



MINT Wigris Library

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In discussing the Planck era, scientists from physics say: Before a time classified as a Planck time, 10^{-43} seconds, all of the four fundamental forces are presumed to have been unified into one force. All matter, energy, space and time are presumed to have exploded outward from the original singularity. Nothing is known of this period.

Keywords: Color Charge; Measure; Octonions

MINT Wigris theory [1,2] has made a theoretical model for this, using mathematics and technical designed tools. They are available in the library. The Planck era is described, using the libraries documentations. Until 2023 physics has no solution of this kind; neither the postulated singularity is theoretical modeled nor a model for nucleons exists. There is no unification postulated for forces as physics claims. Biology has Darwin, chemistry the periodic system for the evolution of their theories. The MINT Wigris evolution follows this view in the Planck era.

Planck era

The W-bosons Heegard decompositions, for instance of the Hopf S^3 unit sphere into two solid tori can be taken for linked dark matter and dark energy. Dark energy has a pinched torus as surface. This is geometrically observed as a cylinder on which light is expanding with the use of an exponential function. At projective infinity the parallel lines on the cylinder are closed by a point. If this point is in space, not at infinity, it is observed for the Minkowski cone. The cone is closed at infinity by a circle and forms a pinched torus.

According to astronomy, dark energy DE assumes most energy in the today's universe. Since for light full windings about the cylinder surface are needed for the helix expansion of its energy on the

cylinder surface, it is assumed that inside the pinched torus this energy has the same geometry, a finite interval d which can also be curved. Its momentum speed v' is higher than speed of light c . Inversion is for speeds v in the universe by $v'v = c^2$. The potential energy for d arises from the inverted ψ waves exponential \exp function. This is a logarithmic log surface inside DE on which d jumps using the arcus of the log function.

Dark matter is the second large energy in the today's universe. The view for this is that the radius of mass systems is inverted, keeping mass unchanged. Listed is the Schwarzschild radius R_s of the dark matter 3- or 4-dimensional DM with a torus surface. The inversion is by $r'r = R_s^2$, $r' < R_s$ inside DM. Homology retracts of weak Heegard decompositions of universes systems are assumed for energy as 1-dimensional connected chains of circles. In use are the genus $n = 1, 2, 3, 4, 6$ and possibly 8. Higher n are not stable. Beside these, in the universe are listed barycenters for mass carrying systems. For the chains it can be a center in or on one of its circles where a mass scalar is added by Higgs. Also DM itself can have in its center a mass scalar attached. If its point location is blown up dimensional to a circle as a fiber, the mass at rest or as mass carrying point rotating on the circle occurs. Inverting the chains is not keeping the DM location for its mass. Geometrical it can be set differently in the universe. In particular for nucleons the dynami-

cal model for six states generate barycentric coordinates in the quark triangle where Higgs sets a huge mass scalar and quarks mass contributes only about 10 percent to this.

Beside these two basic forces, dark energy and matter, physics has for nucleons the weak and strong interaction. They are neither existing in DE nor DM and also not in a black hole BH as origin of universes energy content. BH replaces a singularity. The new kind of description has as model perspective projections. They have an origin from which rays are send out in an environment which can be a real R^n or complex C^n n -dimensional space. In different dimensions the rays are presented as points on a unit sphere. For $n = 0$ this is a point which can carry an energy charge such as mass, electrical or color charge. For $n = 1$ and R as line it is a dipole $S^0 = \{+1, -1\}$, setting vector orientations on a line, (energy) dipoles, Cooper pairs. For $n = 2$ it is a circle, also in the complex case ($n = 1$). For $n = 3$ it is a (complex Riemannian) sphere S^2 , complex $n = 2$ also as projective complex 2-dimensional space for nucleons with a bounding surface S^2 . For $n = 4$ it is a Hopf sphere S^5 in real spacetime. For $n = 6$ it is a sphere S^5 of the $SU(3)$ strong interaction SI geometry. It is used for a fiber bundle with fiber S^1 having as base the CP^2 of nucleons. In other theories authors identify in projective Hilbert spaces lines through an origin with a point, here on a unit sphere antipods are identified. Symmetry breaking is R^6 projective normed to P^5 , a Kaluza-Klein space for the unified electromagnetic EM and gravity GR force [3]. According to this theory, a projector splits this space into an EM and GR 4-dimensional space and a scalar third 4-dimensional space. It is necessary to make a dimensional extension of quaternionic spacetime R^4 or C^2 to octonions to accommodate all 4-dimensional spaces. The octonion coordinates are listed by indices, also in sequences for subspaces 0,1,...,7. Spacetime is 1234, nucleons 2356, EM 1456, GR 1256. Projections of the new 4-dimensional spaces can be observed in physics 1234 spacetime.

Observe that including P^5 as geometry, all P^n , $n = 0,1,2,3,4$ are available. For setting charges is $n = 0$; for fibers and circles $n = 1$; for an Einstein mass/frequency plane $n = 2$, also for color charge locations and for flat orbits of (rotating) systems; $n = 3$ sets many projective normal forms as surfaces for systems or for metrical quadrics (bilinear forms). Observe that physics has not adopted the Kaluza-Klein construction for a unification of forces. For possible states of a system such as a nucleon the old quantum mechanical axioms are revised. No countable infinite real or complex Hilbert space is needed. Octonions and its subspaces are sufficient

for this. MINT Wigris postulates are not listed in a sequence, but as an evolution in the next parts of this article. In a P^5 normed S^5 is generated a driving POT (potential) force, Kaluza-Klein unifying EM and GR.

Neither weak WI nor strong SI interactions or EMI the electromagnetic interaction are generated until now. Nucleons are not existing, photons can be generated when speed of light can be reached for escape. EMI is late generated in the universes evolution, not in the Planck era. A complex plane C or a Riemannian sphere S^2 is generated. Real numbers are 2×2 -matrix extended as $x \cdot id$, id identity matrix. The conjugation operator C of physics adds the 2×2 -matrix with first row $(0 \ 1)$ and second row $(-1 \ 0)$ for the imaginary iy coordinate of S^2 .

WI and EM have octonions spacetime 1234 and the Hopf geometry for its S^3 . It is newly generated and presented in DM as 4 circle retract 4M for a 4 roll mill potential. Extending 4M projective dimensional means that two motors (presenting forces) POT and WI each drive two rolls of the mill. POT drives an EM charge + mass 15, WI drives magnetic E_{magn} and kinetic E_{kin} (also momentum, linear speed) energies 46. The complex space C is extended to C^2 , the coordinates are listed in matrix form for transformations of vectors (first matrix row $(z_1 \ z_2)$, second row $(-c(z_2) \ c(z_1))$, $c(z)$ conjugate of $z = x + iy$). Spin of systems is generated, describing with its three space coordinates also the 3 weak bosons W^+ , W^- , Z^0 , having the Hopf S^3 as geometry in R^4 . There are three quaternionic Pauli matrices as symmetry $SU(2)$ generators. The weak 3-dimensional spin extension for systems of a circle in DM use a projective correlation, described after SI is generated.

SI arises in a Feigenbaum evolution of the universe with the QCD symmetry $SU(3)$ and 8 gluons as generators. That there are only 8, not 9 gluons, is due to the matrix extension from 2×2 -Pauli matrices to 3×3 -GellMann matrices by inserting a 0 entry row and column. The three third Pauli matrix extensions are linearly dependent and generate a plane, not a 3-dimensional space. The Feigenbaum evolution of energies (figure 1) is described in other articles of the author here is mentioned that from an octonion color charge force as input on the octonion coordinate 0 split 15, EM, GR mass from the Kaluza-Klein POT (Heisenberg uncertainties HU paired), 1 splits into 24 (2 heat, 4 E_{magn}), 5 splits (energy preservation theorem) into 36 (E_{rot} rotational energy, E_{kin}). Each energy 2,3,4,6 splits into two gluons, SI is generated. Its geometry is $S^3 \times S^5$. After that heat chaos

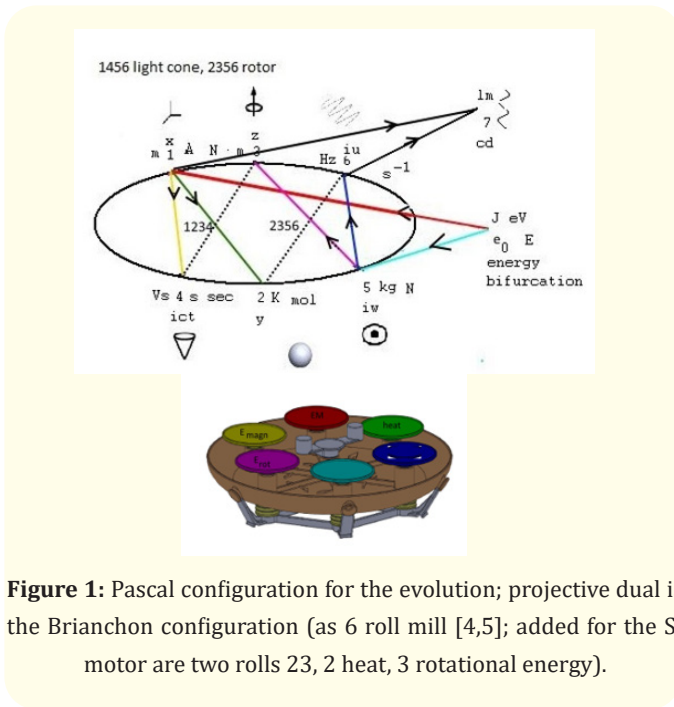


Figure 1: Pascal configuration for the evolution; projective dual is the Brianchon configuration (as 6 roll mill [4,5]; added for the SI motor are two rolls 23, 2 heat, 3 rotational energy).

occurs with the inflation of space as postulated in astronomy. The two radius and speed inversions produce, as burning of energies, the big heat. Entropy in a volume expands 3-dimensional spaces volume exponential and the 123, xyz-space. The big heat generates volumes for physical systems with entropy inside.

The Feigenbaum bifurcation in figure 1 drawn on an ellipse has projective the Brianchon configuration for a G-compass. It has for six color charge cc segments on the compass disk; the compass needle turns discrete using the the six powers of the rotational 2x2-matrix G having the first row (1 -1), the second row (1 0); if properly scaled as complex cross ratio $(r - R_s)/r$ (r radius, R_s Schwarzschild radius of a mass system) it is the scaling factor for the Schwarzschild metric. The cc arise on a Riemannina sphere S^2 as invariants under its Moebius transformations MT. They are perspective projections. Geometical, as vectors drawn they generate in rotation a cone, similar to the magnetic momentums vector.

WI continued for the Pauli matrices quaternionic spacetime and spin: In the Hopf geometry, the three generated Pauli matrices define the map from S^3 to S^2 . The Pauli matrices are not commuting as (quaternionic) operators. The time coordinate in the real spacetime R^4 is Hopf normed for S^2 as subset of space R^3 . In projecting stereographic S^2 from its north pole down to a tangent plane in the

south pole also the third space coordinate z (third Pauli matrix) is deleted. The Hopf map lists the original $(z_2 = x + iy, z_1 = z + it)$ coordinates from R^4 , complex written, as $w = z_2/z_1$ for $z_1 \neq 0$, deleting $z_1 = 0$ as stereographic north pole ∞ of S^2 . The inverse Hopf map shows the north-south pole magnetic + spin vector as a rotating vector, leaning in a 45 degree angle towards the rotation axis for the concentric located tori. Macroscopic, the earth has also a leaning angle between its rotation and magnetic axis. The measuring 3-dimensional extensions for EM, in octonions as 145, for spin 123, are entangled, preserving an EM charge rotational orientation in the gyromagnetic relation for a parallel or antiparallel orientation of spin and magnetic momentum vectors. For neutral leptons magnetic momentum is replaced by momentum (helicity). Macroscopic 145 is related to the cross product definition of induction as angular momentum when a magnetic field transversally cuts an electrical loop as current. The loop rotates. Induction and magnetic momentum are related by a loops area integration/differentiation. The former 4M motor extends this to a 4-dimensional WI +EM weak bosons and leptons space 1456.

In DM are the circular homology retracts. Two complex written circles can hit orthogonal similar as in a Lissajous figure. The complex 2-vectors are extended to rows $(1 \ 1 \ 0)^{tr}$ and $(1 \ -1 \ 0)^{tr}$ 3-dimensional by adding a third coordinate 0 through the use of a projective correlation. The real cross product of them gives the vector $(0 \ 0 \ -2)^{tr}$ for the third space coordinate of the heat generated volume.

Generated weak bosons and their decay products are geometrical 3-dimensional systems in space. They can decay using Heegard decompositions of S^3 . The third generated dimension is orthogonal to the two tr vectors plane. Also in their plane, the determinant with the vectors as two rows is -2.

The Pauli matrices generated Hopf map: the first Hopf/Pauli matrices projected x-coordinate is for the complex dot product, the second y-coordinate for the complex cross product, the third z-coordinate lists two circles for the two complex coordinates, in a transforming 4x4-matrix with two (rotation) 2x2-matrix blocks A, B noted, having as first row (A 0), as second row (0 B).

Figure 2 two orthogonal hitting circular frequencies are presented as vectors and generate a circle as geometrical location; in the middle is the circular version on S^2 ; the xy-plane and xz-plane

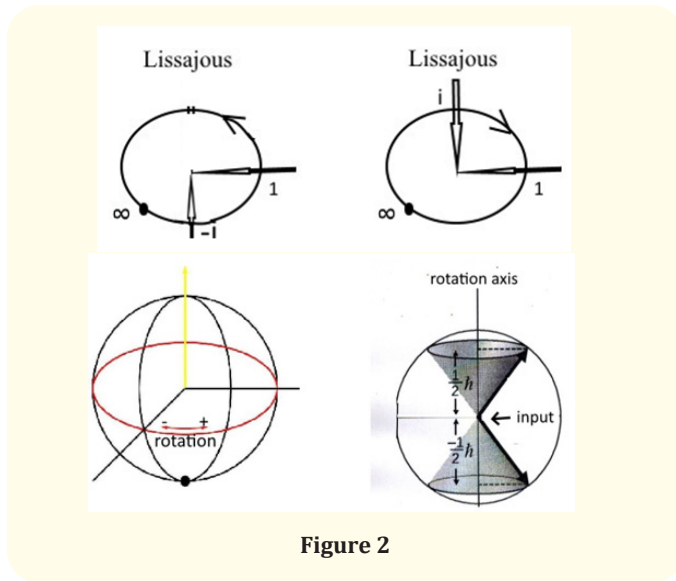


Figure 2

contain two orthogonal hitting circles on S^2 , the third circle for the 3-dimensional location on S^2 is generated; right figure Minkowski conic spin rotation.

Pauli listed a quantum spin related rotation (at right). Observe that the above Hopf projection rotation on S^2 cannot be related to the standard model in physics. It uses an optical computed (relativistic) speed due to a Minkowski metrical determined mass scaling for the electrons wave description. A special relativistic mass [6] rescaling is needed. Obtained is scaled the DE inverted speed v/c .

The inverse Hopf map has the fiber S^1 for the EM charge location which in rotation fills out a torus surface. These toroidal surfaces in S^3 retract 1-dimensional to a central (possibly Schwarzschild) circle for the inverse location of the electrons mass. The rotation axis is through the tori vertical axis, the time and aligned magnetic momentum (or momentum for neutral leptons) has a 45 degree angle towards it and rotates like a vector on a cone surface. Quotation from Wikipedia: Spin...seems to follow some of the laws of angular momentum, but not all of them. A „spinning“ electron (or any other sub-atomic particle with spin) can only have certain values of angular momentum.

The spin orientation can assume in space (Stern-Gerlach experiment, only two possible spin up or down values are measured, $+h/4\pi$ or $-h/4\pi$ on one coordinate axis (figure 2 at right); prepared is an orthogonal 90 degree input jet. The spacial $s = (s_x, s_y, s_z)$ spin

coordinates arise from a measuring GF later on. In preparing for an experiment the spin orientation, one of the space vectors is chosen. In the experiment it is blocked and the systems can only change the spin direction orthogonal on another GF space coordinate. The + or - up/down projection is stochastically chosen (Figure 2 right).

Until now, generated in an evolution are EM,GR, SI, WI. Rescalings of energies measuring units are needed. Mass rescaling needs the special relativistic factor (Figure 3). Planck has computed the Planck units with the universal four constants c speed of light, G gravitational constant, h Planck constant, k for temperature (Kelvin). Basic units are for length, time, energy, mass, temperature, density, derived units are for instance acceleration, force, momentum. They are not rescaled.

Rescalings are for measuring GF base triples as follows. Homology retracts of Heegard decompositions are assumed for energy as 1-dimensional connected chains of circles inside a DM. In their 3-dimensional correlation blow up from a decaying DM, DE black hole BH are obtained for the blown up inner 1-dimensional systems, measuring Gleason operators having a spin-like base 3-dimensional frame GF: Three real or complex scalaring units are added to the base vectors. The original basic GF units can be projective multiplied by and constant of absolute value 1. This is newly scaled for renormings of units, also in (pseudo-)metrics. Higgs sets other mass values at barycenters of systems P.

A kg GF 257 for measuring mass of P exists, similar as the spin length 123 GF. 257 sets six mass values for the fermionic series, quarks and leptons. The orthogonal change of a spin direction can be observed for the kg GF and neutral leptons as their oscillation. Expanding on their world line requires for their momentums HU that the observable neutron mass changes orthogonal in time to the other two (neutral) vectorial GF masses and back.

For Minkowski rescalings the exponential function $\exp(i\varphi) = \cos \varphi + i \sin \varphi$ is used which sets an angle between two rays having a common initial point. The computed or new (not GF) units are either on a horizontal drawn ray or the second ray in a counterclockwise drawn angle φ (Figure 3).

The speed inversion for BH was $v'v = c^2$, $v/c = c/v'$. The value $\sin \varphi = v/c$ is used for the relativistic factor $\cos \varphi$ which rescales the original units in an orthogonal projection. Mass is increased m'

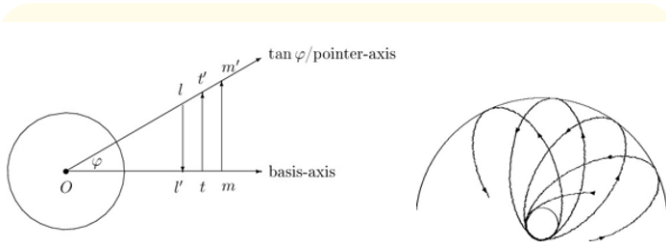


Figure 3: Minkowski watch, rosette orbit at right.

$= m/(\cos \varphi)$, Minkowski metric is in reduced radius r time t coordinates $ds^2 = dr^2 - c^2 dt^2$. See also figure 2 a right for the Minkowski cone. The BH radius inversion was $r'r = R_s^2$, $R_s/r = r'/R_s$. The former v/c factor is replaced by $\sin^2 \beta = R_s/r$. As a gravitational acceleration, not the coordinates but their differentials in the tangent plane are rescaled, keeping $dr \cdot dt = dr' \cdot dt'$ constant. The Schwarzschild metric is $ds^2 = dr^2/\cos^2 \beta - \cos^2 \beta \cdot c^2 dt^2$. In Planck units, acceleration $c/t_p = \sqrt{2\pi c^7/hG}$ has as factor $h/(2\pi c^2)$ for (at speed c) momentum $h/(2\pi l_p) = \sqrt{hc^3/(2\pi G)}$; the factor h/c^2 transforms mass into frequency (kinetic energy) in the Einstein formula $mc^2 = hf$. The acceleration includes nonlinear (general relativity) that the original Kepler ellipse for an orbiting planet about a central sun gets after one revolution a periodical repeated angle added for its rosette motion about the sun. The Minkowski constant $\alpha = \varphi$ is replaced by a radius dependent (potential) parameter $\alpha = \beta$ in figure 3 at left. The energy momentum tensor of Einstein for a Riemannian curved manifold with singularity is needed for computing the Schwarzschild metric in spacetime coordinates 1234.

In other articles of the author, the Gleason theory for the above mentioned GF can be read. Here is mentioned that the Kaluz-Klein P^5 space allows the 3-dimensional blow up of the 1-dimensional chains in DM by using correlations Q . A point is blown up by Q to a 4-dimensional space (spacetime). The coordinates $0,1,\dots, 7$ for the GF are from octonions, doubling the quaternion 4-dimensional space. The quaternionic doubling of complex coordinates was attributed to spins not commuting Pauli matrices of the $SU(2)$ symmetry. For the octonions doubling the complex Riemannian sphere is quoted with cross ratio invariants of its Moebius transformation symmetry. Generating cross ratios, a complex coordinate z and three reference points on a circle are needed. There are two choices for the reference points $0, \infty$ and $+1$ for the above G -compass matrix and $0, \infty$ and -1 for a nucleons dynamics with the inner quark triangle D_3 symmetry. This uses not 1234 spacetime coordinates, but 2356 octonion coordinates where 14 is replaced

by the Einstein energy plane 56 for mass/frequency. The first complex cross product of spacetime extension 1234 is by 56, an energy plane is added for 123456. In a second complex cross product extension. Two 07 octonion coordinates are related to an input energy 0 as independent color charge force for the former evolution of energies and after EMI is generated an output octonion coordinate 7 is added for the EMI symmetry $U(1)$, a circle and the cylinder geometry for light, expanding in time on a helix line of the cylinder. The helix is the universal cover of the circle, arising also in the Kaluza-Klein geometry [7,8] and as fiber S^1 of two fiber bundles for S^3, S^5 . Redshift and double lensing of light is explained in other articles of the MINT Wigris theory. This needs the angular braking of the cylinder axis in another direction with frequency energy of the light emitted or absorbed.

For an octonion EM subspace was listed 1456, for EMI it is 1567, extending the GF 167 by relativistic mass 5. For the related gravity is mentioned that as waves LIGO has detected them through their action of stretching/squeezing spacetime coordinates, as particles they are not found up to 2023. A model exists for them in the MINT Wigris library.

Octonion subspaces are listed by a sequence of coordinate indi-



Figure 4: Tool Box in the library.

ces. The energies of the Feigenbaum evolution have 1 EM charge, 2 heat, 3 rotation, 5 mass, 6 kinetic energy. The associated GF are (1,123), (2,246), (3,347), (4,145), (5,257), (6,356), EMI has (7,167). The SI GF-triples are 126 (rgb-gravitons), 345 (dual graviton); 037 is for color charges as an independent force. The associated color charges are presented as six cross ratios of the Riemannian sphere, as invariants under Moebius transformations. The setting of rgb-

gravitons means that they are superpositions of three color charge conic whirls r red, g green, b blue, observed as neutral color charge of nucleons. The GF should be studied, also for macroscopic systems. This is a technical oriented research project. The MINT Wigris Library [9] has 15 models, as tools available which demonstrate the theory. There are some videos for dynamical systems and many figures from geometry.

Conclusions

This list describes how the basic four interactions of physics arise. The former physics comment from the internet is revised. There is no unification of four basic forces, two WI, SI are newly generated when nucleons can be formed. Kaluza-Klein geometry introduces EM, GR. Present in DM is mass and Lissajous retracts for energy systems in the universe as (homology) chains of circles and local barycenters. DE presents frequencies in linear or rotational form, including oscillations. Light, EMI, is much later generated in the universes development, not in the Planck era, as an own interaction. The early universe is dark. Stars cannot exist in or before the inflation period of the universe.

In the former list, DM, DE, postulated by astronomy, are described by tori surfaces, having inside 1-dimensional energy carriers. The universe contains them projective 3-dimensional blown up. In part 2 the systems ray presentation by unit spheres is found. Part 4 (part 5) describes how the strong (weak) interaction is generated. Before that is mentioned that the EM and gravity forces get generated by the use of the Kaluza-Klein theory. Part 6 is devoted to recsalings of measuring units and metrics. In part 7 a research project is proposed for the 3-dimensional systems and their spin-like Gleason frames. The quaternionic space needs for this the doubling of coordinates to octonions.

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