GR 10: Poster

Time: Wednesday 16:15–18:45 Location: Redoutensaal

GR 10.1 Wed 16:15 Redoutensaal

Doubly-periodic Processes in Particle Accelerators, Fusion Reactors and Artificial Photosynthesis — •Otto Ziep — Independent Scholar, 13089, Berlin, Germany

Vacuum energy for a real Lagrangian can be undercut by least squares of complex conformal fields where stress-energy resembles a Schwarzian derivative for a doubly-periodic iteration. The dynamics of zeros of holomorphic functions yields a Newton fractal quadratic in mass 0=δmδm' with phantom energy ρ(dark) which resembles spin zero fields. Local stationary states ρ-ρ(dark)=0 are predicted similar to the Dirac model of additive creation of matter ρ. For particle accelerators, fusion reactors and in artificial photosynthesis a doubly-periodic processing called breathing mode is designed which predicts cooling due to generated complex dark matter ρ(dark).

[1] O. Ziep, Cosmic Rays, Aerosol-Photosynthesis and Vegetational Air Ion, Journal of Modern Physics, Bd. 16, p. 1179-1192, 2025, https://doi.org/10.4236/jmp.2025.168059

[2] O. Ziep, Doubly- Periodic Processing in Particle Accelerators and Fusion Reactors, submitted to Journal of High Energy Physics, Gravitation and Cosmology, 2025.

[3] O. Ziep, Doubly-Periodic Atmospheric Power Plants,submitted to Discover Energy, 2025.

GR 10.2 Wed 16:15 Redoutensaal

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

The considerations of the previous year are continued.

A good overview of the numerous observations that contradict the cosmological principle of GRT can be found in [1]. These include the Hubble Tension [2] as well as the remarkable observation that the expanding universe has angular momentum, as if it were a rotating stellar object. A fundamental *theoretical* objection to the idea of GRT that space expands is its contradiction with the law of conservation of energy. The energy of background radiation (CMB) decreased from 3000°K to 2.7°K over time due to space expansion. *However, it is unclear where the lost energy remains.* The LI of GRT does explain it, given that the source and receiver move relative to each other [3]. A physical theory that contradicts the law of conservation of energy leaves some questions unanswered.

[1] Pavan Kumar Aluri et al. *Is the Observable Universe Consistent with the Cosmological Principle?* arXiv:2207.05765v4 [astro-ph.CO] 27 Feb 2023

[2] J. Brandes, J. Czerniawski, L. Neidhart: *Special and General Theory of Relativity for physicists and philosophers* VRI: 2023, chapter 24.11.2, page 324.

[3] Article (during 2026) on homepage www.grt-li.de: *DPG-2025-2026-What was before the Big Bang.*

GR 10.3 Wed 16:15 Redoutensaal

Quantum gravity via Lorentz-invariant gravity — •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, paving the way to quantum gravity: Gravity in the form of gravitational time dilation slows down the frequency of the proper time of worldlines of massive particles, corresponding to the time evolution exp -imc2$\tau/\hbar$ of their respective wave functions. - More: Quantum gravity without trouble, Quantengravitation ohne Mühe, La gravité quantique sans peine.

GR 10.4 Wed 16:15 Redoutensaal

Constraining the Mass of Ultralight Axions Using the 21-cm Signal During Cosmic Dawn — •Julian Antonio Kleff — Institute for Astrophysics and Geophysics, University of Göttingen, Germany

The aim of my master's thesis is to constrain the mass of a dark matter candidate called ultralight axions (ULAs). Compared to standard cold dark matter ULAs suppress the halo mass function below the scale of the Jeans mass $M_J(m_\alpha)$ which depends on the mass m_α of ULAs. Star formation within molecular cooling halos is expected to significantly contribute to the 21-cm signal during cosmic dawn. Efficient molecular cooling, and thus star formation, becomes possible if the critical halo mass $M_{\rm mol}(v_{cb})$ is reached, which (among other quantities) is affected by the dark-matter-baryon relative velocity v_{cb} introduced after recombination. This dependence on v_{cb} leads to so called velocity acoustic oscillations (VAOs) in the 21-cm power spectrum on scales $k \sim 0.1$ Mpc^{-1}. However, once $M_J(m_\alpha) \gg M_{\rm mol}(v_{cb})$ the dependence of the 21-cm signal on v_{cb} is effectively removed, and thus the VAOs too. As $M_J(m_\alpha)$ increases with decreasing m_α, smoothly decreasing m_α leads to a smooth decline of the amplitude of the VAOs in the 21-cm power spectrum until they vanish completely. The goal of my master's thesis is to implement the physics of ULAs into the software Zeus21, an analytical tool for the computation of the 21-cm power spectrum, and to utilize the strong dependence of the VAOs on the axion mass to improve current constrains on the axion mass.

GR 10.5 Wed 16:15 Redoutensaal

New Description of the Big Bang's Approximate Volume and Density in the Universe — •Gh. Saleh — Saleh Research Centre, Amsterdam, Netherlands

In the analysis of an atom, a nucleus is observed at the centre, with electrons orbiting around it. For every element, a specific atomic radius exists, which is certainly a constant value. Essentially, a fixed "identity card" can be defined for each element, containing constant parameters such as volume, mass, density, and so on. Consider a white dwarf: it is defined as a structure composed of a collection of protons situated close together. This creates a relatively small sphere with a high density. Generally, since the material is made of protons, the density of a white dwarf can be estimated to fall within a specific range (around 10^17).

Essentially, this form of matter consists of protons gathered together. A problem arises when attempting to define the primary matter for the Big Bang. If the building blocks were protons or neutrons the result would be a sphere with a radius roughly the distance from the Earth to Jupiter. If the Big Bang is thought to be made of protons, neutrons, or even photons, it results in a massive sphere, which requires a different definition for the Big Bang. Therefore, based on the explanation above, a particle must be defined that is significantly smaller than a photon.

In this paper we are going to show that if photons are viewed as having a structure like an atom, breaking it down yields Cidtonium particles (between one-millionth and one-billionth the size of a photon). With the high density of Cidtonium, the huge mass and tiny volume of the Big Bang can be defined.

GR 10.6 Wed 16:15 Redoutensaal

Calibration and optimization of Target CTC ASICS for enhanced phase resolution in phase cameras — •Niklas Kotschi for the Einstein Telescope-Collaboration — Erlangen Centre for Astroparticle Physics (ECAP) Friedrich-Alexander-Universität Erlangen-Nürnberg Nikolaus-Fiebiger-Str. 2 91058 Erlangen

The Einstein Telescope is a planned gravitational wave observatory designed to detect spacetime distortions with unprecedented sensitivity. This can be achieved with a large michelson-interferometer setup.The laser needs to be well aligned to measure the phase. For this purpose, a new kind of phase camera, which uses an array of optical fibers to capture the laser was introduced. A cost efficient solution to digitize these multi-channel analog inputs are a new set of Application-Specific Integrated Circuits (ASICs), which were originally designed for the readout of signals from photosensors in cameras of Imaging Atmospheric Cherenkov Telescopes for ground-based gamma-ray astronomy. They were optimized for single photon detection. For phase cameras these

ASICs need to be optimized for readout of high intensity waveforms. This is why calibration and optimization of TARGET CTC ASICs for application in phase camera systems is important. The resolution is integration time dependent. Therefore reducing the sample speed can increase the resolution by increasing the integration time. Jitter from different GPS clocks was analyzed to optimize the synchronisation stability. The results demonstrate key improvements in data acquisition stability. Testing out different calibration and timing parameters and their impact on the waveforms and phase resolution were done.

GR 10.7 Wed 16:15 Redoutensaal

Visualization of the curved spacetime of a Morris-Thorn wormhole in a sector model — •Rahel Gabriel — Universität Hildesheim

Sector models, based on Regge calculus, provide an intuitive way to visualize curved spacetimes in general relativity using locally flat sectors. Curvature is encoded at sector boundaries through deficit or excess angles, and geodesics are constructed as straight lines that continue across sector boundaries. This framework is used to explore the topology and phenomenology of hypothetical Morris-Thorn wormholes in an interactive simulation.

GR 10.8 Wed 16:15 Redoutensaal

Probing Small-Scale Structure during Cosmic Dawn with the 21 cm Forest — •Monja Begau, Mihir Kulkarni, and Jens Niemeyer — Institute for Astrophysics and Geophysics, Göttingen, Germany

Observations of the 21 cm hyperfine transition of neutral hydrogen are expected to significantly improve our understanding of the thermal and structural evolution of the intergalactic medium during cosmic dawn. The 21 cm signal measures deviations of the hydrogen spin temperature from the cosmic microwave background, leading to absorption or emission. In addition to large-scale brightness-temperature fluctuations, neutral hydrogen along individual lines of sight can imprint narrow absorption features in the spectra of distant radio-loud sources. In analogy to the Lyman-α forest, this is referred to as the 21 cm forest. These absorption features probe small-scale density structure.

Modelling the 21 cm signal is challenging due to the nonlinear and nonlocal relation between matter density, star formation, and the resulting radiative backgrounds. In this work, we employ and extend the Zeus21 framework (arXiv:2302.08506v2, Julian B Munoz), an analytic model for the 21 cm signal during cosmic dawn.This framework is applied here to the description of the 21 cm forest. Since axion dark matter can modify structure formation on small scales, such effects may be reflected in the statistics of the 21 cm forest. We explore the potential of this approach to probe axion-like dark-matter scenarios through modifications of the predicted 21 cm forest power spectrum.

GR 10.9 Wed 16:15 Redoutensaal

Bondi mass loss formula for axial symmetric systems in $f(R) = R + \lambda R^2$ gravity — •Thomas Guillermo Albers Raviola — Universität Bremen, Bremen, Germany

In General Relativity, the Bondi-Sachs formalism is used to study gravitational waves as observed at future null-infinity. It introduces the concept of the Bondi mass, whose decrease is connected to the the news tensor through the famous Bondi mass loss formula. This work investigates the changes in the Bondi mass loss formula for axial symmetric systems in $f(R) = R + \lambda R^2$ gravity, also known as the Starobinsky inflation model. We develop this result in the scalar-tensor representation as a foundation for later applying similar methods for more general scalar-tensor theories of gravity. A priori, it is expected that the addition of further degrees of freedom shall provide a measurable signature, that may manifests itself, for example, in gravitational waves observations. Also closely related to the Bondi-Sachs results is the BMS group, which plays an important role in the search for a quantum theory of gravity. As such, it is highly interesting to understand the modifications to the BMS group in theories of gravity beyond general relativity.

GR 10.10 Wed 16:15 Redoutensaal

Universe without expansion and big bang — •Roland Alfred Sprenger — Herford, Germany

The standard model of cosmology is confronted with a model of a universe which is curved within a five-dimensional spacetime. The redshift of the spectra of galaxies is explained by the curvature; the expansion of the universe and the big bang do not exist in this model. According to this the universe is a four-dimensional hypersphere within the five-dimensional spacetime. Its radius is calculated from the distance of standard candles.

GR 10.11 Wed 16:15 Redoutensaal

Electron Mass, Charge and Sommerfeld FSC — •Manfred Geilhaupt — Hs Niederrhein Mönchengladbach

Einstein: Ich wüsste gern, was ein Elektron ist. Electron restmass (energy) not zero. Charge Sommerfeld:

**e^2=2*alphah*c*eps0 (no energy!). Question: What must be known else, able to answer Einsteins question? Restmass & Charge must be derived from a principle theory. Results from GR+TD: restmass me(alpha,N) & charge e(alpha). expectation values, both depend on alpha. The r(t)-generating two differential equations - not like Schrödinger but source for mass and charge - can be found using a common Newton Einstein Equation of Motion:

**dP/dt=f1+f2+f3+f4+f5 coming up with 5 internal parts from partial derivation. The second part (f2= m*ddr/ddt) leads to restmass me(alpha,N) being an effective value from the solution m(t) if r(t) is a generating function same for all 5 parts. u(t) is a unit vector possible to rotate (du/dt). The first equation (f1=dr/dt*dm/dt) - if m(t) is known already from part two - leads to charge e(alpha) while alpha is the Sommerfeld FSC:

**alpha=(1/beta)*(1/beta)*1/g44*3/4(1+log(1/3))*(1+log(1/3)) - appears when using r(t) to get m(t) from equation f2. Beta is the Einstein SR parameter while g44 is the well known GR-metric number: while within (e/m)=..1/sqrt(N) here alpha cancels! alpha represents the continuum part and N the quantum part of nature. So GR+TD predicts QMs quantisation phenomena physically - based on causality and TD principles applied.

GR 10.12 Wed 16:15 Redoutensaal

Dimensional Physics explains the structure of the natural constants c, G, and h solely based on General Relativity — •Christian Kosmak — Working Group Dimensional Physics, Würzburg

In the theory of Dimensional Physics, the approach taken is that spacetime density is the source of spacetime curvature. Any mass-energy equivalent is a direct geometric representation in spacetime itself. This gives spacetime boundaries in a higher-dimensional spacetime and in an infinite number of lower-dimensional spacetimes. These boundaries determine the structure of the natural constants c, G, and h. Planck's quantum of action and, as a result, the Compton wavelength of any object (spacetime density) are necessarily derived from the structure of spacetime. This means that General Relativity dictates how Quantum Field Theory must be structured. Spacetime is not only a dynamic stage, but also the only actor. Website: Dimensionale Physik (dimensionale-physik.de)

GR 10.13 Wed 16:15 Redoutensaal

Why the theories of relativity are wrong though they are right — •Hans Deyssenroth — Holzgasse 28

The two theories of relativity have been confirmed experimentally many times, most recently in spectacular fashion with the verification of the predicted gravitational waves. They must be right.

But unfortunately, the data of the lunar laser ranging project shows clearly that the photons, coming from a mirror on the Moon, appear there where the Earth was 2.55 seconds before and not - as expected - in the detector next to the laser. That means that there is no oblique light path at the light clock or from the half transparent mirror at the Michelson Morley experiment. Therefore, the time dilation cannot be derived via the Pythagoras form this oblique light path as Einstein it did and the length contraction proposed by H. Lorentz would destroy the null result. With other words: the fundament of both theories of relativity - the Lorentz transformation - is wrong.

Physics should be based on experimental facts. But can physicists accept an experimental fact that contradicts the theories of relativity?

Some other experiments and observations show that gravity can be shielded and controlled by electromagnetic processes. Why have these facts been ignored?

GR 10.14 Wed 16:15 Redoutensaal

A modified theory of gravity explains the self-interaction of dark matter. — •Albrecht Giese — Taxusweg 15, 22605 Hamburg

New investigations using the James Webb telescope have revealed inconsistencies in the explanations for the formation and distribution of

dwarf galaxies in the early stages of the universe.

Current cosmological theory suggests that this can be explained by assuming that dark matter particles self-interact. However, according to our current understanding of gravity, such an interaction is impossible.

We will demonstrate that there is a model of gravity based on a different dependence of gravity on mass. This model not only solves the issue of rotation curves, but also that of the self-interaction of dark matter-related particles.

For details: www.ag-physics.org/gravity

GR 10.15 Wed 16:15 Redoutensaal

CPU - the Cyclic Process Universe — •Thomas Wäscher — IBW-Engineering, 69231 Rauenberg

Based on my 2022 and 2024 talks which take the fundament of GR, Einstein's equivalence principle into account, it was shown that the accelerated expansion a=Hc can be equivalently interpreted as a constant isotropic gravitational field, now replacing Dark Matter and eliminating Dark Energy simultaneously. The redshift z of any radiation originates from accumulating the gravity potential Φ=f(R) with Φmax=c^2. The tailored Hubble number H [km/sMpc] of expansion changes to a natural decay constant [1/s]. The dynamic of expansion is converted to the equilibrium dynamic of in- and outflow of matter and energy by the ubiquitous astrophysical objects like e.g. stars, galaxies, quasars, blazars, pulsars and black-holes. The total mass and energy flows sum up to dm/dt=c^3/2G [kg/s] and P=c^5/2G [Watt]. The curved and gravitationally closed universe exhibits a volume of V=2π^2R^3 (Einstein 1917), the same as a horn torus with r=R, a possible topology. This universe allows any individual to be located in the very center by physical justification.

GR 10.16 Wed 16:15 Redoutensaal

Adequate Coordinate System for Space Navigation and Relativity — •Hans-Otto Carmesin — Univ. Bremen, FB 1, Postfach 330440, 28334 Bremen — Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — Gymn. Athenaeum, Harsefelder Straße 40, 21680 Stade

The International Astronomical Union (IAU) realized, that the coordinate systems of relativity theory are insufficient for space navigation. Therefore, the IAU proclaimed the problem of finding an adequate coordinate system (ACS) for space navigation and relativity.

Here, that problem is solved:

(1) A measurement procedure is presented. (2) For each Point P in the universe, an ACS is derived, and its velocity $\vec{v}_{ACS,CS}$ relative to an arbitrary coordinate system (CS) is derived. (3) The ACS is confirmed by an observation at Earth, using two atomic clocks, one at the PTB and one at the MPQ (Max Planck Institute for Quantum Optics). (4) The universal zero of the fractional kinematic time difference $\delta t_{kin,fractional}$ is derived. (5) For each Point P, $\delta t_{kin,fractional}$ is derived. This is confirmed by observation data at Galileo satellites. As a consequence, the precision of clocks onboard spacecrafts can be improved. This can provide improvements in space navigation, remote sensing or geoinformatics.

Carmesin, H.-O. (2025): On the Dynamics of Time, Space and Quanta. Berlin: Verlag Dr. Köster. Carmesin, H.-O. (2025): Construction of a Physically Adequate Coordinate System with Help of an Observation on Earth's Ground. J Geosci Earth Planet Syst, 1(1), pp. 01-12.

GR 10.17 Wed 16:15 Redoutensaal

Zeitentwicklung der dunklen Energiedichte und der universellen Zeitdilatation — Hans-Otto Carmesin[1,2,3] und •Jacky David Yang[1] — [1]Universität Bremen, Fachbereich 1, Postfach 330440, 28334 Bremen — [2]Studienseminar Stade, Bahnhofstr. 5, 21682 Stade — [3]Gymnasium Athenaeum, Harsefelder Straße 40, 21680 Stade

Untersucht wurden das globale Konzept und der globale Verlauf der Zeit. Für ein homogenes Universum (ΛCDM-Modell) und ein heterogenes Universum (Linear Growth Theory, Carmesin 2024) wurde mithilfe kosmologischer Planck-Messdaten (2020) das Weltalter bestimmt, wobei die Hubble-Tension berücksichtigt wurde. Aus der Zeitentwicklung des homogenen Universums wurde die im heterogenen Universum hergeleitet. Daraus wird die Zeitdilatation bestimmt. Die Ergebnisse wurden grafisch, tabellarisch und mathematisch dargestellt. Auch wird nun die Zeitentwicklung der Dunklen Energie Ω_Λ analysiert und veranschaulicht. Diese kann aus der Zeitentwicklung der globalen/universellen Zeitdilatation berechnet werden. Dabei sagen die von uns hergeleiteten Ergebnisse zukünftige Messwerte vorher und stimmen schon jetzt mit aktuellen Messwerten überein. Hierbei können sich zukünftige Messwerte auf beliebige Rotverschiebungen und entsprechende Zeitpunkte beziehen, da die Dunkle Energie und die globale Zeitdilatation als Funktion der Rotverschiebung hergeleitet wurden.

Planck Collaboration 2020: Astronomy and Astrophysics, pp. 1 - 73. H. - O. Carmesin (2024), Verlag Dr. Köster. H. - O. Carmesin (2025), Verlag Dr. Köster.

GR 10.18 Wed 16:15 Redoutensaal

A Concept of Worldview — •Boris Schapiro — Kluck Str. 25, D-10785 Berlin

The concept of worldview consists of several hypotheses:

The Space-Time is quantum object. The world consists of several universes. Number of universes and dimensionality of world are related by combinatorics. All universes originated simultaneously and are approximately the same as our own. I call the space in which the universes are located a Metaverse. The Metaverse is also a quantum object. Energy within it shouldn't be conserved because it's an open system; it generates energy through quantum fluctuations and expands due to this energy. Universes expand because they're nested within the Metaverse. Dark matter is the matter of other universes as it is gravitationally perceptible by us.

This leads to the fact that space is a quantum object, while gravity is the curvature of space, which isn't a quantum object, but a classical one. Therefore, there is no need to search for a "theory of quantum gravity", but rather to combine quantum and classical phenomena without merging them into one illogical concept, without distorting the understanding of the fundamental nature of each of them.

Comparison of the obtained formulae with the known observational data allows us to conclude that there are six universes in the Metaverse.