Available online at http://www.journalijdr.com

IJDR

ISSN: 2230-9926

International Journal of Development Research
Vol. 09, Issue, 11, pp. 31837-31841, November, 2019

RESEARCH ARTICLE OPEN ACCESS

MAKE YOUR DESIGN AND BUILDING

***Gudrun Kalmbach H.E.**

Mathematics Professor, Inventor of MINT (Mathematic Informatics Naturewissenchaften, Technic), Germany

ARTICLE INFO

Article History:
Received 07th August, 2019
Received in revised form
19th September, 2019
Accepted 26th October, 2019
Published online 30th November, 2019

Key Words:

Gleason measurements,
Moebius transformations,
Riemannian sphere.

ABSTRACT

In this article it is pointed out that physics has to use more than one space for describing its systems. The strong interaction needs for gluons matrices 8 dimensions. The geometry is a toroidal product from a 3- with a 5-dimensional sphere. The multiplication table is different from the octonians which serve for the spin-like triples of quasiparticles and for Gleason measurements. The weak interaction has the Heegard decays for particles which are best described by dihedrals. Gravity is best described using the Moebius transformations on a Riemannian sphere. Projective geoemtry is added to this. This shows that different kinds of geometry, different dimensions, different symmetries have in 2019 to be considered for describing the modern experimental findings of physics.

Citation: Gudrun Kalmbach H.E. 2019. "Make your design and building", *International Journal of Development Research*, 09, (11), 31837-31841.

INTRODUCTION

For a new building an architect makes a design and for the construction a flow chart shows how to organize its construction. A first design for a building in which physical systems P can live is to count the necessary rooms and purpose for what they are used. Look first at the octonian building in the Fano memo design. Eight rooms are needed for the coordinates. The purpose of the first octonian coordinate e0 is to set somewhere in the octonian building a vector which sets an initial point for a vector, draws an interval whose length is often a scalar, a real number added as weight to a measuring unit and a direction in which the vector can act. The octonian e1 coordinate is getting a vector for electrical charge as weight, measured in As (ampere second). A second use of the vector is to measure length or distances in space (meter), also in subspaces of the octonians. In figure 1 the Euclidean linear subspace with the three spin coordinates s = (sx,sy,sz) is added. This subspace named 123 is one of the seven projective Fano lines. In a perspective drawing on paper the three pairwise orthogonal x, y, z space coordinates are shown and the direction on every line is chosen in drawing from a center a short interval on the line. The 1-dimensional e1 room is blown up to a 3-dimensionsional space this way. When e0 sets all this for the room e2, a spherical volume replaces the 3-dimensional linear space, a solid ball is the geometrical shape for this. In it chemistry measures in mol the material kept in it. The electrical energy is replaced by heat, an entropy is measured in the volume (kelvin K as unit). The room e3 has a measure Nm for rotations.

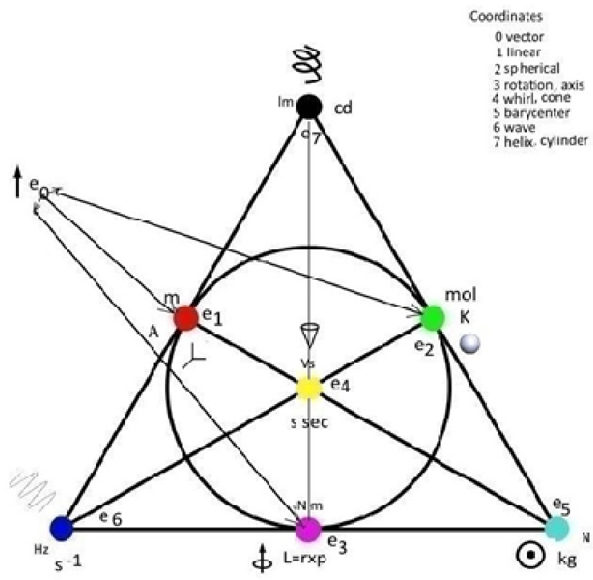

Figure 1. Fano memo

The shape for rotation is chosen by drawing a rotation axis and an orthogonal circle as orbit on which a system p can rotate about the axis. The angular momentum is attached to the design as L = rxp, r is the radius of the circle, p is the momentum of P. This kind of triples use the subspace notation of e1: in space the vectors for L, p, r are pairwise orthogonal. For the other four octonian coordinates e0 does the same.It is not directly noted in this flow chart. The reader has to follow up another design which is in the sense of a Feigenbaum evolution. In figure 2 e0 is bifurcating into 1 (the former e1) and 5 which is in figure 2 on the line 145. It measures mass in kg or N and has the shape of a barycenter at which the mass is sitting and a equipotential circle drawn for its field strength. This is acting in space also 3-dimensional, as noted for e1 and e2 above.

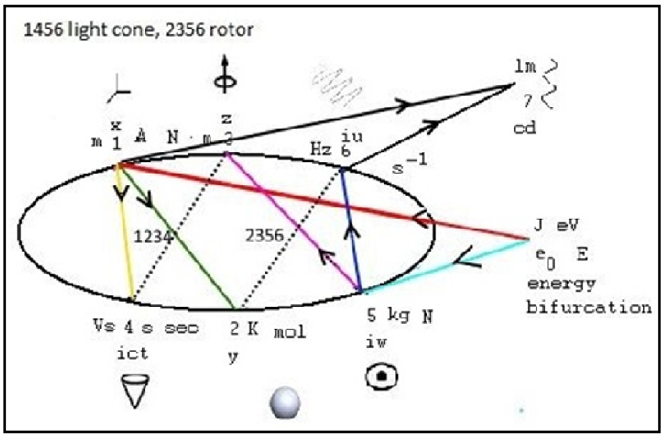

Figure 2. Energy bifurcation

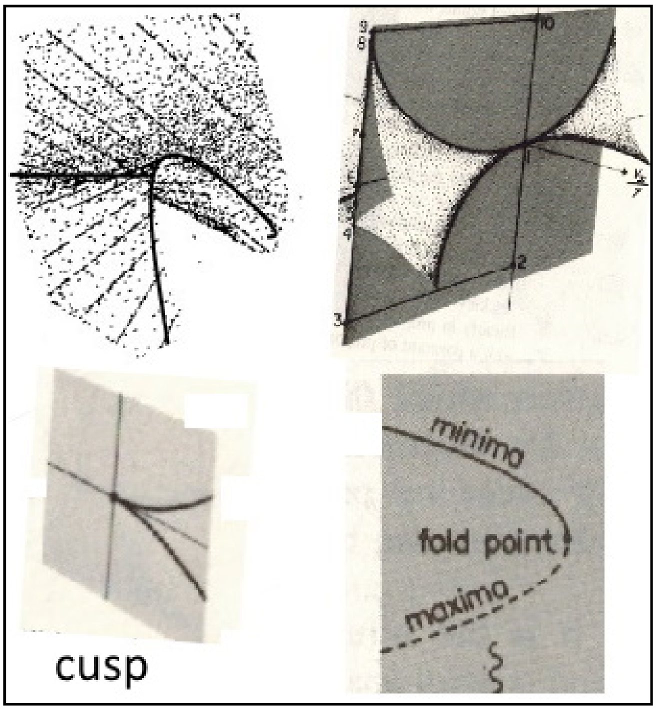

Figure 3. Cusps for bifurcation

The e1 bifurcation is into e2, e4. The quasiparticle wrinklon sets suc bifurcations whihc appear in catastrophe theory geometrically in form of cusps for catastrophes where from a singular point a 2 sheeted membran fold appears and is projected down to a bifurcating cusp (Figure 10). The coordinate 4 is for time (measure second) and carries the magnetic force (measure Vs). Drawn is a cone for the shape of a magnetic field quantum. It has a heisenberg coupling with electrical charge in $\Phi 0 = h/2eo$, h the Planck constant. It is better to build adjacent 14 rooms since they come always together and have as third (spin like triple) compagnion induction. Inducton however cannot be put on e5. The octonian line 145 serves for another purpose. Also time t is often listed complex imaginary as ict, c speed of light. When e1 is measured as radius then the spacetime metric uses the projective correlation quadric $r^2-c^2t^2 = 0$ for getting Minkowki metric in the differential form $ds^2 = dr^2 - c^2dt^2$. As projective quadric the shape consits of two intersecting lines r-ct = 0, r+ct = 0. Projective extensions for subspaces arise by adding one additional coordinate for norming as used in computer graphics The coordinates are then [r,t,w] on the 145 line. Norming w =1 is for the Minkowski metric in the rt-plane. Added is a circle w = 0 on which a stereographic point ∞ with w = 0 = t or w = 0 = r is sitting. Without this point the line [r,1,1] or [1,t,1] is obtained by a stereographic projection of the circle from ∞ to this line. Such lines at infinity can be located differently in this projective plane by using projective transformations. It is mentioned that also spin s = (sx,sy,sz) makes in octonians such a projective space extension. In the spin case the vector s is sitting on a Moebius strip in a projective plane P^2. When it rotates by 360 degrees around acircle, its location changes from an up to a down oriented vector. This is called nonorientable for a surface like P^2. Spheres S^2 in space are orientable. 0,1,2,3,4 indicate rotations by 180 degrees (π).

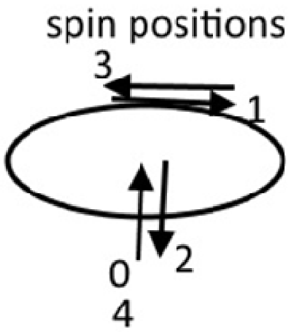

Figure 4. Quasiparticles can change their attached spin like vector from up to down this way, they are generated by the decay of dark energy and transport energy and momentum

The room e6 (e5 is bifuracting into e3, e6) is for frequency f = 1/ Δt as inverse time interval. In its linear form it expands its frequency energy (measure Hz or inverse second s) on a cylindrical helix line. It is quatized by E = hf, h the Planck constant. An energy quant has the measure h. No smaller values exist. In the shape of a helix this is described by one winding in a time expansion along the cylinder. Energy is not stored on unclosed circles as projection itno a diameter of a circle. Full windings n are storing energy.This counts also for quasiparticles energy. Spin for instanc can only have normed discrete length as multiples n of ½ or 1. Frequencies arise also in rotational form as $\omega = 2\pi f$. When two frequencies hit orthogonal (figure 5 at left last figure Lissajous) $x= a\cdot\sin \omega t$, $y= a\cdot\sin(\omega t+\pi/2)$ a cirle $x^2 + y^2 = a^2$ as energy orbits shape is obtained. When the frequency proportions are 1:2 a central 1-dimensional lemniscate for the quarks energy location is obtained. Such radius inverted quark energies are strored in dark matter.

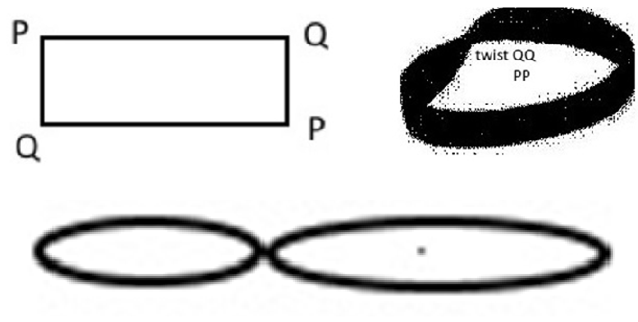

Figure 5. lemniscate, Minkowski light cone

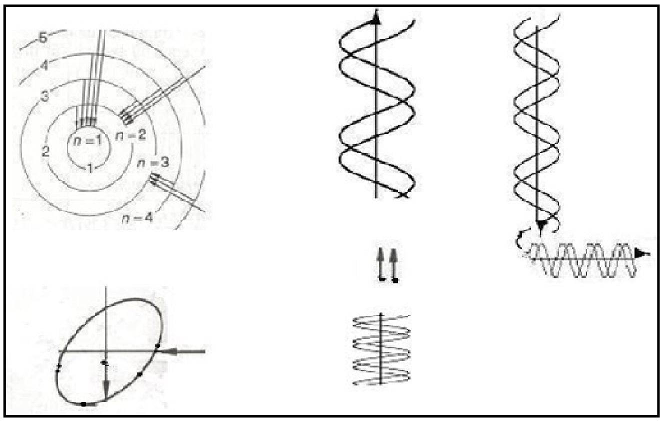

Figure 6. Light emitted from atoms (spectral series), differnet frequency helis or cosine projected curves, a Lissajous figure at lower left

The octonian coordinate for light EMI (eletromagnetic interaction) is e7. In figure 1 it is drawn at the top of the Fano triangle. Its line 167 as triple is for wave length λ on e1, for energy f on e6 with the equation λf = c. Its measure is lm or cd. In figure 2 it is shown as outpu from e1, e6 (spectral series). In figure 2 three 4-dimensional octonian subspaces are listed: 1234 for spacetime, 2356 is for atomic kernels. They sit in projection in spacetime as solid balls satisfying the Pauli principle while frequencies can sit in w ave packages at the same place in superposition. 1456 is for EMI. These waves can have relativistic mass on e5, λ on e1, f on e6 and their cylindrical axis as world line, and time on e4. The Fano memo and the energy bifurcation are the first two designs for a building in which physical systems can live. Make your own design. MINT-Wigris as a theory has many of them. Their description follows. Pseudoparticles decide to have an own building, not octonians. The octonian e0 vector is projective normed to 1. Visualizing this for spin: draw a 2-dimensional Riemannian surface for a ball inside. The physics parity operator P sets equivalence classes for lines in space through 0, This allows renormings of real coordinate unis as known from special relativity. On S^2 diametrically opposite points are identified for P^2 (figure 3). The old octonian coordinates are kept in the projective [e1,…,e7] coordinates of P□. It has other symmetries than a linear Euclidean space. Correlations can be used which dually exchange dimensions and metrical quadrics arise for world lines or shapes of systems. The 2-dimensional normal forms are all observed (point, line, two intersecting lines, circle, parabola, hyperbola,..) In figure 2 this is used to draw for the equivalence classes of octonian coordinates seven points and mark e0 as a source from where they are set. A scorrelation quadric for 6 points is draws a circle. They form a Pasal configuration whose intersecting diagonals have 3 points on a circles diameter.

They are marked as 4-dimensional spaces 1234 for space, electromagnetism, the weak ineraction, 1456 for an EMI space and 2356 for a strong interactions blown down space which joins with gravity. Gravity also joins with 1234 to a 5-dimensional field space. For this case in [12] a unified projective field for electrical and gravity potentials POT is described. Its blown down spaces use a projector which generates three 4-dimensional spaces. One is for 1234 and the electrical potential, another one for the gravity potential (1235 for instance which uses spherical coordinates for inertial mass) and a third scalar field which includes the 45 plane and norms one of the space coordinates to 1. The norming of 2 means that for rotation axes an angle towards the z-axis gets quantized measured through the roots of unity from z^n-1. The geomerical location for this are dihedrals with n points on a circle. Figure 2 is for n = 6, also used for the G-compass.

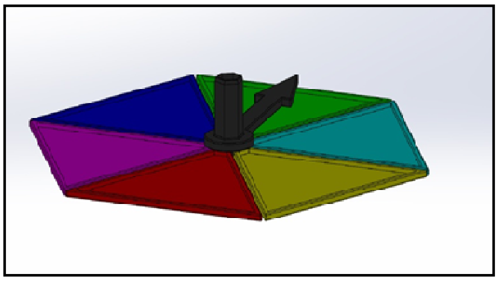

Figure 7 G-compass which sets as multivalued function 6-fold color charges, 6 electrical charges, 6 masses for the fermionic series, three kinds of cw (clockwise) or mpo oriented rotions for spin s, orbital axes L (angular momentum) and the sum J = s + L; for frequencies which include then time through f = 1/Δt there are for f running as a helix line in time on a cylinder either left-hand or right-hand screw orientations, the same for cw, mpo rotating angular frequency ω = 2πf and a third kind of two frequencies for dark energy and quasiparticles. In astronomy this can include the noise observed from the big bang. The quasiparticles for noise has another frequency: it measures through density excitations with solitons the change of pressure in media, spreading out in time as periodic phases.

Norming 3 means that the Pauli matrices are acting through an identity operator id and σ2 as the conjugation operator of physics C. These two present complex coordinates in form of matrices. C^2 = id is for setting the imaginary number i through the polynomial $z^2+1 = 0$. The Gaussian plane is a stereographic projections of S^2, deleting $\infty \varepsilon S^2$. The coordinates have the matrices id, σ2 as units with real scalar multiplied in form of the matrix with rows (a,b) and (-b,a).If the angle φ for the y-coordinate 2 is substituted, the polar coordinates of the plane is obtained by setting the function φ→exp(iφ), exp the exponential function. This function guides wave descriptions for EMI and matter, also for oscilations of vibrating strings. The measures and maps for complex numbers and the two coordinate descriptions, Gaussian z = x + iy and polar z = r·exp(iφ) are obtained, The multiplication of z with a complex number is geometrically a stretching combined with a rotation (see [13]). Norming 1 means that a rasius measure is missing. The symmetry U(1) for EMI is a rolled up e7 octonian Kaluza-Klein coordinate where radius r = 1 is set. Space is projective normed to flat [y,z]-coordinates. Since the third T time reversal operator of physics is not used until now, it can do this and the Pauli σ3 matrix makes the time reversal. The C,P.T oprators are then as symmetry together with id the Klein 4-group where the matrices are of the form already described above for C and T is its negative while P is -id. They form a commutative subgroup of the quanternions with one rotation and two reflections as symmetry of the dihedral D2.T makes the leptonic coupling of spin with either the magnetic momentum or the momentum for electrical charged or neutral leptons. As an extension of this symmetry the Gaussian z coordinates are doubled to quaternions. The spacetime coordinates have then a complex matrix description in (z1 = z+ict,z2=x+iy) (here z is the third space coordinate not the complex z). The second row of this matrix is (z3=x-iy,z4=z-ict).. The diagonal of this matrix uses the σ3 Pauli matrix and id, the other matrix diagonal the σ1,σ2 matrices. For the projective extension of real to complex numbers one can start by presenting real numbers in projective form [x,w=y] and extend it to [x,y,w] by using the real cross procuct which sets w orthogonal to the xy-plane. The cross product exists in every dimension. For this case it measures as length unit the area of the rectangle as x·y. In one dimension higher it measures for [x,y,z,w] a volume as x·y·z for heat with the equation pressure times volume is scaled temperature. The pressure on the volumes surface arises through the motion of systems contained in the volume.

In a further extension [x,y,z,t,w] the Euclidean measures are replaced by the Minkowksi measure already introduced earlier, $r^2 = x^2+y^2+z^2$ is set. For 5 dimensions the field of [12] is recommended which also can be for other field presentations, not only for Schmutzer. The extension to 6 dimensions form also a complex space (z1,z2,z3=(e5,e6))εC^3 with the complex, not the real cross product. It is for the G-compass (figure 6), color charges as QCD energy of quarks and the strong interaction. The color charges are set conjugate x, x‘ in z1= x+ix‘, z2= y+iy‘z3= z+iz‘ and generate the Heisenberg uncertainties, coupling on an x-axis position x with e5 as momentum p as λp = h, on a y-axis the polar angle φ with angular momentum L on e3 as φL = h and on the z-axis a time intrval and inverse frequency f = 1/Δt in energy E = hf.. The hedgehog figure is generated for there location.

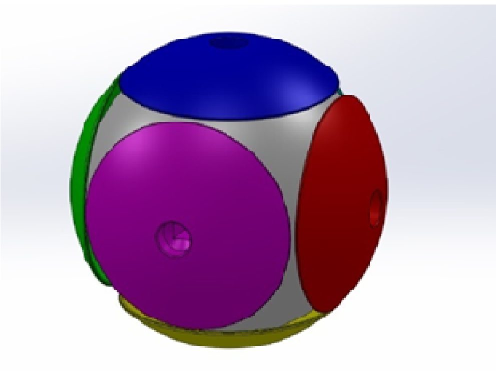

Figure 8 hedgehog polar caps are on the x-axis for e1 on +x and e5 on the -x-axis (color charges r, r‘), for e2 on +y and e3 on -y (color charges g, g‘) and for e4 on +z and e6 on -z (color charges y=b‘, b)

The last projective extension [z1,z2,z3,exp(iωt)] introduces a radial unscaled oscillation function for excitations of quasiparticles. The octonian e0 coordinate was normed earlier, no extension is then needed for a P□. There are now three buildings where physical systems can live, the octonians the projective spaces P^n up to n=8 and the complex possible cross product extension (z1,z2,z3,z4=(e0,e7))εC□. This is also a doubling of quaternions q coordinates to octonian (q1,q2) coordinates. Strong interaction needs a symmetry building SU(3) with 8 Gell-Mann matrix generators λj. They have another multiplication table than octonians. For j=1,2,3, it is a 3-dimensional unit sphere S^3 as location. The blown up 3x3-matrices from the Pauli matrices project S^3 down to the Hopf S^3 for the weak SU(2) interaction in spacetime. The carrier for λ1,2,3 is a *rgb*-graviton which is a whirl like magnetic flow quantums, but has also a wave presentation. Observed it is as the neutral color charge of nucleons and in form of waves. As trivial fiber bundle to as S^3 a unit sphere S□ is added as a product for the strong geometry of SU(3). S□ is projective normed as fiber bundle with fiber S^1 to a complex 2-dimensional inner spacetime for deuteron and atoms CP^2 which has a bounding S^2 sphere for the hedgehog figure. Also the weak S^3 has S^2 as image $h(S^3) = S^2$ under the Hopf map h with fiber S^1. Thie geometry is describing leptons locations in spacetime. Thw CP^2 are solid balls in space satisfying the Pauli principle, no two are on the same location. Waves can have suoerpositions to wave packkages and have then the same location in space. Spheres S^n, n = 0,1,2,.. arise by norming with the polynomial a radius $r^n=1$ in a real space R^n. S^2 is also generated by adding a stereographic point at infintiy. The use of Einstein projection maps is more general for n-dimensional stereographic maps, for orthogonal, often spiralic projections or the Minkowski projection where the compass needle of figure 6 is turned by the special relativistic scaling factor v/c for the rescaling of coordinate units. On one ray of the needles two positions are the units of a coordinate system at rest, as an observer, on the other the one for the second coordinate system units which is in motion like an observed train to the observer. The Minkowski compass uses the matrix M of order 2 with rows (-1,1), (0,1) and the G-compass interchanges colums and uses for G the Schwarzschild radius scaling factor matrix of order 6 with rows (1,-1), (1,0). The special elativistic speed occurs also in deuteron as rescaling weak to strong coordinates in motion against the first ones. Deuteron has associated with them tow driving SI-, WI-motors not described here which add the Schmutzer POT driving motor in another presentation of the G-compass as 6 roll mill. It is construccted in catastrophe theory for a polymer flow driven by six rolls and three motors fro a suitable potential and ahs as geoemtry an eeliptic umbilic. The coupling of roles is as in the hedgehog; 15 driven by POT, 23 driven by the strong force SI and 46 dirven by the weak force WI. ´´´´

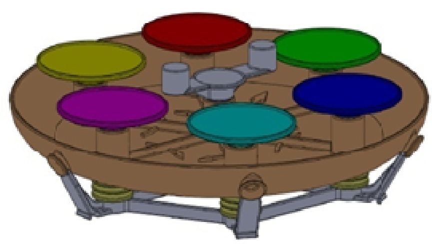

Figure 9. 6 roll mill, red-turquoise rolls are driven by POT and run cw, green-magenta are driven by SI and run mpo, for the WI driven yellow the roll turns mpo and blue cw, instead of the rolls driven by three motors it is possible to drive a potential flow about the rolls as poles. Potentials are then generated and poles (like sink or source) are considered complex for integrations along a simple closed circle for the complex residuation theory

As alternative to linear spaces arise unit spheres and fiber bundles geometries. The use of fiber bundles for S^3 and S□ was described as well as the use of a unit fiber or Kaluza-Klein circle. S^2 introduces with its Moebius transformations a symmetry which is added to the U(1), SU(2), SU(3) symmetries of physics. Its actions are described in another article of the author and not repeated here. S^3x S□ is the toroidal geometry of SU(3) and S^3 the weak Hopf geometry.

Dark energy has its frequencies at highr speed than c located inside a Horn torus wher a cylinder is closed at infinity by a Minkowski cone and has a sigularity. As well the location of dark matter inside a solid ball of radius less than its Schwarzchild radis is geometrically another Horn torus having it singularity as center. In the center a dens amount of lemniscate 1-dimensional retracted quarks ar joined with their center. In a decay also as higgs bosons they are separated and get disjoint centers for their blown lemniscates which have then brezels of genus 2 as surface not the leptonic Hopf torus of genus 1. An exciton quasiparticle allows to form diquarks and dileptons. These have as weak bosons the Hopf S^3. The heegard decompositions for S^3 apply for generating a decay of S^3 into two geometrical 3-dimensional parts which have as surface in S^3 a brezel of genus n. S^3 can decay into two solid balls (genus 0), into an electrical charged and its partner neutral lepton (genus 1) and for genus 2 into two quarks when a meson is getting a stretching energy that high that two quarks can be generated through an intermediate weak boson interaction into two quarks. For n =3 as genus it is possible to use it for the nucleons three quarks inside its location. The dihedrals Dn with there symmetries can be added as a new building. D3 is the SI rotor symmetry. It is obtained by factoring out the Klein CPT group of order 4 from the symmetry of order 24 of a tetrahedron. The octahedron of figure 8 has two such terahedrons inside by adding to a nucleon quark triangle location as forth point its center. This is also descibed in other articles of the author and not repeated here. Brezels of genus 6 can be used for the 6 roll mill. In case an 8 roll mill is needet the dihedral D8 is used. No other dihedrals (n not 0,1,2,3,6, possibly 8) are used until now in the MINT-Wigris theory, except possible for n = 4 and the WI rotor. The case n = 0 is for U(1) and the 0-dimensional sphere with its points +1, -1 for excitons stetting dipoles or for magnetic momentum.

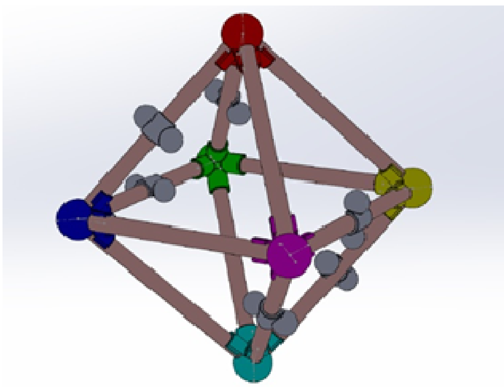

Figure 10. Octahedron for deuteron with 6 quarks location; the nucleons sides carry gluons for the gluon exchange between diquarks, the diquarks are r'b, g'b and deay into single quarks; for the WI rotor the diquarks are ud on the diagonals on the x-, y- or z-axes

A long list of how to use the projective spacces and stereographic rolled up linear spaces to spheres can be produced. This is postponed for article mot written in 2019. Figures above have been presented in a MINT-Wigris Tool bag. It contains the eight 3-dimensional demonstration objects of figure 10: the G-compass, hedgehog, 6 roll mill, octahedron, setting barycentrical nucleon coordiantes, deuteon stereographic projections into a plans a template for drawings on paper and the two Horn tori for dark energy and dark matter.

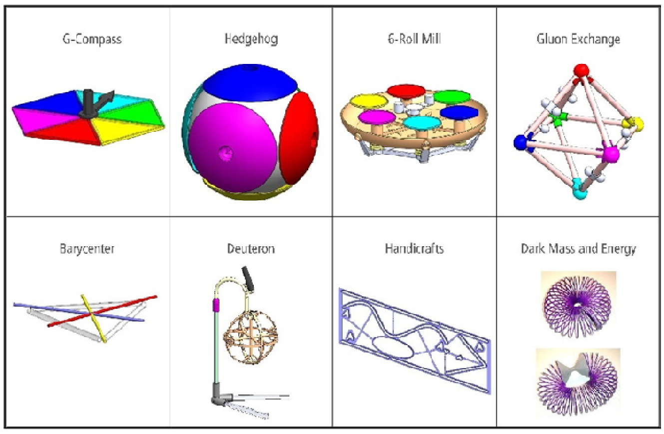

Figure 11. MINT-Wigris Tool Bag

REFERENCES

Beutelspacher et al., A. Projective Geometry, Cambridge Univ. Press, Cambridge UK, 1998

Deuteron States Model, in: Journal of Lasers, Optics & Photonics, vol. 5, issue 1, 2018;

G. Kalmbach H.E. with U. Eberspaecher, MINT-Wigris Tool Bag, Bad Woerishofen, 2019 https://en.wikipedia. org/wiki/Dihedral

Generation and annihilation, J. of Physics & Astronomy, vol. 6, issue 2, 2018; Collisions of mass systems, Intern. J. of Current Innov. Research, vol. 4, issue 6(A), 2018; Octonians for Astrophysics, J. of Astrophysics, vol. 1, issue 3, 2018; Energies basic numbers, Advance Research J. of multi-disciplinary discoveries, vol. 29.1 2018; Einstein metrics and two projection maps, Journal of modern and applied Physics, vol. 2.2, 2018; Octonian System, Acta Sc. Women Health, vol. 1, issue 2, 2019 (10 pages); View physical systems new, Acta Scientifica Publ. 2019, vol. 2, issue 7

Georgi, H. Weak interactions and modern particle theory, Dover Publ. Mineaola, 2009

Internet video under YouTube: Moebius Transformations Revealed 2014

Kalmbach , G. and R. Schweizer, Mathematik – bunt gemischt II, Becker, Velten, 1996

Kalmbach G. H.E., Deuteron States, Nessa Journal of Physics, 2017, vol. 1, issue 2, pp. 1-17 and further articles of the author, partly quatoed under [10] .

Kalmbach, G. H.E., MINT-WIGRIS, MINT Verlag, Bad Woerishofen, 2017, available under: https://www.scholars-press.com

Kalmbach, G. Quantum Measures and Spaces, Kluwer, Dordrecht, 1998

Many related MINT articles and parts of books in the 104 items long list of the authors (mostly scientific) publications. Often they are stored in the internet and can be downloaded or are available in the authors MINT (Mathematik, Informatik, Naturwissenschaften, Technik) book editions, vol. 1-39, 1997-2019, - the Deutsche Nationalbibliothek Frankfurt/M.

Projective gravity, in: ijcrr Internat. Journal of Contemporary research and review vol.9, issue 3, 2018; also in: Journal of Lasers, Optics & Photonics 2017proceedings;

Schmutzer, E. Projektive einheitliche Feldtheorie, Harry Deutsch, Frankfurt, 2004

Seymour, M. H. Quantum ChromoDynamics, in arXiv hep-ph/0505192v2, 9 Oct 2010 and CERN-2010-001 proceedings 2009, pp. 97-143