivalent ist eine direkte geometrische Abbildung in der Raumzeit selbst. Dadurch erhält die Raumzeit Grenzen zu einer höherdimensionalen Raumzeit und in unendlich vielen niederdimensionalen Raumzeiten. Diese Grenzen bestimmen den Aufbau der Naturkonstanten c, G und h. Das Plancksche Wirkungsquantum und dadurch die Compton-Wellenlänge eines beliebigen Objektes (Raumzeitdichte) ergeben sich zwingend aus der Struktur der Raumzeit. Dies bedeutet, dass die Allgemeine Relativitätstheorie vorgibt, wie die Quantenfeldtheorie aufgebaut sein muss. Die Raumzeit ist nicht nur eine dynamische Bühne, sondern der einzige Akteur. Internetseite: https://dimensionale-physik.de/ YouTube-Kanal: https://www.youtube.com/@DimensionalePhysik

GR 9.5 Wed 16:15 ZHG Foyer 1. OG

Relativity. Exclusively a speed problem. — •Osvaldo Domann — Stephanstr. 42, 85077 Manching, Germany

Space and time are variables of our physical world that are intrinsically linked together. Laws that are mathematically described as *independent of time*, like the Coulomb and gravitation laws, are the result of repetitive actions of the *time variations* of linear momenta. To arrive to the relativistic transformation equations Einstein omitted the physical interaction of light with the measuring equipment, interaction which makes that light speed is the same in all inertial frames. The results of the omission are transformation rules that show the unphysical time dilation and length contraction. The Lorenz transformation applied on speed variables instead of space and time, as shown in the proposed approach, is formulated with absolute time for all frames and integrates the physical interactions at measuring instrument, which produce the constancy of light speed in all inertial frames. Special relativity with its wrong time dilation and length contraction is used by our theorists to explain experimentally measured data that cannot be explained with the standard model. The results are models like general relativity as the theory for gravitation, a wrong geometric theory not compatible with quantum mechanics. The methodology used by our theorists is equal to the one used to defend geo-centrism. Instead of accepting the new approach of helio-centrism, wrong epicycles were added to geo-centrism resulting in a catastrophic standard model. More at www.odomann.com

GR 9.6 Wed 16:15 ZHG Foyer 1. OG

Impact of Topological Structures on Neutron Star Rotation and Their Observational Significance — •Debojoti Kuzur — Raghunathpur College, Purulia, West Bengal, India

Rotational irregularities are an important observational feature of most pulsars, often manifesting as glitches which are sudden increases in spin angular velocity. Despite extensive study, the underlying mechanism of these glitches remains unresolved. In this research, we explore the role of nontrivial topological defects, specifically Nambu-Goto type cosmic strings, in influencing pulsar spin irregularities. These one-dimensional defects, formed during symmetry-breaking phase transitions, can interact with neutron stars when trapped within their cores.

Our findings suggest that such cosmic strings can couple their tension with the star's angular velocity, resulting in abrupt rotational changes characteristic of pulsar glitches. Additionally, we examine how this coupling could generate detectable gravitational waves, comprising both continuous and burst-like components. The evolution of string cusps within neutron star cores and changes in the star's mass quadrupole moment due to rotation may produce distinctive gravitational wave signatures, potentially detectable by advanced LIGO (advLIGO) within its noise threshold.

This study establishes a possible link between cosmic strings, pulsar glitches, and gravitational wave emissions, offering a framework to test the existence and astrophysical effects of topological defects through observational data.

GR 9.7 Wed 16:15 ZHG Foyer 1. OG

The identification of dark matter — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

The main theme of the dark matter phenomenon is that the galaxies, and also the stars around the galaxies, are rotating at too high a speed. It is considered to be one of the biggest problems in modern physics. This is because the traditional explanation of dark matter as particles, or alternatively a modified law of gravity (MOND), has been largely disproved. This concerns the assumption of special particles due to 'dynamical friction' around big galaxies with orbiting dwarfs, and MOND due to the motion distribution in dwarf galaxies.

The observable spatial distribution of the dark matter effect around galaxies and clusters leads to a solution, because it is identical to the distribution of photons. The result is a different - mass-independent - law of gravity. This contradicts Newton's law of gravity and Einstein's GRT, but is consistent with all observations. And so it is also a test of Einstein's interpretation of relativity.

This solution gives correct quantitative results where data exist, without using free parameters.

Further info: ag-physics.org/gravity

GR 9.8 Wed 16:15 ZHG Foyer 1. OG

Quantum gravity by elimination of spacetime - From the 4D manifold to Lorentz-invariant 1D worldlines — •René Friedrich — Strasbourg

The current interpretation of general relativity (based on the concept of Einstein and Grossmann in 1913) is a sort of "astrometry": Curved spacetime is perfect for astronomical observation and experimental physics, but not for theoretical physics because it is complex, redundant and does not admit the smooth decantation of fundamental conclusions (including quantum gravity). Moreover, since 1905 we know that each particle is following its own clock, that there is no common absolute time axis, and, by consequence, that spacetime is no longer a fundamental notion as it was within Newtonian spacetime. - And gravity? It will also be shown that gravity is perfectly equivalent to gravitational time dilation, acting on onedimensional worldlines in uncurved threedimensional space, paving the way for a worldline-based concept that is compatible with quantum mechanics: Worldlines of quantum systems with mass are parameterized by their respective proper time frequency, and gravity in the form of gravitational time dilation is just modifying this frequency of the worldline. - Book: Quantum gravity without trouble, Quantengravitation ohne Mühe, La gravité quantique sans peine.

GR 9.9 Wed 16:15 ZHG Foyer 1. OG

Über den Wirklichkeitsgehalt der Materie — •Roland Schmidt — Schwalbenweg 21, 34225 Baunatal

In der Newtonschen Theorie ist Wirklichkeit der determinierte Ablauf eines objektiven und allgemein geltenden Geschehens. In der relativistischen Nachbesserung geht dieser absolute Charakter verloren. Es lassen sich nunmehr ausschließlich subjektiv erlebte Wirklichkeiten gegeneinander abgleichen. Der Umstand, dass diese Subjektivierung durch die klassische Elektrodynamik erzwungen wird, scheint keineswegs zufällig; spielt doch bei der metaphysischen Betrachtung subjektiver Wahrnehmung die Idee vom Licht eine ganz entscheidende Rolle. Allerdings sind subjektive Wahrnehmungen allein auf klassischer Grundlage nicht erklärbar. Das abschließende Vordringen elektromagnetischer Potenzialität in die zerebralen Zusammenhänge eines Subjekts erfordert nämlich Ansätze quantenphysikalischer Art. Ich werde zeigen, dass sich die Aufspaltung der physikalischen Theorie in einen klassischen und quantenmechanischen Zweig durch eine Subjektivierung der elektromagnetischen Wechselwirkungen beheben lässt. Demnach resultieren alle klassischen Kategorien wie Raum, Gegenwart oder das Dasein gegenständlicher Bedeutsamkeiten aus einem grundlegenden Symmetriebruch, der mit dem Erleben zerebral-feststellender Zustandssysteme einhergeht. Empirischer Ausdruck davon ist die kosmologische Rotverschiebung, die in meiner subjektivierten Auslegung aus dem Umstand folgt, dass die elektromagnetische Trägheit grundlegender Teilchen gegen den kosmologischen Ereignishorizont hin allmählich verschwindet.

GR 9.10 Wed 16:15 ZHG Foyer 1. OG

Zur Dynamik des Raumes, oder: Was ist Zeit? — •Heinrich Feuerbach — Warschau,Polen

Die Frage danach, was "Zeit" eigentlich ist, ist die wohl tiefgründigste Frage der Physik. Bisher wurden Zeit und Raum als ein globaler, statischer Hintergrund betrachtet oder als eine Bühne, vor der sich die physikalischen Prozesse abspielen. Der Autor stellt das Gegenteil vor: Raum und Zeit als aktive Mitspieler. Dazu wird der Raum als äußerst dynamisch angenommen.

Mit diesen vier Postulaten:

1. Der Raum expandiert in vier Dimensionen mit Lichtgeschwindigkeit; 2. Diese Expansion ist Zeit; 3. Zeit ist äquivalent zur Lichtgeschwindigkeit; 4. Masse ist ein Widerstand zur Raumexpansion und antivalent zur Zeit

entsteht eine erweiterte geometrische Erklärung für die Gravitation.

Die gravitative Zeitdilatation und -Feldstärke ergeben sich inhaltlich und mathematisch direkt aus diesen Postulaten. Darüberhinaus werden folgende Begriffe eingeführt:

- Relative Lichtgeschwindigkeit; - Geschwindigkeitserhaltungssatz; - Strömungs-Widerstands-Prinzip; - Lokale Zeit; - Zeitliche Höhe; - Oberraum; - Gravitativer Widerstand.

Mathematisch wird aus den Postulaten eine DGL formuliert und deren Lösung für den Schwarzschildfall vorgestellt. Die Vierdimensionalität der Raumzeit selbst wird über Quaternionen abgebildet. Abschliessend werden mögliche Tests, neue Vorhersagen, und der Zusammenhang zur ART beschrieben.

GR 9.11 Wed 16:15 ZHG Foyer 1. OG

Kaluza from particles to galaxies — •Thomas Schindelbeck — IRAEPH Mainz

Reducing Kaluzas original ansatz to inserting the electromagnetic potentials into a 5D metric and dropping all other assumptions provides a coherent, consistent and quantitative description of phenomena related to particles and particle interaction, e.g.

1) with boundary condition spin 1/2 a convergent series of quantized particle energies, with limits given by the energy values of the electron and the Higgs vacuum expectation value,

2) electromagnetic and gravitational terms will be linked by a series expansion,

3) minor terms in the metric will give a term in the order of magnitude of vacuum density / cosmological constant,

4) the interpretation as a 5D deSitter space gives an expression for the Baryonic Tully Fisher Relation of galactic rotation curves that can be traced back to the particle level.

The model can be expressed ab initio, i.e. without free parameters.
https://zenodo.org/record/3930485

GR 9.12 Wed 16:15 ZHG Foyer 1. OG

Visualizing Curved Spacetime: Curvature Approximation with Cosmological Sector Models via a Web App — •Vassilios Marakis, Corvin Zahn, and Ute Kraus — Universität Hildesheim

The sector model provides a visualization of curved spacetime by dividing the coordinate space into discrete blocks of flat Minkowski space. By applying the Regge calculus and block-to-block transformations, it is possible to approximate the curvature values of the Riemann curvature tensor at specific points in spacetime. Through a web application, we study the effectiveness of this visual approach in estimating these values and examine how increasing the refinement of the coordinate space improves the accuracy of the approximation. This method is demonstrated using a cosmological example featuring a positive cosmological constant.

GR 9.13 Wed 16:15 ZHG Foyer 1. OG

Discoveries at the Time Triangle of Sun, Earth and Moon — •Hans-Otto Carmesin — Athenaeum, Harsefelder Str. 40, 21680 Stade — Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

Navigation in space requires reliable and precise clocks on spacecrafts and celestial bodies. For instance, these are essential in order to measure the light travel distance in an interplanetary mission. In order to achieve such time standards in the interplanetary space, general relativity is used, and convenient as well as appropriate frames of reference must be developed (Ashby 2024).

An analysis of the triple Sun, Earth and Moon exhibits an unrealistic idealization inherent to present - day relativity (Carmesin 2025). This analytic result is equivalently transferred to GPS satellites, and these permanently confirm this result empirically.

In general, physically realistic frames can obtained with help of a classical key measurement. This overcomes the idealization and provides precise and reliable frames for interplanetary navigation and beyond. More generally, a wave function is provided that is fundamental in the dynamics of space. Literature: Ashby, Neil; Patla, Bijunath R. (2024): A Relativistic Framework to estimate Clock Rates on the Moon. The

Astronomical Journal, 168 (112), 14pp. Carmesin, H.-O. (2025): On the Dynamics of Time, Space and Quanta. Berlin: Verlag Dr. Köster. More information: https://www.researchgate.net/profile/Hans-Otto-Carmesin

GR 9.14 Wed 16:15 ZHG Foyer 1. OG

Solar-like Flares Generated in Strongly Magnetised Binary Neutron Star Merger Remnants — •Jinliang Jiang[1], Harry Ho-yin Ng[1], Michail Chabanov[1,2], and Luciano Rezzolla[1,3,4] — [1]Institute for Theoretical Physics, Goethe University, Max-von-Laue-Str. 1, 60438 Frankfurt am Main, Germany — [2]Center for Computational Relativity and Gravitation School of Mathematical Sciences, Rochester Institute of Technology, 85 Lomb Memorial Drive, Rochester, New York 14623, USA — [3]School of Mathematics, Trinity College, Dublin 2, Ireland — [4]Frankfurt Institute for Advanced Studies, Ruth-Moufang-Str. 1, 60438 Frankfurt am Main, Germany

We investigate the impact of the magnetic-field strength on the long-term (i.e., 200ms) and high-resolution (i.e., 150m) evolutions of the "magnetar" resulting from the merger of two neutron stars with a realistic equation of state. For sufficiently large magnetic fields, we observe the loss of differential rotation in the merger remnant and the generation of magnetic flares in the outer layers of the remnant that have several similarities with solar flares. These flares, that are driven by various magneto-hydrodynamics instabilities and in particular by the Parker instability, are responsible not only for intense and collimated Poynting flux outbursts, but also for low-latitude emissions. The novel long-term phenomenology presented here offers the possibility of seeking corresponding signatures from the observations of short gamma-ray bursts and hence revealing the existence of a long-lived strongly magnetized remnant.

GR 9.15 Wed 16:15 ZHG Foyer 1. OG

Artemis, the Lunar Standard Time and Beyond — •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 currently running Artemis project includes the implementation of a Moon station. For it, a Standard Lunar Time is currently being developed. For that purpose, and in general, appropriate reference frames must be developed (Ashby 2024, p. 1). I present a symmetry transformation that provides appropriate reference frames in general (Carmesin 2025). These symmetry based frames provide especially simple laws of general relativity: essentially the laws proposed by Einstein. These appropriate frames are confirmed by the Spacelab and by GPS satellites. I predict the times shown by clocks at various places in the universe: at Earth, at spacecrafts, at the Moon, at planets and at other celestial bodies. The Artemis mission can test some typical predictions.

Literature:

Ashby, Neil; Patla, Bijunath R. (2024): A Relativistic Framework to estimate Clock Rates on the Moon. The Astronomical Journal, 168 (112), 14pp.

Carmesin, H.-O. (2025): On the Dynamics of Time, Space and Quanta. Berlin: Verlag Dr. Köster.

More information: https://www.researchgate.net/profile/Hans-Otto-Carmesin

GR 9.16 Wed 16:15 ZHG Foyer 1. OG

Analysis of Global Time Dilation — •Yang Jacky[1] and Hans-Otto Carmesin[1,2,3] — [1]Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen — [2]Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — [3]Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade

We analyze the global concept of time. Firstly, we use the global flatness of space, in order to derive a global uniform evolution of time. Thereby, we use the ΛCDM model with a homogeneous universe.

Secondly, we extend that theory by heterogeneity. For it, we apply the linear growth theory. As a theoretical tool, we use the volume dynamics, see Carmesin (2024).

Thirdly, we analyze the data of the Hubble tension, in order to derive a global time evolution therefrom.

In all cases, we evaluate the age of the universe. Thereby, we use cosmological parameters achieved by the Planck collaboration (2020).

Fourthly, we analyze the global time evolution by comparing and critically discussing the above three methods.

Literature:

Carmesin, H.-O. (2024): How Volume Portions Form and Found Light, Gravity and Quanta. Berlin: Verlag Dr. Köster.

Planck Collaboration (2020): Planck 2018 results. VI. Cosmological parameters. Astronomy and Astrophysics, pp 1-73.

GR 9.17 Wed 16:15 ZHG Foyer 1. OG

Investigation of the Dynamics of Space and Energy at a Black Hole — •Renner Ivan[1], Neumann Jeremy[1], and Carmesin Hans-Otto[1,2,3] — [1]Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — [2]Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — [3]Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

We investigate the dynamics of space and energy at a black hole. For it, we use the exactly derived dynamics of volume in nature (Carmesin 2024). Thereby, we use computer experiments. In particular, we study the simultaneous formation, annihilation and propagation of volume portion in a statistical manner at a black hole. Hereby, we discover critical values that characterize the dynamics at a macroscopic level. We compare our findings with observation.

Literature:

Carmesin, H.-O. (2024): How Volume Portions Form and Found Light, Gravity and Quanta. Berlin: Verlag Dr. Köster.

Akiyama, Kazunori and others (2019): First M87 Event Horizon Telescope Results. IV. Imaging the Central Supermassive Black Hole. The Astrophysical Journal. 875, pp 1-17.

GR 9.18 Wed 16:15 ZHG Foyer 1. OG

Universal Quantization Discovered with Special Relativity — •Hans-Otto Carmesin — Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade — Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen

Quantum physics is a very successful field of science with omnipresent relevant applications in everyday life. An exciting question is still, what is the fundamental reason for the fact of quantization.

Curved space, light waves and gravity provide the fact of quantization with a universal constant of quantization (Carmesin 2023). This result is improved here: The used conditions are minimized. Thus, the achieved insight is maximized. Here, the only used conditions are flat space, light waves and reflection. The result shows that quantum physics is a very fundamental and ideal fact of nature (Carmesin 2025).

In teaching, the Doppler effect is analyzed in the context of a radar control.

Literature

Carmesin, H.-O. (2023): Students Exactly Derive Quantization and its Universality. PhyDid B, FU Berlin, pp 39-44.

Carmesin, H.-O. (2025): On the Dynamics of Time, Space and Quanta. Berlin: Verlag Dr. Köster.

More information: https://www.researchgate.net/profile/Hans-Otto-Carmesin

GR 9.19 Wed 16:15 ZHG Foyer 1. OG

Discovery of Real and Idealized Frames with GPS Satellites — •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 GPS navigation system is omnipresent in modern traffic and navigation (Ashby 2024). Moreover, the GPS satellites provide very precise and multiply related measurements of space and time. Students from class 10 can analyze such relations with linear and quadratic equations, including their inverse terms.

Thereby, they discover an idealization inherent to the present - day theory of special relativity and of general relativity (Carmesin 2025). This analytic result is permanently confirmed empirically by the working of the GPS navigational system.

In general, a symmetry transformation provides realistic frames. This provides fundamental insights about time, space and frames that are essential for the navigation of spacecrafts in interplanetary space and beyond.

Literature

Ashby, Neil; Patla, Bijunath R. (2024): A Relativistic Framework to

estimate Clock Rates on the Moon. The Astronomical Journal, 168 (112), 14pp.

Carmesin, H.-O. (2025): On the Dynamics of Time, Space and Quanta. Berlin: Verlag Dr. Köster.