This theory is 0

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Key words, Mandelbrot set, Dirac equation, Metric

Abstract All mathematicians know that the limit of a Cauchy sequence of rational numbers is a Cauchy real number (Cantor(7) 1872). So all we did here is show we postulated real#0 by using it to derive a rational Cauchy sequence with limit 0. We did this because that same postulate (of real#0) math *also* implies fundamental theoretical physics (eg.,the Newpde 'solutions' below) making this a Ultimate Occam's Razor postulate(0) implying the ultimate math-physics theory, a important result indeed. Nothing is more 'Occam' than postulate0.

Theory But we need to define the algebra first and use it to write the postulate. So define 1)*numbers* 1≡1+0 and **0≡**0X0,1≡1X1 as *symbol* **z=zz**: the *simplest* algebraic definition of **0**. So **2)Postulate** *real* number **0** *if* **z'=0** and **z'=1** plugged into z'=z'z'+C (**eq.1**) results in *some* C=0 constant(ie δC=0).

This is our *entire* Ultimate Occam's Razor **postulate(0)** ***theory***

Application: (i.e.,*plug* **z= 1,0** into eq.1 as required by above theory.)

•Plug in **z=0**=z_o=z'in **eq1.** The equality sign in eq,1 demands we substitute z' on left (**eq1)** into right z'z' repeatedly and get iteration $z_{N+1}=z_Nz_N-C$. Note the *numbers* z_N possibly are larger than 1 so the larger 1+1≡2, 1+2≡3, etc (*defined* to be a+b=c) and define rules of algebra on these *numbers* like a+b=b+a (eg.,ring-field) with no new axioms. So postulate 0 also *generates* the big *numbers* and thereby the algebra we can now use:

Constraint **δC=0** also requires we reject the Cs for which $-\delta C=\delta(z_{N+1}-z_Nz_N)=\delta(\infty-\infty)\neq 0$. The Cs that are left over define the fractal **Mandelbrot set** $C_M=C=\delta z'=10^{40N}\delta z$, N=integer with that required subset C=0. These fractal scales having their own δz that perturb that **z=1** so put z=1+δz in **eq.1** to get δz+δzδz=C (3)

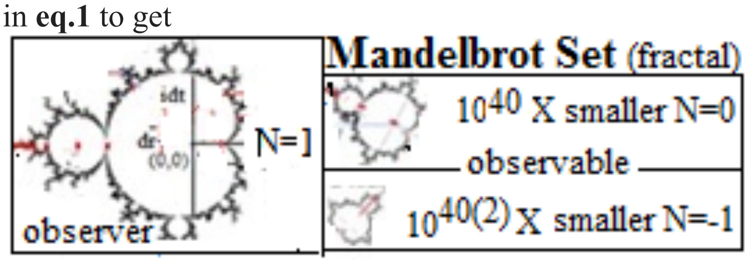

fig1 'observers' fractal scale N then define M< N as the 'observables' scale M. For example we can define the fig1 'observer' fractal scales as N≥1 implying |δz|>>1. Also we must solve equation 3 as a quadratic equation

$$\delta z=(-1\pm\sqrt{1+4C})/2 \equiv dr+idt \text{ if } C\leq -1/4 \text{ (complex)} \quad (4)$$

Note the Mandelbrot set iteration (ie., $z_{N+1}=z_Nz_N-C$) for this δC=0 *extremum* C=-¼ is a rational number Cauchy sequence -¼, -3/16, -55/256, ..,**0** thereby proving our above postulated *real#0* math. QED

•Plug in **z=1** in z'=1+δz in **eq1**, So **δC=0**= (eq1 implies eq3)=δ(δz+δzδz)=δδz(1)+ δδz(δz)+(δz)δδz= (observer |δz|>>1) ≈δ(δzδz)=0=(plug in eq.4) =δ[(dr+idt)(dr+idt)] =

$$\delta[(dr^2-dt^2)+i(drdt+dtdr)]=0 \quad (5)$$

=2D δ[(Minkowski metric, c=1)+i(Clifford algebra→eq.7a)] (≡Dirac eq)

Factor real eq.5 $\delta(dr^2-dt^2)=\delta[(dr+dt)(dr-dt)]=0=[[\delta(dr+dt)](dr-dt)]+[(dr+dt)[\delta(dr-dt)]]=0$ (6)

so -dr+dt=ds,-dr-dt=ds≡ds_1(→±e) Squaring&eq.5 gives circle.in e,v (dr,dt) 2^{nd},3^{rd}quadrants (7)
& dr+dt=ds, dr-dt=ds, dr±dt=0, light cone (→ν,$\bar{\nu}$) in same (dr,dt) plane 1^{st},4^{th}quadrants (8)
& dr+dt=0,dr-dt=0 so dr=dt=0 defines vacuum (while eq.4 derives space-time) (9)
Those quadrants give *positive* scalar drdt in eq.7 (if *not* vacuum) so imply the eq.5 *non* infinite extremum imaginary≡drdt+dtdr=0≡$\gamma^i dr\gamma^j dt+\gamma^j dt\gamma^i dr=(\gamma^i\gamma^j+\gamma^j\gamma^i)drdt$ so $(\gamma^i\gamma^j+\gamma^j\gamma^i)=0$, i≠j (from real eq5 $\gamma^j\gamma^i=1$) (7a) Thus from eqs5,7a: $ds^2= dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ Note how eq5 Dirac eq. and C_M Mandelbrot set just fall (pop) out of eq.1, amazing!

We square eqs.7 or 8 or 9 $ds_1^2=(dr+dt)(dr+dt)=(-dr-dt)(-dr-dt =[dr^2+dt^2] +(drdt+dtdr)$ $\equiv ds^2+ds_3=ds_1^2$. **Circle**≡$\delta z=dse^{i\theta}= dse^{i(\Delta\theta+\theta_o)}= dse^{i((\cos\theta dr+\sin\theta dt)/(ds)+\theta_o)}$, θ_o=45° min of $\delta ds^2=0$ given eq.7 constraint for N=0 δz' perturbation of eq5 flat space. We define k≡dr/ds, ω≡dt/ds, sinθ≡r, cosθ≡t. $dse^{i45°}$≡ds'. Take ordinary derivative dr (since flat space)
of 'Circle' $\frac{\partial\left(dse^{i\left(\frac{rdr}{ds}+\frac{tdt}{ds}\right)}\right)}{\partial r}=i\frac{dr}{ds}\delta z$ so $\frac{\partial\left(dse^{i(rk+wt)}\right)}{\partial r}=ik\delta z,$ thus $k\delta z=-i\frac{\partial\delta z}{\partial r}$ (11). N=0 small δz' =C_M/ξ is a rotation on that circle at 45° so modified eq.7:

(dr-δz')+(dt+δz')≡dr'+dt'=ds (16)

Define $\kappa_{rr}\equiv(dr/dr')^2= (dr/(dr-\delta z'))^2= 1/(1-r_H/r)^2 =A_1/(1-r_H/r) +A_2/(1-r_H/r)^2$. The partial fractions A_I can be split off from RN and so $\kappa_{rr}\approx 1/[1-r_H/r]$. From eq.7a $dr'dt'=\sqrt{\kappa_{rr}}dr'\sqrt{\kappa_{oo}}dt'=drdt$ so $\kappa_{rr}=1/\kappa_{oo}$ (17)

•**Both <u>z=0,z=1</u>** together (<u>in eq1.</u> Use 3D orthogonality to get (2D+2Dcurved space)). Thus δz'+δz=
$(dx_1+idx_2)+(dx_3+idx_4)\equiv dr+idt$ given $dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ *if* $dr^2\equiv dx^2+dy^2+dz^2$ (3D orthogonality) so that $\gamma^r dr\equiv\gamma^x dx+\gamma^y dy+\gamma^z dz$, $\gamma^j\gamma^i+\gamma^j\gamma^i=0$, i≠j,$(\gamma^i)^2=1$. From eq,17
$(\gamma^x\sqrt{\kappa_{xx}}dx+\gamma^y\sqrt{\kappa_{yy}}dy+\gamma^z\sqrt{\kappa_{zz}}dz+\gamma^t\sqrt{\kappa_{tt}}idt)^2= \kappa_{xx}dx^2+\kappa_{yy}dy^2+\kappa_{zz}dz^2-\kappa_{tt}dt^2= ds^2$. Multiply both sides by $\hbar^2/ds^2$ and $\delta z^2\equiv\psi^2$ use eq11 inside brackets( ) get 4D QM $\gamma^\mu(\sqrt{\kappa_{\mu\mu}})\partial\psi/\partial x_\mu=(\omega/c)\psi$ ≡Newpde for e,*v*, $\kappa_{oo}=1-r_H/r =1/\kappa_{rr}$, $r_H=C_M/\xi=e^2X10^{40N}/m$ (**N**=. -1,0,1.,).

Postulate(0)→Newpde

Solution to Newpde e,*v*: stable **$2P_{3/2}$** at $r=r_H$

N=0 Mandelbulbs: **Free space:** τ, μ, e **leptons.** On**Sphere** **$2P_{3/2}$** at $r=r_H$ 3e **baryons** (QCD not required)

N=1 inside zitterbewegung oscillation $r<r_C$ N=1 puts us in the **cosmological expansion** stage
Other results (besides Newpde) from postulate0, eg., Copenhagen stuff and 10^{82} electrons **e** between consequitive fractal scales such as N=1 cosmological $r=r_H$, $2P_{3/2}$

perturbation objects B,C

Object B N=0 perturbations of κ_{oo} and κ_{rr} in the Newpde **E&M,** N=-1 gravity GR
Object C N=0 " " **weak,** both **SM**

That eq1 **iteration generates** (rel0)& possibly larger numbers 1+1≡2, 2+1≡3.etc as *defined* symbols a+b=c and **algebra rules** (eg.,ring-field def. like a+b=b+a). *with no new axioms*.
Thus (with the math&physics) we understand *everything* (eg GR, cosmology, QM,e,*v* SM, baryons, rel#).

So the *simplest idea imaginable* 0 implies all *fundamental math-physics.* no more, no less(eg simply 4D)

•**Conclusion:** So by merely (<u>plugging</u> 0,1<u> into</u> <u>eq.1)</u> **postulating 0**, out pops the whole universe, BOOM! easily the most important discovery ever made or that will ever be made again. We finally figured it out.

Reminder:
Note also that 0 is not the same as the null set ∅ since 0 is a real number and ∅ isn't.
So when we postulate 0 we are also implicitly postulating the real# nature of 0.

Summary This **Theory is** 0 The rest is a real **number** 0 **definition**

We need to define the algebra first and use it to write postulate0. So define **numbers** 1≡1+0, and 0≡0X0, 1≡1X1 as symbol z=zz the simplest algebraic definition of **0**. **So**

Theory Postulate 0	Real# 0 **definition** if z=1 and z=0 (plugged) into z=zz+C eq.1 gives some C=0 constant(ie δC=0)

Can't be more Occam than postulate(0). All the rest is those 2 'plug in' **applications**. So must

1) **plug z=0** into **eq.1** (given the implied z=zz+C eq1 iteration) to get the 2D (fractal) Mandelbrot set to prove postulate real 0. Iteration numbers might be bigger 1+1≡2, 1+2≡3 etc., with *defined* symbols a+b≡c and algebra rules eg., a+b≡b+a. So the *postulate generates real# math* without extra axioms
2) **plug z=1** into **eq.1** and get 2D Dirac equation.
Both Mandelbrot and Dirac results together give 2+2=4D Newpde (plus some Copenhagen stuff)

Solve the differential equation (Newpde) to get the physical universe, no more, no less.
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Conclusion: Ultimate Occam's razor postulate(0) implies ultimate math-physics.

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Scction 1

Postulate *real* number **0** *if* **z'=0** and **z'=1** plugged into z'=z'z'+C (**eq.1**) results in *some* C=0 constant(ie δC=0)

These are 2 plugin **Applications:** Plug 0 into eq.1 iteration get 2D Mandelbrot set (fractal scaleN
Plug 1 into eq.1 get 2D Dirac eq. N=1

Dirac with Mandelbrot together **gets** e,v 4D **Newpde:**

$\gamma^\mu(\sqrt{\kappa_{\mu\mu}})\partial\psi/\partial x_\mu=(\omega/c)\psi$ ≡Newpde for e,*v*, $\kappa_{oo}=1-r_H/r=1/\kappa_{rr}$, $r_H=C_M/\xi=e^2X10^{40N}/m$ (**N**=. -1,0,1.,).

Solve Newpde e,*v*; stable state **$2P_{3/2}$** at $r=r_H$

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Appendix A Other QM results (besides Newpde) from postulate0, eg., **Copenhagen** stuff. and 10^{82} electrons **e** between fractal scales such as cosmological N=1 e objects B.C inside $r=r_H$, $2P_{3/2}$ **Newpde perturbation** of κ_{00}, κ_{rr} with these **e** objects B,C

Appendix B N=0 perturbations of the Newpde κ_{oo} and κ_{rr} by object B **E&M,** N=-1 gravity GR

Appendix C N=0 " " " object C **weak,** both **SM**

Appendix D Mathematical symbols: That eq1 **iteration generates** (rel0)& possibly larger numbers 1+1≡2, 2+1≡3.etc as *defined* symbols a+b=c and **algebra rules** (eg.,ring-field def. like a+b≡b+a). *with no new axioms*.

So Ultimate Ocam's razor postulate(0) implies ultimate math-physics!!!!!!!!!!!!!!!!!!!!!!!!!!!

sect.1 This **Theory** is **0**

All mathematicians know that the limit of a Cauchy sequence of rational numbers is a Cauchy real number (Cantor(7) 1872). So all we did here is show we postulated real#0 by using it to derive a rational Cauchy sequence with limit 0. We did this because that same postulate (of real#0) math *also* implies fundamental theoretical physics (eg.,the Newpde 'solutions'below) making this a Ultimate Occam's Razor postulate(0) implying the ultimate physics theory, a important result indeed. Nothing is more Occam than postulate0.

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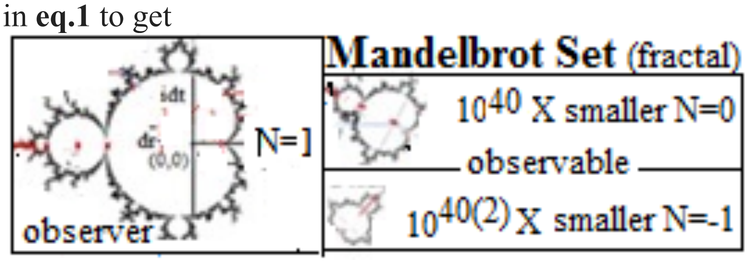

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The (Postulate 0) 2nd plugin implies we

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Recall from the Mandelbrot set iteration rational Cauchy seq. starting at –¼ rational# sequence has limit of 0 so 0 is a real number. Note for required small C→0 (for the z=zz postulate 0 to hold) ≈ δz≈dr along the dr axis, with the limit of the real number limit 0 where our Cs are real numbers and so our eigenvalues dr/ds are real observables. So given δz≡ψ, p_r≡ħk, Note k=dr/ds here is a real number. Then from eq.11 we can write $\langle p_r\rangle^*= \int(p_r\psi)^*\psi d\tau =\int\psi^* p_r\psi d\tau =\langle p_r\rangle$. Therefore p_r=ħk is Hermitian. Thus the Mandelbrot set iteration here did double duty also as proof of the real number eigenvalues(observables) in eq.11. Cancel that $e^{i45°}$coefficient (45°=π/4) then multiply both sides of eq.11 by ħ and define δz≡ψ, p≡ħk. Eq.11: the familiar
'observables' p_r in $p_r\psi = i\hbar\frac{\partial\psi}{\partial r}$ (11)
Repeat eq.3 for the τ, μ respective δz Mandelbrot set lobes in fig.6 so they each have their own neutrino *v*: Lepton generations.
That means the **mathematics *and* the physics** come from (**postulate** 0): *everything*. Recall from eq.7 that dr+dt=ds. So combining in quadrature eqs 7&11 SNR X δz= (dr/ds+dt/ds)δz =((dr+dt)/ds)δz=(1)δz (11a) and so having come *full circle* back to sect.1 postulate 0 as a real#

That figure 1 Mandelbrot set structure can be pulled out of the zoom clutter because of the above 4X *circle* observability sequence in fig1
We can pull out the above 4X *circle* observability sequence in fig1 from the zoom clutter
Recall C is a function on the complex (dr,idt) plane so $\delta C = \left(\frac{\partial C}{\partial r}\right)_t dr + \left(\frac{\partial C}{\partial t}\right)_r idt = 0$ (12)
implying there are several δC=0 (dr,idt) extreme possible here. The first 1D extremum is provided by eq.4 and is that dr axis extremum C_M=- ¼ which incidently is the only rational number extremum on our C_M, Another extemum clearly is that ∂C/∂t=0, dr=constant, The last 1D extemum is ∂C/∂r, dt constant N=2 (observable internal QMS jumps in fig1 in partIII) with the rest unobservable.
The only 2D dr,idt extremum we divide eq.12 by dt so that above fig.1 4X sequence of those o*bservable* circles drdt= $darea_M$≠0 (so eq.11 observables) the real δC=0 extremum given the decreasing observable *real* circle radius sequence $\lim_{m\to\infty}\frac{\partial C}{\partial(drdt)_m}dr_m = \lim_{m\to\infty}\frac{\partial C}{\partial area_m}dr_m =$ $\lim_{m\to\infty}\frac{\partial C}{\partial Circle_m}dr_m = \text{KX0} = 0$ (since dr_∞≈0)=Fiegenbaum point=f^α=(-1.40115.,i0) =C_M≡end(12a
our final *realization of δC=0.* So random circles in the zoom don't do δC=0. Note if a circle (or many circles) is rotated (U), translated (D), shrunk (S) equally in both dimensions (i.e.,

$(\partial x^j/\partial x'^k) f^j = f^k \equiv \begin{bmatrix} f_{1N} \\ f_{2N} \end{bmatrix} = S_N \begin{bmatrix} U_{11} & U_{12} \\ U_{21} & U_{22} \end{bmatrix} \begin{bmatrix} f \\ 0 \end{bmatrix} + \begin{bmatrix} D_{1N} \\ D_{2N} \end{bmatrix}$) it is still a circle, eq.11 still holds, so *it's still an observable* as seen in the N fractal scale zoom. Thus you can pick out from that zoom these fig.1 Mandelbrot set extremum 4Xdiameter circles as the only o**bservables** *and* δC=0 extremum geometry in all that clutter. Reset the zoom, restart at such $S_N C_M = 10^{40N} C_M$ in eq.17.

$C=C_M$ Source **Small C definition and two Mandelbulb masses**

Our postulate 0: (z=zz+C)≈(z=zz+0)) requires a small C

But for **N=0** eq.3 δz+δzδz=C reads C≈δz. So that postulated small C≈0 implies an eq.5 Lorentz (Fitzgerald) contraction (9) 1/γ boosted frame of reference (fig.6) **small C**$\approx\delta z/\gamma=C_M/\xi=\delta z'$ (10)

Therefore δC=0 and eq.10 implies we take variation of $C=C_M=\xi\delta z$

So this same ξ is merely large in eq.10 with this N=0 δz' the curved space perturbation δz' in eqs.11,12. Also in *sect.1 z'*=1+δz *z* is called the perturbation z'. So on N=0 ***δC=0*** =δ(δz)=δ(*z'*-1) =δ*z*=0 so even perturbation *z* is the extreme of δz'|=-1 or δ*z*=0 corresponding to fundamental z=0,1.

So take variation $\delta C=\delta C_M=(\delta\xi)\delta z+\xi\delta\delta z=0$. Also recall above plugin *z*=1+δz. So if δz is small so δξ and ξ can be large (**unstable large mass τ+μ,** sect.D4). (14)

And extremum perturbation z =1 is the reduced mass $\tau+\mu=2m_p$.

For large |δz| in the above variation then

δξ and ξ can be small (**stable small mass: electron** ground state δz (15)

with perturbation *δz*=-1.

From here on look only at what we are ***allowed to observe****:* eq.11 circles: so $\mathbf{\delta(ds^2)=0}$, proper frame. **Nothing else matters but** these ***observables***. (Which are also N<1 for N=1 observer except for observer N=2 seeing what we see: 'observables' can thereby be N=1 cosmology objects (eq.B3a))

For N=1 At high energy Lorentz boost 1/γ of λ=δz=dr then gets small relative to 1 and so δδz gets bigger since we start approaching N=0 instead (of N=1) and so eq.5 fails except for *observables* if for them we still keep (circle) $dr^2-dt^2=ds^2$= radius^2 constant by expressing 'large δδz' as a rotation at 45° in a slightly modified eq.7: (dr-δz')+(dt+δz')≡dr'+dt'=ds (16)

For N=0 θ_o=45° min of $\delta ds^2=0$ given eq.7 constraint δz' perturbation of eq5 flat space and so δz' in eq.16 is large relative to dr,dt. So given the max extremum for ds^2 is on the axis' each extreme can now be Δθ=±45°. So in eq.16 the 4 rotations 45°+45°=90° define 4 Bosons (see Ch.6). But

For N=-1 45°-45° N<0 then contributes (appendix A2) so you also have other (smaller and infinitesimal N=-1) fractal scale extreme δz'(eg.,tiny Fiegenbaum pts so N=1 dr=r, for N_{ob}=-1) so metric coefficient $\kappa_{rr}\equiv(dr/dr')^2= (dr/(dr-(C_M/\xi_1)))^2= 1/(1-r_H/r)^2 = A_1/(1-r_H/r) + A_2/(1-r_H/r)^2$.

The partial fractions A_I can be split off from RN and so $\kappa_{rr}\approx 1/[1-((C_M/\xi_1)r))]$ (17)

(C_M defined to be e^2 charge, $\gamma\equiv\xi_1$ mass). So: $ds^2=\kappa_{rr}dr'^2+\kappa_{oo}dt'^2$ (18)

From eq.7a $dr'dt'=\sqrt{\kappa_{rr}}dr'\sqrt{\kappa_{oo}}dt'=drdt$ so $\kappa_{rr}=1/\kappa_{oo}$ (19)

We can then do a rotational dyadic coordinate transformation of $\kappa_{\mu\nu}$ to get the Kerr metric which is all we need for our applications(9). Recall also from eqs5,7a that $dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$

1.5 Both z=0,z=1 together using orthogonality get (2D+2Dcurved space) . So (z=1)+(z=0)= $(dx_1+idx_2)+(dx_3+idx_4) \equiv dr+idt$ given $dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ *if* $dr^2 \equiv dx^2+dy^2+dz^2$ (3D orthogonality) so that $\gamma^r dr \equiv \gamma^x dx+\gamma^y dy+\gamma^z dz$, $\gamma^i\gamma^i+\gamma^i\gamma^i=0$, $i\neq j$, $(\gamma^i)^2=1$, rewritten (with invariant (8) $\kappa_{\mu\nu}$ eq.17-19) $(\gamma^x \sqrt{\kappa_{xx}}dx+\gamma^y \sqrt{\kappa_{yy}}dy+\gamma^z \sqrt{\kappa_{zz}}dz+\gamma^t \sqrt{\kappa_{tt}}idt)^2=\kappa_{xx}dx^2+\kappa_{yy}dy^2+\kappa_{zz}dz^2-\kappa_{tt}dt^2= ds^2$. Multiply both sides by $1/ds^2$ and $\delta z^2 \equiv \psi^2$ use use operator equation 11 inside brackets( ) get curved space 4D

$$\gamma^\mu(\sqrt{\kappa_{\mu\mu}})\partial\psi/\partial x_\mu=(\omega/c)\psi \quad (20)$$

≡Newpde for e,*ν*, $\kappa_{oo}=1-r_H/r=1/\kappa_{rr}$, $r_H=e^2X10^{40N}/m$ (**N**=. -1,0,1.,). Also $C_M/\xi=r_H=$ *smallC so big $\xi=\gamma$ boost so z=zz so **postulate 0**. So we really did just postulate 0. So

Postulate 0→Newpde

Solutions to New pde (given $e^2 10^{40N}$ X fractal scales N)

N=-1 is GR. $e^2X10^{40(-1)}=e^2/10^{40}\equiv Gm_e^2$, solve for G. So given eq,17-19 $\kappa_{\mu\nu}\equiv g_{\mu\nu}$ Schwarzchild metric

N=0 At **r>>r$_H$** becomes usual Dirac equation e solutions with *non*relativistic limit the Schrodinger equation and appendix C Standard electroweak Model (SM) perturbations.

N=0 e perturbations.At **r≈r$_H$** **1S$_{1/2}$**μ **2S$_{1/2}$** τ, **2P$_{3/2}$** **2P$_{1/2}$** 3e is baryon core(QCD not required). (Part2)

1.6 Newpde 2P$_{3/2}$ at r=r$_H$ state Contrast with QCD

The electron (solution to that new pde) spends 1/3 of its time in each $2P_{3/2}$ (at $r=r_H$) lobe, *explaining the lobe multiples of 1/3e fractional charge* (The 'lobes' can be named 'quarks' or George if you want). The lobes are locked into the center of mass, can't leave, *giving asymptotic freedom* (otherwise yet another ad hoc postulate of qcd). The two positrons are ultrarelativistic (γ=917, sect.7.5, $3e=(\gamma m_e+\gamma m_e)=m_{p\delta\delta}$) so the field line separation is narrowed into plates explaining the strong force (otherwise postulated by qcd). Also there are 6 2P states *explaining the 6 quark flavors.* P wave scattering *gives the jets.* We have *stability* ($dt'^2=(1-r_H/r)dt^2$) since the dt' clocks stop at $r=r_H$. That 2 γ ray scattering off the 3rd mass (in $2P_{3/2}$) diagonal metric(eq.17) time reversal invariance also reverses the γ ray pair annihilation with the subsequent $e^\pm$ pair creation inside the r_H volume given $\sigma=\pi r_H^2\approx$ (1/20)barn making it merely a virtual creation-annihilation event. So our $2P_{3/2}$ composite 3e (proton) at $r=r_H$ is the *only* stable multi e composite So quarks don't exist, it's all just 2 Newpde positrons and electron in $2P_{3/2}$ at $r=r_H$ states.

1.7 Value of C_M source term in New pde

Origin of Mass is 3 extreme Mandelbulbs

Recall postulate of 1 requires that at the end of all these derivations that C≈0. Thus we require a Fitzgerald contracted C provided by a eq.5 frame of reference γ of moving the eq.7 object. .From equation 3 for N=0 C≈δz So $C=\delta z/\gamma=C_M/\gamma\equiv C_M/\xi$. So that $\xi=m_e\gamma$ ($=\tau+\mu=2m_p$ in Mandelbrot set fig.6 for *smallest* stable (so most *observable)* λ_C) in $C=C_M/\gamma=C_M/\text{mass}\equiv r_H$ which also thereby *requires* us to define both mass α γ and charge $C_M=e^2$

Again N=0 equation 10 $\delta z=C_M/\xi$ satisfies extreme condition equation 3 (that is straight from the postulate) and for a (eq11) circular C N=0 nonflat perturbation makes an ξ observable mass (energy operator H). So that 45° extreme δz small (circle) Mandelbulb μ and the tiny antenna Mandelbulb circle then are both observable Newpde masses, so leptons. But μ is not a constant in time because of N=1 eq.12 angle Newpde zitterbewegung variable time t in $\delta z=e^{i\omega t}$ contribution (eq.20) to the δz chord in the small Mandelbulb of the 45° (fig6 below). In contrast the next higher energy antenna is from eq.4 quadratic equation solution at the Fiegenbaum point (so it gives our 2 *fundamental extreme* excited state Mandelbulb) mass τ that does not change over cosmological time in N=1 allowing us to normalize it to 1). Note these are Mandelbulb radii just as eq.7-9 are in fig6, fig4, fig3 of the section 1 eq.3 application for the τ, μ respective Mandelbulb radii δz lobes in fig.6 so they *each* have their own neutrino *v*.eq.7,8,9 with its electron' and neutrino still the core equations even for the muon and tauon thereby deriving the 3 generations of leptons.

Object B mass Effects (see appendix B also)
Note in appendix B the (fractally) selfsimilar to electron (ignoring zitterbewegung for the moment) Kerr metric here is rotating at near c at the equator but inertially frame drags (eg., ergosphere) to the point we see it internally (almost) only as a Schwarschild metric. Due to the drop in inertial frame dragging caused by object B however the eq.B9 Kerr term $(a/r)^2$ is not zero anymore which in the above figure6 is equal to the $C_M/(\delta z\delta z)$ (with $r^2=|\delta z|^2$, define $a^2=C_M$) =mass= $1+\varepsilon+\Delta\varepsilon$ (fig6) whose Newpde fractal mass-energy- zitterbewegung frequency ω is also in the zitterewegung exponent. We call the charge C_M which in other units and off the light cone is $e^{2.}$. Note also δz (in $C_M/(\delta z\delta z)$ is also determined by the frame of reference so by the magnitude of the Lorentz transformation γ boost of δz creating (small C) ξ input into eq.13 in $r_{H.}=C_M/\xi$.

Note these 2D τ,μ Mandelbulbs can be on a flat 2D (z=1) plane or this spherical 2D shell (z=0)
Note the above 3e composite spherical $2P_{3/2}$ shell at $r=r_H$ is the only other stable 2D space (in addition to these z=1 flat 2D) Newpde ground state to define these Mandelbulbs on. Thus high energy 2D $\tau+\mu$ Mandelbulbs provide 3e stability in μ and 3e in τ so $\mu+\tau=3e+3e=$ $(\gamma m_{e.}+\gamma m_e)_\tau+(\gamma m_{e.}+\gamma m_e)_\mu$ as 2 $2P_{3/2}$ orbitals with S and L inside the horizon r_H so unobserved so all that is seen from the outside is (no longer the inside 2P) net J=S'=½**.**

For N=0 observable For N=0 observable z'=1+δz soz' is perturbation z.
z'=0, 11b, Spherical shell: δz=Compton wavelength λ_C on the high energy $2P_{3/2}$ $r=r_H$ 2D spherical shell then is a domain of these same 2D Mandelbulbs μ, τ giving on the 2D shell: $\mu+\tau=3e+3e=(\gamma m_{e.}+\gamma m_e)_\tau+(\gamma m_{e.}+\gamma m_e)_\mu=3e+3e=m_p+m_p$. two body motion equipartition of energy of the intereacting positrons in each of two **baryons** each with **J=S'= ½.** Eq 11b so for each positron $\delta z'=r_H=C_M/\xi_o=C_M/m_e$ in eq.12. with C_M and ξ real numbers.
z'=1, 11a, Free Space: **$r'_H<<r_H$** (so not that shell) because for z=1 $\xi_1>>\xi_o$ $\delta z=\lambda=h/mc$=Compton wavelength, $2\pi r'_H=\lambda$,. $m=\xi_1$. Again 3e for each of 2D free space domain high energy quasi stable μ,τ,: $\tau+\mu=3e+3e=$ 2 free space **leptons** each with **J=S'=½. 11a** so $\delta z=r'_H=C_M/\xi_1=C_M/(\tau+\mu)$ (21)

For N=1 observer eq.3 implies $C=\delta z\delta z/\xi$ so that $\xi=C/\delta z\delta z=$ **C**/(Mandelbulb radius)^2=mass (from fig.6). or as a fraction of τ, with $2m_p=\tau+\mu+e=\xi_1$ electron $\Delta\varepsilon=.00058$ (22)
Recall eq.3 $\delta z+\delta z\delta z=C$. So for N=1 observer $|\delta z|>>1$ so $\delta z\delta z=C$. Given eq.3 for N=0 $|\delta z|>>|\delta z\delta z|$, ($C\approx\delta z$ sect.1for N=0, eq10).

1.8 Postulate 0 implied finally
But γ (observer) =γ (observable) so for the N=0 observable we got the γ from the N=1 observer case in $r_H=C_M/\gamma=C_M/\xi=C$ for small C and so postulate0. Thus we really did just **postulate** 0.

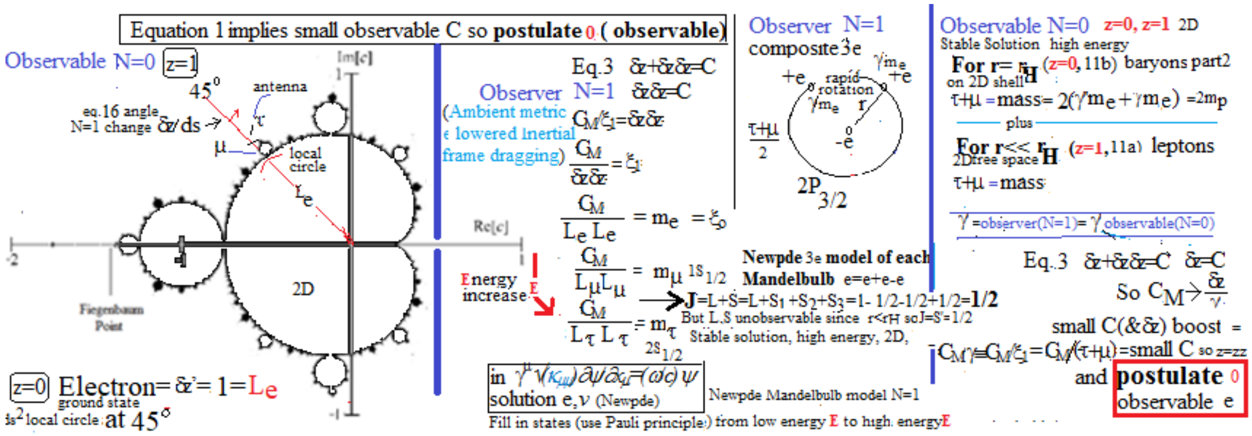


Fig.6 **Conclusion**

So the s**mallC** at the end was required. So we really did just **postulate 0**

So we just do ***what is simplest*** (let Occam be your guide), just **postulate** 0: the physics (Newpde) will then follow, top down:

Ultimate Occam's Razor postulate0

It means here *ultimate* simplicity, the *simplest* idea imaginable. So for example z=zz is *simpler* than z=zzzz. Therefore 0 in this context (uniquely algebraically defined by z=zz) is this ultimate Occam's razor **postulate**. How could you not be more 'Occam' than postulating 0?

Recall that the null set ∅ postulates absolutely nothing

Intuitive Notion (of postulate 0⇔Newpde+Copenhagen stuff**)**

The Mandelbrot set introduces that $r_H = C_M/\xi_1$ horizon in $\kappa_{oo}=1-r_H/r$ in the Newpde, where C_M is fractal by 10^{40}Xscale change(fig.2) So we have found (davidmaker.com) that: Given that fractal selfsimilarity astronomers are observing from the inside of what particle physicists are studying from the outside, that ONE *New pde* e electron r_H, one thing (fig.1). *Everything* we observe big (cosmological) and small (subatomic) is then that (*New pde*) r_H, even baryons are composite 3e. So we understand, *everything*. This is the only Occam's razor first principles theory.

Summary: So instead of doing the usual powers of 10 simulation we do a single power of 10^{40} simulation and we are immediately back to where we started!

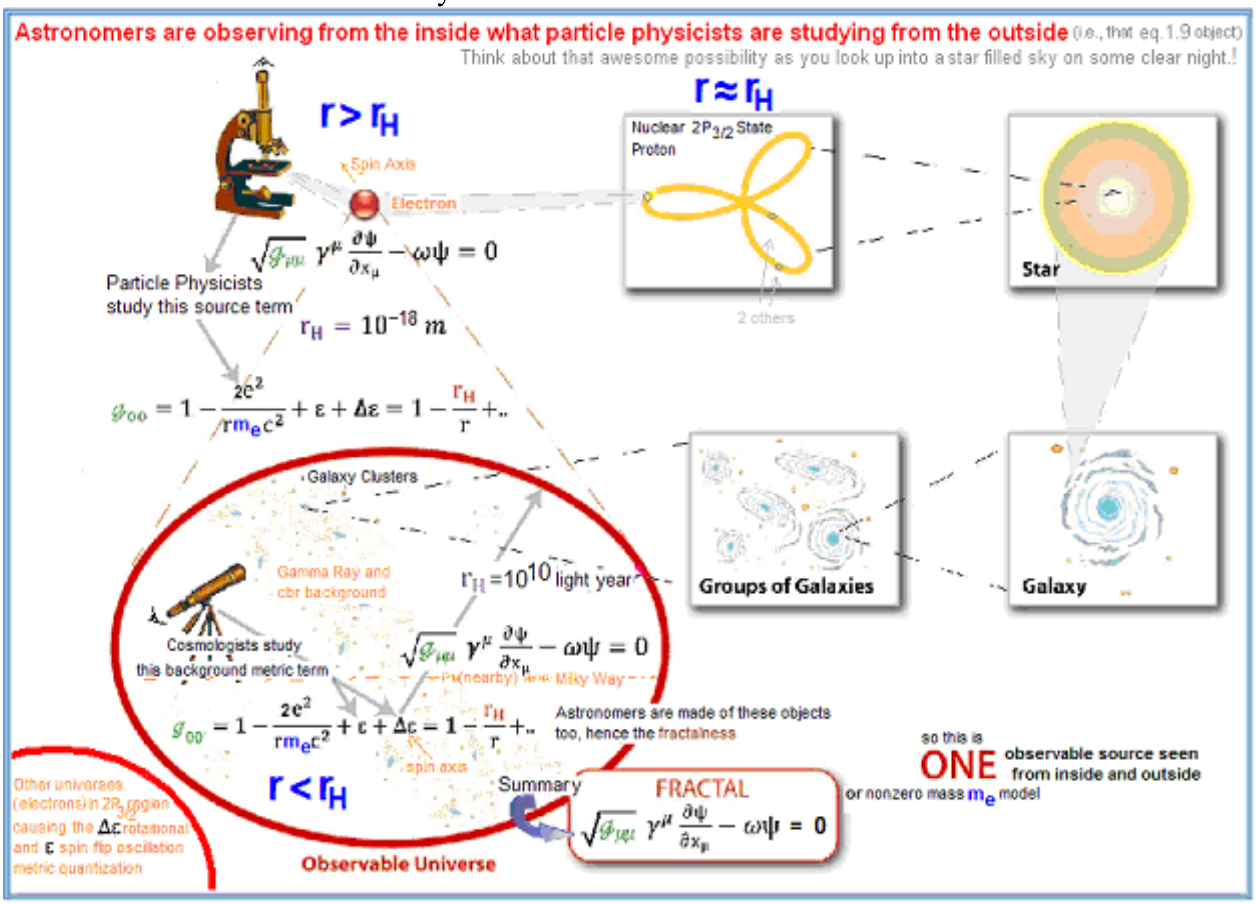


fig2.

(↑lowest left corner) Object C $g_{oo}=\kappa_{00}$ caused caused metric quantization jumps: galaxy→globular->protostar nebula,etc. X100 scale change metric quantization jumps (PartIII)

References

(6) Penrose in a utube video implied that the Mandelbrot set might contain physics. Here we merely showed how to find it. For example the (fractal Mandelbulb neighborhood area |drdt|>0 of the) Fiegenbaum point is a subset (containing that 10^{40}Xselfsimiilar scale jump: Fig1)

(7) Cantor: Ueber die Ausdehnung eines Satzes aus der Theorie der trigonometrischen Reihen, "Ueber eine elementare Frage der Mannigfaltigkeitslehre" Jahresbericht der Deutschen Mathematiker-Vereinigung.". Cantor proved the real# were dense with a binary # (1,0) argument (Our z=zz solutions also implying 11c and appendix F). Thus we capture all the core real# properties with postulate0.

(8)Tensor Analysis, Sokolnikoff, John Wiley
(9)The Principle of Relativity, A Einstein, Dover
(10)Quantum Mechanics, Merzbacher, John Wiley
(11) lemniscate circle sequence (Wolfram, Weisstein, Eric)

Appendix A Extra Copenhagen Interpretation & 10^{82} between fractal scales stuff besides Newpde also directly from postulate 0

A1 Quantum Mechanics core *Is* The Newpde ψ ≡δz (for each N fractal scale) but other stuff comes out of postulate 0 as well (as the Newpde) i.e,the Copenhagen stuff. For example recall from eq.3 for observable fractal scale N=0 we have C≈δz (A1)
with C the Mandelbrot set. The interior of the inner boundary (fig3) of the electron, muon and tauon Mandelbulbs for small angle δz/ds rotations is filled with C points so we can impose a given C^2 continuous envelope function over these points such as δz*δz and it's integral over a volume V_o given by $(\int[(\delta z^*\delta z)/V_o]dV)/V_o = (\int[C^*C/V_o]dV)/V_o$ (from eq.A1) which gives a measure of the number of C s in V_o thereby implying $\delta z^*\delta z/V_o^2$ is a probability density (**in Copenhagen)**. So if the number $\int[C^*C/V_o]dV/V_o$ is equal to 1 then the total probability is 1 that the electron is in V_o. So we did not have to postulate noise C for the purpose of introducing probabilities, we derived it instead given that the Mandelbrot set is plenty noisy with all those C points especially on the edges.. Also recall the solution to (postulate 1) z=zz is 1,o. Recall eq.11b that the electron is δz=-1. In z=1-δz, δz*δz is -1*-1=1 and so from eq. A1 can then be interpreted as probability density, the probability of z being o. Recall z=o is the $\xi_o=m_e$ electron solution(11b) to the new pde so δz*δz=1 is the probability we have just an electron (11b). So z=zz even thereby conveniently provides us with an automatic normalization of δz. Note also that (δz*δz)/dr is also then a one dimensional probability 'density'. So Bohr's probability density "postulate" for ψ*ψ (≡(δz*δz)) is derived here and even contains the normalization to 1 here. So it is not a postulate anymore. (Thus Bohr was very close to the postulate of 0, and so using z=zz here.). Note this result came directly out of the postulate of 0, not the Newpde.

Note also that the electron-positron eq.7 has *two* components(i.e., dr+dt & dr-dt) that *both* solve eq.5 (and therefore eq.3) t*ogether* as analogous to creating a $\delta z \equiv \psi = \frac{1}{\sqrt{2}}(|\uparrow\downarrow\rangle - |\downarrow\uparrow\rangle)$ singlet state relation with spin S of two opposite spin electrons $(\mathbf{S}_1+\mathbf{S}_2)^2 = S^2$. This singlet ψ can be used as a paradigm-model of the iconic idler-signal (Alice and Bob) singlet QM $\delta(p_A-p_B)$ conservation law state, in the Bell's inequality functions of the idler-signal correlations.. We could then label these two parts of eq.7 *observer* and *object* with associated eq.7 wavefunctions ψ_1, ψ_2 and singlet ψ. Thus if we observe ψ_1 (idler) we must infer that there is a ψ_2 (signal from eq.7) *and* so our singlet wavefunction ψ. So we 'collapsed' our wavefunction to our singlet wave function ψ by observing ψ_1 since *we knew the singlet wave function* existed at the beginning (ala Bertlemann's socks). Then apply the same mathematical reasoning to every other such analog of $\delta z \equiv \psi = \frac{1}{\sqrt{2}}(|\uparrow\downarrow\rangle - |\downarrow\uparrow\rangle)$ singlet cases (eg.,H,V polarized photon emission) and we will also have thereby derived the correlation functions in Bell's inequalities This is then a derivation of the wave function collapse part of the **Copenhagen interpretation** of Quantum Mechanics from eq.7 and so from the first principles **postulate** 0.

But this (Copenhagen interpretation) wave function collapse is actually a tivial principle (i.e.,so it could be the wave function ψ is trivially just what you measure) except, as EPR pointed out, in this kind of conservation law singlet case laboratory initialization paradigm ψ. To (actually) know the initial S_1+S_2 in this $\delta z=\psi=\frac{1}{\sqrt{2}}(|\uparrow\downarrow> -|\downarrow\uparrow>)$ QM singlet state is actually a **rare (laboratory setting) case** and so it's spooky superluminal collapse is not a universeal attribute (that being the new fad taking theoretical physics by storm) of all observed particles. So even the core Bertlmann's socks situation is rare and without it Bell'inequalities don't even apply and so in that case there is no such spookiness.For the trivial single particle case we can say that measurement caused decoherence was the cause of that type of wave fuction collapse.

Also recall from appendix C dr^2+dt^2 is a second derivative *operator* wave equation (A1,eq.11) that holds all the way around the circle and gives the wave equation, waves. In eq.16, N=1 error magnitude C≈δz (sect.2.3) is also a δz' angle measure on the dr,idt plane. One extremum ds (z=0) is at 45° so the largest C is on the diagonals (45°) where we have eq.5 extremum holding: particles. So a wide slit has high uncertainty, so large C (rotation angle) so we are at 45° (eg., particles, Newpde photoelectric effect). For a *small slit* we have less uncertainty in position so smaller C, not large enough for 45°, so only the *wave equation* C1 holds (then small slit diffraction). Thus we derived "wave particle duality" here. So complentarity is derived here, not postulated thereby completing the derivation of the Copenhagen interpretation.
We can count electrons and light quanta here also

Also recall wave equation eq.C1 iteration of the New pde with eq.11 operator formalism. So dr/ds=k in the sect.1 circle $\delta z=dse^{i\theta}$ θ exponent kx with k=2π/λ≡ p/ħ. Multiplying both sides by ħ with ħk≡mv as before we then have the DeBroglie equation that relates particle momentum to wavelength in quantum mechanics as we allready mentioned in section 1. For all the rotations in fig.4 (except the eq.11 IVth to Ist quadrants: in eq.B1 each quadrant rotation provides one derivative for each *v*)$\left[\left(\frac{dr+dt}{ds}\right)+\left(\frac{dr+dt}{ds}\right)\right]\delta z = 2\frac{ds}{ds}\delta z = 2(1)\delta z$ Equation 11 (sect.1) then counts units N of each 2 half integer S=½ angular momentums=1 unit oelectrons (spin1 for W and Z) off the light cone. For the rotation in the eq.11 IVth to Ist quadrants (each quadrant rotation provides one derivative for each *v*) at 45° dr=dt (on the light cone in fig.4) so for Hamiltonian H: $2H\delta z=2(dt/ds)\delta z=2(½)\delta z=(1)\hbar\omega\delta z=\hbar ck\delta z$ on the diagonal so that $E=p_t=\hbar\omega$ for the two *v* energy components, universally. Thus we can state the most beautiful result in physics that E=Nhf for the energy of light with N equal N monochromatic photons. Thus this eq.11c merely counts the number of electrons. It is not list of energy levels (states) as in the (well known) quantization of the energy levels N of the E&M field with SHM.

By the way the Casimir force is simply then the relativistic component of the Van der Waals force, has nothing to do with zero point energy vacuum fluctuations. See Robert Jaffe paper from 2005.

A2 Extra fractal zoom stuff besides Newpde directly from postulate0 such as 10^{82} objects (so including objects A,B,C) between fractal scales

The Fiegenbaum point (11a) is the only part of the Mandlebrot set we zoom from. At the Fiegenbaum point (imaginary) time $X10^{-40}=\Delta$ and real −1.40115 (sect.1.2). At the very beginning (top) C was defined to be constant *only* at C≈0 (||C||<<1). So at the end of all these derivations we still have to have a small C. This implies a boosted SR Lorentz transformation universal reference frame to random (since this transformation drops (cancels) noise C in eq.2, fig6), small C_M subset C≈δz' (from eq.3) =real distance =realδz/γ =1.4011/γ=C_M/γ ≡C_M/ξ_1 using large ξ_1. Note at the Fiegenbaum point distance 1.4011/γ shrinks a lot but time $X10^{-40}\gamma$ doesn't get much bigger since it was so small to begin with at the Fiegenbaum point. Eq.1 then means we have

Ockam's razor optimized **postulated** 0. Given the New pde r_H we only see the $r_H=e^2 10^{40N}/m$ with 10^{82} sources from our N=0 observer baseline. We never see the $r<r_H$ http://www.youtube.com/watch?v=0jGaio87u3A which explores the Mandelbrot set interior near the Fiegenbaum point. Reset the zoom start at such extremum $S_N C_M=10^{40N}C_M$ in eq.13. The splits are in 3 directions from the orbs. There appear to be about 2.5 splits going by each second (given my PC baud rate) and the next Mandelbrot set comes up in about 62 seconds. So $3^{2.7X62}=10^N$ so 172log3=N=82. So there are 10^{82} splits. So there are about 10^{82}splits per initial split. But each of these Mandelbrot set Fiegenbaum points is a $C_M/\xi \equiv r_H$ in electron (eq.10 above). So for each larger electron there are **10^{82} constituent electrons**. Also the scale difference between Mandelbrot sets as seen in the zoom is about **10^{40}, the scale change** between the classical electron radius and 10^{11}ly with the C noising giving us our fractal universe.
Recall again we got from eq.3 $\delta z+\delta z\delta z=C$ with quadratic equation result:
$\delta z=\frac{-1\pm\sqrt{1-4C}}{2}$. is real for noise C<¼ creating our noise on the N=0 th fractal scale. So $¼=(3/2)kT/(m_p c^2)$. So T is 20MK. So here we have *derived the average temperature of the universe* (stellar average). That $z'=1+\delta z$ substitution also introduces Lorentz transformation rotational and translation noise that does not effect the number of splits, analogous to how a homeomorphism does not change the number of holes (which is a Topological invariant).
So the excess C noise (due to that small C' boost) causes the Fiegenbaum point neighborhood internal structure to become randomized (as our present universe is) but the number of electrons (10^{82}) remains invariant. See appendix D mixed state case2 for further organizational effects.
$N=r^D$. So the **fractal dimension=** D=logN/logr=log(splits)/log(#r_H in scale jump) $=\log 10^{80}/\log 10^{40}=\log((10^{40})^2)/\log(10^{40})=$ 2 . (See appendix E for Hausdorf dimension & measure) which is the same as the 2D of eq.4 and the Mandelbrot set. The next smaller (subatomic) fractal scale $r_1=r_H=2e^2/m_e c^2$, N=0th, $r_2=r_H=2GM/c^2$ is defined as the N=1 th where $M=10^{82}m_e$ with $r_2=10^{40}r_1$ So the Fiegenbaum pt. gave us a lot of physics:
eg. **#of electrons in the universe, the universe size, temp**. With 10^{82} electrons between any two fractal scales we are also *certainly allowed objects B&C* in the Newpde $2P_{2/3}$ state at $r=r_H$.

Appendix B. Object B time independent perturbation

N=1 observer (eq.17,18,19 gives our **Newpde metric $\kappa_{\mu\nu}$** at $r<r_H$, $r>r_H$)
Found General Relativity (GR) GR from eq.17- eq.19 so Schwarchild metric and so can do a dyadic coordinate transformation on it to get the Kerr metric and all these free space metrics to get all the solutions to $R_{ij}=0$. N=-1 , $e^2 10^{40(-1)}=e^2/10^{40}=Gm_e^2$, solve for G, get GR.So we can now write the Ricci tensor R_{uv} (and fractally self similar perturbation Kerr metric since frame dragging decreased by external object B, sect.B2). Also for fractal scale N=0, $r_H=2e^2/m_e c^2$, and for N=-1 $r'_H=2Gm_e/c^2=10^{-40}r_H$. **D=5 if using N=-1, *and* N=0,N=1 contributions in same $R_{ij}=0$**
Note the N=-1 (GR) is yet another δz perturbation of N=0 $\delta z'$ perturbation of N=1 observer thereby adding, if these scales share the same time coordinate, at least 1 independent parameter dimemsion to our $\delta z+(dx_1+idx_2)+(dx_3+idx_4)$ (4+1) *explaining why Kaluza Klein 5D $R_{ij}=0$ works so well*: GR is really 5D if E&M

B1 Fractal mass and cosmology

From Newpde (eg., eq.1.13 Bjorken and Drell special case) $i\hbar\frac{\partial\psi}{\partial t}=\frac{\hbar c}{i}\left(\alpha_1\frac{\partial\psi}{\partial x^1}+\alpha_2\frac{\partial\psi}{\partial x^2}+\alpha_3\frac{\partial\psi}{\partial x^3}\right)+\beta mc^2\psi=H\psi$. For electron at rest: $i\hbar\frac{\partial\psi}{\partial t}=\beta mc^2\psi$ so: $\delta z=\psi_r=w^r(0)e^{-i\varepsilon_r\frac{mc^2}{\hbar}t}$

$\varepsilon_r=+1$, r=1,2; $\varepsilon_r=-1$, r=3,4.): This implies an oscillation frequency of $\omega=mc^2/\hbar$. which is fractal here ($\omega=\omega_o 10^{-40N}$). So the eq.16 the 45° line has this ω oscillation as a (that eq.7-9 δz variation) rotation at radius ds. On our own fractal cosmological scale N=1 we are in the expansion stage of one such oscillation. Thus the fractalness of the Newpde explains cosmology. The next higher cosmological scale is independent (but still connected by relativistc superposition of speeds implying a inverse separation of variables result: $i\hbar\frac{\partial\psi}{\partial t}=\beta\sum_N(10^{-40N}(\omega t)_{\varepsilon+\Delta\varepsilon})\psi = \beta\sum_N(10^{-40N}m_{\varepsilon+\Delta\varepsilon}c^2/\hbar)\psi$). Note this means that fractal scale N=1 the 45° small Mandelbulb chord ε (Fig6) is now, given this ω, getting larger with time so 1-t α ε. (See Mercuron equation) B3a. But the fig6 Mandelbulb antenna tauon is stationary so its mass can be set to 1. So at this time (relative to the tauon) the muon =ε=.06, electron Δε=.0005899. (B1)

Set average $e^{(-\varepsilon+\Delta\varepsilon/2)2}=\delta|e^{i\tau\, tz}|$ Newpde zitterbewegung oscillation but τ constant(fig6), doesn't vary in cosmological time tc. So cosmologically (eq. B11) outside r_H of object B for N=0 use tz. For N=1 use tc for cosmologically relevant time dependence.

Define average$(e^{i(\tau+\varepsilon+\Delta\varepsilon)tz})\equiv\delta\overline{z_0}$, So $|\delta z|=|e^{-i\varepsilon_r\frac{mc^2}{\hbar}t}|\delta\overline{z_0}|=\delta\overline{z}_o e^{i\omega t}|==e^{i(\tau+\varepsilon+\Delta\varepsilon))tz+i(-\varepsilon+\Delta\varepsilon(1/2))tc}=\delta\hat{z}_0 e^{i(\varepsilon+\Delta\varepsilon(1/2))2}=\delta\hat{z}_0\sqrt{\kappa_{rr}}$ in $dr'^2=\kappa_{rr}dr^2=e^C\kappa_{00}dr^2=e^{i(-\varepsilon+\Delta\varepsilon/2)2}\kappa_{00}dr^2$ (B2)
But seen from inside at N=1 $E=1/\sqrt{\kappa_{oo}}=1/\sqrt{(1-r_H/r)}$ (B20) then $r<r_H$ & E becomes imaginary in $e^{iEt/h}=\delta z=\sqrt{\kappa_{oo}}dt=e^{-i\varepsilon_r\frac{mc^2}{\hbar}t}\rightarrow e^{(-\varepsilon+\Delta\varepsilon/2)2}$ (B2)
The negative sign from equation B2a below. The reduced mass ground state rotater (Δε/2) for ε for this κ_{00} part of derivation). This $e^{i\Delta\varepsilon/(1-2\varepsilon)}=\kappa_{00}$ asymptotic value must be equal to g_{oo} in galaxy halos in the plane of the galaxy (sect.11.4). Ricci tensor is given by oscillating source.

'Observer' scale N > M 'observables' scale.

Recall from sect.1 if our scale N>M for some object then N is the observer scale and M is the 'observable' scale. Note the scale difference can be very small. Since we we are all electrons that means a slightly smaller scale electron is the observable. But this seems to eliminate astronomy as observation of 'observables' since those objects exist at a *larger* scale N=1. But not to the N=2 scale (the 'gid' scale as I call it) since to him(N=2) the N=1 astronomy scale is an 'observable' scale since N=2 > N=1.

Ricci tensor source term

In that regard the Ricci tensor = $R_{ij}=-1/2)\Delta(g_{ij})$ (where Δ is the Laplace-Beltrami second derivative operator) is not zero and the right side is the metric source. Recall limit R_{ij} as $r\rightarrow 0$ is the source, where alternatively gravity creates gravity feedback loop in the Einstein equations which becomes the modulation of the DeSitter ball implied by the zitterbewegung oscillation. Geometrically, the Ricci curvature is the mathematical object that controls the (comoving *observer*) *growth rate of the volume* of metric balls in a manifold in this case given by the New pde source zitterbewegung. Thus the above Laplace Beltrami source eq. B2 -sinωt≡-sinμ≈-sinε here comes out of the Newpde zitterbewegung B2.

Recall from sect.1 if our scale N>M for some object then N is the observer scale and M is the 'observable' scale. Note the scale difference can be very small. Since we we are all electrons that means a slightly smaller scale electron is the observable. But this seems to eliminate astronomy as observation of 'observables' since those objects exist at a *larger* scale N=1. But not to the N=2 scale (the 'gid' scale as I call it) since to him the N=1 astronomy scale is an 'observable' scale as well since N=2 > N=1.

N=2 'observer' sees what we see using R_{22}=-sinhμ**:** which gives our N=1 'observables'. But $R_{22}=e^{-\lambda}[1+\frac{1}{2}r(\mu'-\nu')]-1$ with μ=ν (spherical symmetry) and μ'=-ν'. So as r→0, ImR_{22}= Im(e^{μ}-1)=μ +..= sinμ=μ+..for outside r_H imaginary μ for small r (at the source) so zitterbewegung sinμ becomes a gravitational source (alternatively gravity itself can create gravity in a feedback mechanism). The N=2 observer then multiplies by i iR_{22}, -isinμ and μ to get R_{22}=-sinhμ (B2A)

to see what the N=2 observer sees that we see inside r_H so:

$R_{22}=e^{-\nu}[1+\frac{1}{2}r(\mu'-\nu')]-1=-\sinh\nu=(-(e^{\nu}-e^{-\nu})/2)$, ν'=-μ' so

(e^{μ}-1=-sinhμ for positive μ in sinhμ then the μ=ε in the e^{μ} on the left is negative (B2B). Object B mostly contributes to μ' in -rμw, with object C providing a tiny perturbation of μ', mplying there is no such positive sinhμ constraint for object C. Thus the object C *perturbation* μ_c in $e^{\mu c}$ coefficient can be positive or negative

$e^{-\mu}[-r(\mu')]=-\sinh\mu-e^{-\mu}+1=(-(-(e^{-\mu}+e^{\mu})/2)-e^{-\mu}+1=(-(e^{-\mu}+e^{\mu})/2)+1=-\cosh\mu+1$. So given ν'=-μ'

$e^{-\nu}[-r(\mu')]=1-\cosh\mu$. Thus

$e^{-\mu}r(d\mu/dr)]=1-\cosh\mu$

This can be rewritten as: $e^{\mu}d\mu/(1-\cosh\mu)=dr/r$

We set the phase μ so that when t=0 then r=0 so use r=sinωt in eq.B1. Given the fractal universe a temporarily comoving proper frame at minimum radius lowest γ must imply a μ Mandelbulb chord 45° intersection that implies minimally the Newpde ground state (Which can't go away analogously as for a hydrogen atom orbital electron.) Δε electron for comoving outside observer where then at time=0, in B1,B2 τ-ε≈ωt=Δε ≈1-1=0 so that ωt=Δε when sinωt≈0. So the integration of B3 is from ξ_1= μ=ε=1 to the present day mass of the μ=muon=.06 (X tauon mass) giving us: $\ln(r_{M+1}/r_{bb})+2=[1/(e^{\mu}-1)-\ln[e^{\mu}-1]]2$ (B3C)

implying gr=e/2m gyromagnetic ratio (μ=m) is changing with time as was discovered recently at Fermi lab 2023 (Ch.7) with CERN 1974 gr muon data for comparison.

B2 Introduction to Δε contribution to what N=2 sees

μ in -sinhμ is actually μ=ε+½Δε from metric B2A. For local Δε contribution 2ε can then be normalized out so object B simply creates a background metric where g_{oo}→ constant as r→∞ replacing sinhμ (So -sinhμ can be set to 0.). Object B contributes both the complete frame dragging (Schwarzchild ω=0 limit of Kerr rotation) and the much smaller drop in frame dragging due to object B being nearby. So this then gives the N=1 local Δε contribution to what N=2 sees (already did this for nonlocal ε).

N=2 sees local Δε nonrotating and rotating contribution of object B

Object B N=1 ambient metric C=constant (nonrotating)

From eqs17-18 but with ambient metric ansatz: $ds^2=-e^{\lambda}(dr)^2-r^2d\theta^2-r^2\sin\theta d\phi^2+e^{\mu}dt^2$ (B3)

so that $g_{oo}=e^{\mu}$, $g_{rr}=e^{\lambda}$. From eq. R_{ij}=0 for spherical symmetry in free space and N=0

$R_{11}=\frac{1}{2}\mu''-\frac{1}{4}\lambda'\mu'+\frac{1}{4}(\mu')^2-\lambda'/r=0$ (B4)

$R_{22}=e^{-\lambda}[1+\frac{1}{2}r(\mu'-\lambda')]-1=0$ (B5)

$R_{33}=\sin^2\theta\{e^{-\lambda}[1+\frac{1}{2}r(\mu'-\lambda')]-1\}=0$ (B6)

$R_{oo}=e^{\mu-\lambda}[-\frac{1}{2}\mu''+\frac{1}{4}\lambda'\mu'-\frac{1}{4}(\mu')^2-\mu'/r]=0$ (B7)

$R_{ij}=0$ if i≠j

(eq. B4-B7 from pp.303 Sokolnikof(8)): Equation B4 is a mere repetition of equation B6. We thus have only three equations on λ and μ to consider. From equations B4, B7 we deduce that λ'=-μ' so that radial λ=-μ+constant =-μ+C where C represents a possible ~constant ambient metric contribution which (allowing us to set sinhμ=0) could be imaginary in the case of the slowly oscillating ambient metric of nearby object B from B2. So $e^{-\mu+C}=e^{\lambda}$. Then B3-B7 can be written as: $e^{-C}e^{\mu}(1+r\mu')=1$. (B9)

Set $e^{\mu}=\gamma$. So $e^{-\lambda}=\gamma e^{-C}$ ε and Δε are time dependent. So integrating this first order equation (equation B9) we get: $\gamma=-2m/r+e^{C}\equiv e^{\mu}=g_{oo}$ and $e^{-\lambda}=(-2m/r+e^{C})e^{-C}=1/g_{rr}$ or $e^{-\lambda}=1/\kappa_{rr}=1/(1-2m'/r)$, $2m/r+e^{C}=\kappa_{00}$. With (reduced mass ground state rotater (Δε/2) for charged if -ε) dr zitterbewegung from B1 $\kappa_{rr}dr^2=e^{C}\kappa_{00}dr'^2=e^{i(-\varepsilon+\Delta\varepsilon/2)2}\kappa_{00}dr^2$ from B2. We found

$$\kappa_{00}=e^{C}-2m/r=e^{i(-\varepsilon+\Delta\varepsilon/2)2}-2m/r \qquad \text{(B10)}$$

Δε here is reduced ground state mass Δε/2 as in Schrodinger eq $E=\Delta\varepsilon/2=1/\sqrt{\kappa_{00}}$. (B10a) does not add anything to r_H/r in κ_{rr} since e^C is not added to r_H/r there.

Add **Perturbative Kerr** rotation **$(a/r)^2$ to r_H/r in κ_{rr}** Here nothing gets added to r_H/r in κ_{oo}

Our new pde has spin S and so the self similar ambient metric on the N=0 th fractal scale is the Kerr metric which contains those ambient metric **perturbation rotations** (dθdt T violation so (given CPT) then **CP violation)**

$$ds^2=\rho^2\left(\frac{dr^2}{\Delta}+d\theta^2\right)+\left(r^2+a^2\right)\sin^2\theta d\phi^2-c^2dt^2+\frac{2mr}{\rho^2}\left(a\sin^2\theta d\theta-cdt\right)^2, \qquad \text{(B11)}$$

where $\rho^2(r,\theta)\equiv r^2+a^2\cos^2\theta$; $\Delta(r)\equiv r^2-2mr+a^2$, In our 2D dϕ=0, dθ =0 Define:

$$\left(\frac{r^2+a^2cos^2\theta}{r^2-2mr+a^2}\right)dr^2+\left(1-\frac{2m}{r^2+a^2cos^2\theta}\right)dt^2 \quad \theta\neq 0$$

$\rho^2(r,\theta)\equiv r^2+a^2\cos^2\theta$; $\Delta(r)\equiv r^2-2mr+a^2$, $r\hat{}^2\equiv r^2+a^2\cos^2\theta$, $r'^2\equiv r^2+a^2$ .Inside r_H a<<r, r>>2m

$$\left(\frac{(r\hat{})^2}{(r')^2-2mr}\right)dr^2+\left(1-\frac{2mr}{(r\hat{})^2}\right)dt^2+..=\left(\frac{1}{\frac{(r')^2}{(r\hat{})^2}-\frac{2mr}{(r\hat{})^2}}\right)dr^2+\left(1-\frac{2mr}{(r\hat{})^2}\right)dt^2.$$

The $(r\hat{}/r')^2$ term is $\frac{(r')^2}{(r\hat{})^2}=\frac{r^2+a^2}{r^2+a^2cos^2\theta}=\frac{1+\frac{a^2}{r^2}}{1+\frac{a^2}{r^2}cos^2\theta}\approx 1/g_{rr}(\approx g_{oo})$

$$=\left(1+\frac{a^2}{r^2}\right)\left(1-\frac{a^2}{r^2}cos^2\theta\right)+..=1-\frac{a^4}{r^4}cos^2\theta-\frac{a^2}{r^2}cos^2\theta+\frac{a^2}{r^2}+..=1+\frac{a^2}{r^2}(1-cos^2\theta)+.=$$

$$1+\frac{a^2}{r^2}sin^2\theta+..\equiv 1+\left(\frac{a}{r}\right)^2u^2=\left(\text{from fig. 6 mass}=\frac{C_M}{\delta z\delta z}\right)=1+(\varepsilon+\Delta\varepsilon)+.. \qquad \text{(B12)}$$

since ε+Δε are time dependent, and add 2m/r to this 1+ε+Δε at the end. Δε is *total* (Mandlebulb) mass as in $C_M/(\delta z\delta z)=(a/r)^2$ in fig6 contribruting to inertial frame dragging drop

We can normalize out 1+ε over a region we know it is (at least appromately) a constant. That in turn makes the metric coefficients at r>>>0 flat which is what they should be. In contrast rotation adds to κ_{rr} (B12) and only oblates 2m/r in κ_{oo}.

Summary: Our Newpde metric including the effect of object B (with $\tau+\mu=2m_p=\xi_1$.) is for the τ+μ+e Mandelbulbs in Fig6

τ+μ in free space $r_H=e^2 10^{40(0)}/2m_P c^2$, $\kappa_{00}=e^{i(\Delta\varepsilon/(1-2\varepsilon))}-r_H/r$, $\kappa_{rr}=1+\Delta\varepsilon/(1+\varepsilon)-r_H/r$ Leptons (B13)

$\tau+\mu$ on $2P_{3/2}$ sphere at $r_H=r$, $r_H=e^2 10^{40(0)}/2m_ec^2$,comoving with $\gamma=m_p/m_e$. Baryons, part2 (B14)
Imaginary $i\Delta\varepsilon$ in this cosmological background metric $\kappa_{00}=e^{i\Delta\varepsilon}$ B13 makes no contribution to the Lamb shif but is the core of partIII cosmological application $g_{oo}=\kappa_{oo}$ of eq B13 of this paper.

B3 N=0 eq.B13 Application example: anomalous gyromagnetic ratio Separation Of Variables On New Pde.

After separation of variables the "r" component of Newpde can be written as:

$$\left[\left(\frac{dt}{ds}\sqrt{\kappa_{00}}m_p\right)+m_p\right]F-\hbar c\left(\sqrt{\kappa_{rr}}\frac{d}{dr}+\frac{j+3/2}{r}\right)f=0 \qquad \text{B15}$$

$$\left[\left(\frac{dt}{ds}\sqrt{\kappa_{00}}m_p\right)-m_p\right]f+\hbar c\left(\sqrt{\kappa_{rr}}\frac{d}{dr}-\frac{j-1/2}{r}\right)F=0. \qquad \text{B16}$$

Using the above Dirac equation component we find the anomalous gyromagnetic ratio Δgy for the spin polarized F=0 case. Recall the usual calculation of rate of the change of spin S gives $dS/dt\propto m\propto gyJ$ from the Heisenberg equations of motion. We note that $1/\sqrt{\kappa_{rr}}$ rescales dr in $\left(\sqrt{\kappa_{rr}}\frac{d}{dr}+\frac{j+3/2}{r}\right)f$ in equation B15 with κ_{rr} from B13. Thus to have the same rescaling of r in the second term we must multiply the second term denominator (i.e.,r) and numerator (i.e., J+3/2) each by $1/\sqrt{\kappa_{rr}}$ and set the numerator ansatz equal to $(j+3/2)/\sqrt{\kappa_{rr}}\equiv 3/2+J(gy)$, where gy is now the gyromagnetic ratio. This makes our equation B15, B16 compatible with the standard Dirac equation allowing us to substitute the gy into the Heisenberg equations of motion for spin S: $dS/dt\propto m\propto gyJ$ to find the correction to dS/dt. Thus again:

$[1/\sqrt{\kappa_{rr}}](3/2+J)=3/2+Jgy$, Therefore for J= ½ we have:
$[1/\sqrt{\kappa_{rr}}](3/2+½)=3/2+½gy= 3/2+½(1+\Delta gy)$ B17

Then we solve for Δgy and substitute it into the above dS/dt equation.
Thus solve eq. B17 with Eq.B1 values in $\sqrt{\kappa_{rr}}= 1/\sqrt{(1+\Delta\varepsilon/(1+\varepsilon))}= 1/\sqrt{(1+\Delta\varepsilon/(1+0))}= 1/\sqrt{(1+.0005799/1)}$. Thus from equation B1:
$[\sqrt{(1+.0005799)}](3/2+½)= 3/2+½(1+\Delta gy)$. Solving for Δgy gives anomalous gyromagnetic ratio correction of the electron $\Delta gy=.00116$.
If we set $\varepsilon\neq 0$ (so $\Delta\varepsilon/(1+\varepsilon)$) instead of $\Delta\varepsilon$) in the same κ_{oo} in Newpde we get the anomalous gyromagnetic ratio correction of the muon in the same way.

Composite 3e: Meisner effect For B just outside r_H. (where the zero point energy particle eq. 9.22 is $.08=\pi^{\pm}$) See B14

Composite 3e CASE 1: Plus $+r_H$, therefore is the proton + charge component. Eq.B14: $1/\kappa_{rr} =1+r_H/r_H +\varepsilon'' = 2+ \varepsilon''$. $\varepsilon''=.08$ (eq.9.22). Thus from eq.B17 $\sqrt{2+\varepsilon''}(1.5+.5)=1.5+.5(gy)$, gy=2.8
The gyromagnetic ratio of the proton
Composite 3e CASE 2: negative r_H, thus charge cancels, zero charge:
$1/\kappa_{rr} =1-r_H/r_H +\varepsilon''= \varepsilon''$ Therefore from equation B17 and case 1 eq.B13 $1/\kappa_{rr} =1-r_H/r_H+\varepsilon''$
$\sqrt{\varepsilon''}(1.5+.5)=1.5+.5(gy)$, gy=-1.9.
the **gyromagnetic ratio of the neutron** with the other charged and those ortho neutral hyperon magnetic moments scaled using their masses by these values respectively.

B4 eq.B13 κ_{00} application example: Lamb shift

After separation of variables the "r" component of Newpde can be written as

$$\left[\left(\frac{dt}{ds}\sqrt{\kappa_{00}}m_p\right)+m_p\right]F-\hbar c\left(\sqrt{\kappa_{rr}}\frac{d}{dr}+\frac{j+3/2}{r}\right)f=0 \qquad \text{B18}$$

$$\left[\left(\frac{dt}{ds}\sqrt{\kappa_{00}}m_p\right) - m_p\right] f + \hbar c\left(\sqrt{\kappa_{rr}}\frac{d}{dr} - \frac{j-1/2}{r}\right) F = 0. \qquad B19$$

Comparing the flat space-time Dirac equation to the left side terms of equations B18 and B19:

$(dt/ds)\sqrt{\kappa_{oo}}=(1/\kappa_{00})\sqrt{\kappa_{oo}}=(1/\sqrt{\kappa_{oo}})$=Energy=E B20

Note for electron motion around hydrogen proton $mv^2/r=ke^2/r^2$ so $KE=½mv^2= (½)ke^2/r$ =PE potential energy in PE+KE=E. So for the electron (but not the tauon or muon that are not in this orbit) $PE_e=½e^2/r$. Write the hydrogen energy and pull out the electron contribution B10a. So in eq.B2 and B18 $r_{H'}=(1+1+.5)e^2/(m_\tau+m_\mu+m_e)/2=2.5e^2/(2m_pc^2)$. B21

Variation δ(ψ*ψ)=0 At r=n²aₒ

Next note for the variation in ψ*ψ is equal to zero at maximum ψ*ψ probability density where for the hydrogen atom is at $r=n^2a_o=4a_o$ for n=2 and the $\psi_{2,0,0}$ eigenfunction. Also recall eq.B4 eq.11a$\xi_1=m_Lc^2=(m_\tau+m_\mu+m_e)c^2=2m_pc^2$ normalizes $½ke^2$ (Thus divide τ+μ by 2 and then multiply the whole line by 2 to normalize the $m_e/2$.result. ε=0 since no muon ε here.): Recall in eeq.11a ξ_o has to be pulled in a Taylor expansion as an operator since it a separate observable. So substituting eqs.B1 for κ_{00}, values in eq.B20:

$$E_e = \frac{(tauon+muon)(\frac{1}{2})}{\sqrt{1-\frac{r_{H'}}{r}}} - \left(tauon + muon + PE_\tau + PE_\mu - m_ec^2\right)\frac{1}{2} =$$

$$2(m_\tau c^2 + m_\mu c^2)\frac{1}{2} + 2\frac{m_ec^2}{2} + 2\frac{2.5e^2}{2r(m_Lc^2)}m_Lc^2 - 2\frac{2e^2}{2r(m_Lc^2)}m_Lc^2 - 2\frac{3}{8}\left(\frac{2.5e^2}{rm_Lc^2}\right)^2 m_Lc^2 - 2(m_\tau c^2 + m_\mu c^2)\frac{1}{2}$$

$$= \frac{2m_ec^2}{2} + 2\frac{e^2}{4r} - 2\frac{3}{8}\left(\frac{2.5}{rm_Lc^2}\right)^2 m_Lc^2 = m_ec^2 + \frac{e^2}{2r} - 2\frac{3}{8}\left(\frac{2.5e^2}{rm_Lc^2}\right)^2 m_Lc^2$$

So: $\Delta E_e = 2\frac{3}{8}\left(\frac{2.5}{rm_Lc^2}\right)^2 m_Lc^2$ = (Third order $\sqrt{\kappa_{\mu\mu}}$ Taylor expansion term)=

$$\Delta E = 2\frac{3}{8}\left[\frac{2.5(8.89X10^9)(1.602X10^{-19})^2}{(4(.53X10^{-10}))2((1.67X10^{-27})(3X10^8)^2}\right]^2(2(1.67X10^{-27})(3X10^8)^2$$

$=hf=6.626X10^{-34}$ 27,360,000 so that f=27MHz Lamb shift.

The other 1050Mhz comes from the zitterbewegung cloud.

Note: Need infinities if **flat space Dirac 1928 equation**. For flat space $\partial g_{ik}/\partial x^j=\mathbf{0}$ as a limit. Then must take field $g^{km}=1/0=\infty$ to get finite Christoffel symbol $\Gamma^m_{ij}\equiv(g^{km}/2)(\partial g_{ik}/\partial x^j+\partial g_{jk}/\partial x^i-\partial g_{ij}/\partial x^k)=(1/\mathbf{0})(\mathbf{0})$=*un*defined but still implying *non*zero acceleration on the left side of the geodesic equation: $\frac{d^2x^\mu}{ds^2} = -\Gamma^\mu_{\nu\lambda}\frac{dx^\nu}{ds}\frac{dx^\lambda}{ds}$ So we need infinite fields for flat space. Thus QED requires (many such) infinities. But we have in general curved space $g_{ij}=\kappa_{ij}$ in the New pde so do not require that anything be infinite and yet we still obtain for the third order Taylor expansion term of $\sqrt{\kappa_{\mu\nu}}$ the Lamb shift and anomalous gyromagnetic ratio correction (see above sections B3,B4).

So renormalization is a perturbative way (given it's flat space Dirac equation and minimal interaction gauge origins) of calculating these (above) same, *NON*perturbative results, it's a perturbative GR theory. But renormalization gives lots of wrong answers too, eg.,10^{96}grams/cm^3 vacuum density for starters. (So we drop it here since we don't need it any longer for the high precision QED results.) In contrast note near the end of reference 5 our $G_{oo}=0$ for a 2D MS. Thus a vacuum really is a vacuum. Also that large $\xi_1=\tau(1+\varepsilon')$ in r_H in eq.B13,11a is the reason leptons appear point particles (in contrast to the small ξ_0 in the composite 3e baryons).

B5 eq.B13 κ_{00} application example: metric quantization from $g_{oo}=\kappa_{00}$

Given the subatomic fractal scale is dominated by quantum mechanics phenomena in a fractal universe the next higher N=1 fractal scale should bring the QM back: In galaxy halos $g_{00}=\kappa_{oo}$ (eq.4.13) with resulting Metric Quantization N=1 result $g_{oo}=\kappa_{oo}$,in galaxy halos (eg.,replacing need for dark matter Note we have yet to use the $e^{i(\Delta\varepsilon/(1-2\varepsilon))}$ in $\kappa_{00}=e^{i(\Delta\varepsilon/(1-2\varepsilon))}-r_H/r$ of equation B13. $mv^2/r=GMm/r^2$ is always true (eg.,globulars orbiting out of plane) but so is $g_{oo}=\kappa_{00}$ *in the plane* of a flattened galaxy (rotating central black hole planar effect partIII). That $g_{oo}=\kappa_{oo}$ in the *halo of the Milky Way galaxy* is the fundamental equation of metric quantization. So again $mv^2/r=GMm/r^2$ so $GM/r=v^2$ COM in the galaxy halo(circular orbits) $(1/(1-2\varepsilon)$ term from κ_{00} in B13) so

Pure state $\Delta\varepsilon$ (ε *excited* $1S_{½}$ state of ground state $\Delta\varepsilon$, so not same state as $\Delta\varepsilon$)

$\mathrm{Rel}\kappa_{oo}=\cos\mu$ from B13 κ_{00}

Case1 $1-2GM/(c^2r)=1-2(v/c)^2=1-(\Delta\varepsilon/(1-2\varepsilon))^2/2$ (B22)

So $1-2(v/c)^2=1-(\Delta\varepsilon/(1-2\varepsilon))^2/2$ so $=(\Delta\varepsilon/(1-2\varepsilon))c/2=.00058/(1-(.06)2)(3X10^8)/2$ =99km/sec $\approx$100km/sec (Mixed $\Delta\varepsilon,\varepsilon$, states classically here are grand canonical ensembles with nonzero chemical potential.). For ringed (not hub) galaxies the radial value becomes 100/2=50km/sec. Also $v=(\Delta\varepsilon/(1-2\varepsilon))c/2$ so v/c=constant.

Mixed state $\varepsilon\Delta\varepsilon$ (Again $GM/r=v^2$ so $2GM/(c^2r)=2(v/c)^2$.)

Case 2 $g_{oo}=1-2GM/(c^2r)=\mathrm{Rel}\kappa_{oo}=\cos[\Delta\varepsilon+\varepsilon]=1-[\Delta\varepsilon+\varepsilon]^2/2=1-[(\Delta\varepsilon+\varepsilon)^2/(\Delta\varepsilon+\varepsilon)]^2/2=$ $1-[(\Delta\varepsilon^2+\varepsilon^2+2\varepsilon\Delta\varepsilon)/(\Delta\varepsilon+\varepsilon)]^2$

The $\Delta\varepsilon^2$ is just the above first case (Case 1) so just take the mixed state cross term $[\varepsilon\Delta\varepsilon/(\varepsilon+\Delta\varepsilon))]= c[\Delta\varepsilon/(1+\Delta\varepsilon/\varepsilon))]/2=c[\Delta\varepsilon+\Delta\varepsilon^2/\varepsilon+...\Delta\varepsilon^{N+1}/\varepsilon^N+.]/2=\Sigma v_N$. Note each term in this expansion is itself a (mixed state) operator. So there can't be a single v in the large gradient 2nd case so in the equation just above we can take $v_N=[\Delta\varepsilon^{N+1}/(2\varepsilon^N)]c$. (B23)

From eq. B23 for example $v=m100^N$km/sec. m=2,N=1 here (Local arm). In part III we list hundreds of examples of B23: (sun1,2km/sec, galaxy halos m100km/sec). The linear mixed state subdivision by this ubiquitous ~100 scale change factor in r_{bb} (due to above object B zitterbewegung spherical Bessel function resonance boundary conditions resulting in nodes) created the voids. Same process for N-1 (so 100X smaller) antinodes get galaxies, 100Xsmaller: globular clusters, 100Xsmaller solar systems, etc., So these smaller objects were also created by mixed state metric quantization (eq.B23) resonance oscillation inside initial radius r_{bb}.

We include the effects of that object B drop in inertial frame dragging on the inertial term m in the Gamow factor and so lower Z nuclear synthesis at earlier epochs (t>18by)BCE. (see partIII)

Appendix C. Object C

orthogonal axis' to orthogonal axis extreme rotations in equation 12

Recall from sect.1 eq.3 that $\delta C=\delta(\delta z+\delta z\delta z)=\delta\delta\delta\delta z(1)+\delta\delta z(\delta z)+(\delta z)\delta\delta z=\delta C=0$ so C is split between $\delta\delta z$ noise and $\delta z\delta z$ and classical ds^2 proper time. Note for N=1 $|\delta z|>>1$ and $C_M>>1$. So eq.5 holds then. So for high energies as γ is boosted observer $\delta z/\gamma$, C/γ gets smaller than the huge N=1 scale (so higher energy, smaller wavelength beam probes) $\delta\delta z(1)/ds$ noise angle gets relatively larger (relative to $\delta(\delta z \delta z)/ds$, sect.1) until finally the next smaller (and next smaller one after that at N=-1) is the N=0 fractal scale

Large rotation angle $\delta\delta z/ds$ can then be large axis' extreme ±45° min ds and so two possible 45° rotations so through a total of two quadrants for ±δz' in eq.12.(a single δz just gives e,*ν* back) One such rotation around a axis (SM) and the other around a diagonal (SC).

These rotations are

I→II, II→III,III→IV,IV→I required extremum to eq.16 extremum rotations in eq.7-9 plane Give SM Bosons at high interaction COM energies(where δδz gets big). N_{ob} =0

Note in fig.3 dr,dt is also a rotation. and so has an eq.11 rotation operator observable θ. Thus from equation 11 for (θ) angle rotations $\theta\delta z \equiv (dr/ds)\delta z = -i\partial(\delta z)/\partial r$ for the first 45°rotation. So we got through one Newpde derivative for each 45° rotation. For the next 45° rotation in fig.4 it is then a second derivative $\theta\theta\delta z' = e^{i\theta p}e^{i\theta'}\delta z = e^{i(\theta p+\theta)}\delta z = (dr/ds)((dr/ds)dr') = -i\partial(-i\partial(dr'))/\partial r)\partial r = -\partial^2(dr')/\partial r^2$ large angle rotation in figure 3. In contrast for z=1, δz' small so 45°-45° small angle rotation in figure 3 (so then N=-1). Do the same with the time t and get for z=0 rotation of 45°+45° (fig.4) then $\theta\theta\delta z' = (d^2/dr^2)z' + (d^2/dt^2)\delta z'$ (C1)

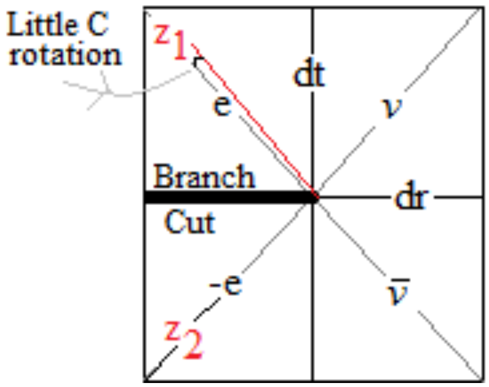


fig.3

fig.3. for **45°-45°** So two body (e,ν) singlet ΔS=½-½ =0 component so pairing interaction (sect.4.5).Also ortho ΔS=½+½=1 making 2 body (at $r=r_H$) S=1 Bosons and so a field theory. Note we also get these Laplacians characteristic of the Boson field equations by those 45°+45° rotations so eq.16 implies Bosons accompany our leptons (given the δz'), **so these leptons exhibit "force".**

Newpde $r=r_H$, z=0, 45°+45 rotation of composites e,*ν* implied by Equation 12

So z=0 allows a large C z rotation application from the 4 different axis' max extremum (of eq.16) branch cuts gives the 4 results: Z,+-W, photon bosons of the Standard Model. So we have derived the Standard Model of particle physics in this very elegant way (from the four axis'). You are physically at $r=r_H$ if you rotate through the electron quadrants (I, IV).of eq.7-9. So we have large C_M dichotomic 90° rotation to the next Reimann surface of eq.12, eq.A1 $(dr^2+dt^2)z''$ from some initial extremum angle(s) θ. Eq.16 solutions imply complex 2D plane Stern Gerlach dichotomic rotations using eq.A1 thereby using Pauli matrices σ_i algebra, which maps one-to-one to the quaternionA algebra. Using eq.12 we start at some initial angle θ and rotate by 90° the noise rotations are: $C=\delta z'' = [e_L, \nu_L]^T \equiv \delta z'(\uparrow)+\delta z'(\downarrow) \equiv \psi(\uparrow)+\psi(\downarrow)$ has a eq.12 infinitesimal unitary generator $\delta z'' \equiv U = 1-(i/2)\varepsilon n^*\sigma)$, $n \equiv \theta/\varepsilon$ in $ds^2 = U^t U$. But in the limit $n \to \infty$ we find, using elementary calculus, the result $\exp(-(i/2)\theta^*\sigma) = \delta z''$. We can use any axis as a branch cut since all 4 are eq.20 large extremum so for the 2nd rotation we move the branch cut 90° and measure the angle off the next diagonal since Pauli matrix dichotomic rotations are actually axis rotations,

leaving our e and v directions the same. In any case (dr+dt)z''in eq.16 can then be replaced by eq.A1 $(dr^2+dt^2+..)\delta z'' = (dr^2+dt^2+..)e^{quaternionA}$Bosons because of eq.C1.
C2 Then use eq. 12 and quaternions to rotate δz" since the quaternion formulation is isomorphic to the Pauli matrices. $dr' = \delta z_r = \kappa_{rr} dr$ for **Quaternion** A $\kappa_{ii} = e^{iAi}$.

Appendix C Quaternion ansatz $\kappa_{rr} = e^{iAr}$ instead of $\kappa_{rr} = (dr/dr')^{2.}$ in eq.14. N=0.
C1 for the eq.12:large θ= 45°+45° rotation (for N=0 so large $\delta z' = \theta r_H$). Instead of the equation 13,15 formulation of κ_{ij} for small δz' (z=1) and large θ=45°+45° we use A_r in dr direction with $dr^2 = x^2 + dy^2 + dz^2$. So we can again use 2D (dr,dt)) $E = 1/\sqrt{\kappa_{oo}} = 1/\sqrt{e^{iAi}}. = e^{i\text{-}A/2}$. The 1 is mass energy and the first real component after that in the Taylor expansion is field energy A^2. For 2 particles together the other particle ε negative means r_H is also negative. Since it is $e_1 * e_2 = r_H$. So $1/\kappa_{rr} = 1 + (-\varepsilon + r_H/r)$ is ± and $1 - (-\varepsilon + r_H/r)$ 0 charge. (C0)
For baryons with a 3 particle r_H/r may change sign without third particle ε changing sign so that at $r = r_H$. Can normalize out the background ε in the denominator of $E = (\tau+\varepsilon)/\sqrt{(1+\varepsilon+\Delta\varepsilon - r_H/r)}$ for Can normalize out the background ε in the denominator of $E = (\tau+\varepsilon)/\sqrt{(1+\varepsilon+\Delta\varepsilon - r_H/r)}$ for small conserved (constant) energies $1/\sqrt{(1+\varepsilon)}$ and (so $E = (1/\sqrt{(1+x)}) = 1 - x/2 +$) large r (so large λ so not on r_H)implies the normalization is:
$E = (\varepsilon+\tau)/\sqrt{((1-\varepsilon/2-\varepsilon/2)/(1\pm\varepsilon/2))}$, J=0 para e,$\nu$ eq.9.23 $\pi^{\pm}, \pi^o$. For large $l/\sqrt{\Delta\varepsilon}$ energies given small $r = r_H$, Here 1+ε is locally constant so can be normalized out as in

$$E = (\varepsilon+\tau)/\sqrt{(1 - (\Delta\varepsilon/(1\pm\varepsilon)) - r_H/r)}, \text{ for charged if -, ortho e,}\nu\ J=1, W^{\pm}, Z_o \quad (11d)$$

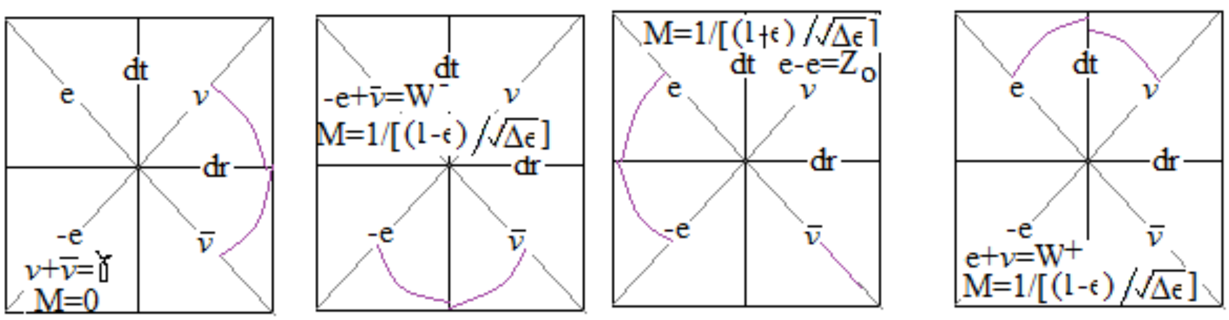


fig4
Fig.4 applies to eq.9 **45°+45°**=90° case: **Bosons.**
C2 These quadrants were defined in eq.7-9 and used in eq.12. The Appendix C4 derivation applies to the far right side figure. Recall from eq.16 z=0 result C_M=45°+45°=90°, gets Bosons. 45°-45°= leptons. The ν in quadrants II(eq.5) and III (eq.9). e in quadrants I (eq.7) and IV (eq.7). Locally normalize out 1+ε (appendix D). For the **composite e,ν** on those required large z=0 eq.9 rotations for C→0, and for stability $r = r_H$ (eg.,for $2P_{1/2}$, I→II, III→IV,IV→I) unless $r_H = 0$ (II→III)

Example:
C4 Quadrants IV→I rotation eq.C2 $(dr^2+dt^2+..)e^{quaternion\ A}$ =rotated through C_M in eq.16. example C_M in eq.C1 is a 90° CCW rotation from 45° through ν and anti ν
A is the 4 potential. From eq.17 we find after taking logs of both sides that $A_o = 1/A_r$ (A2)
Pretending we have a only two i,j quaternions but still use the quaternion rules we first do the r derivative: From eq. C1 $dr^2\delta z = (\partial^2/\partial r^2)(\exp(iA_r + jA_o)) = (\partial/\partial r[(i\partial A_r \partial r + \partial A_o/\partial r)(\exp(iA_r + jA_o)]$
$= \partial/\partial r[(\partial/\partial r)iA_r + (\partial/\partial r)jA_o)(\exp(iA_r + jA_o) + [i\partial A_r/\partial r + j\partial A_o/\partial r]\partial/\partial r(iA_r + jA_o)(\exp(iA_r + jA_o) +$
$(i\partial^2 Ar/\partial r^2 + j\partial^2 A_o/\partial r^2)(\exp(iA_r + jA_o) + [i\partial A_r/\partial r + j\partial A_o/\partial r][i\partial A_r/\partial r + j\partial/\partial r(A_o)] \exp(iA_r + jA_o)$ (A3)

Then do the time derivative second derivative $\partial^2/\partial t^2(\exp(iA_r+jA_o)$ =$(\partial/\partial t[(i\partial A_r\partial t+\partial A_o/\partial t)$ $(\exp(iA_r+jA_o)]=\partial/\partial t[(\partial/\partial t)iA_r+(\partial/\partial t)jA_o)(\exp(iA_r+jA_o)+$ $[i\partial A_r/\partial r+j\partial A_o/\partial t]\partial/\partial r(iA_r+jA_o)(\exp(iA_r+jA_o)$ $+(i\partial^2A_r/\partial t^2 +j\partial^2A_o/\partial t^2)(\exp(iA_r+jA_o)$ $+[i\partial A_r/\partial t+j\partial A_o/\partial t][i\partial A_r/\partial t+j\partial/\partial t(A_o)]\exp(iA_r+jA_o)$ (C4)

Adding eq. C2 to eq. C4 to obtain the total D'Alambertian C3+C4=

$[i\partial^2A_r/\partial r^2+i\partial^2A_r/\partial t^2]+ [j\partial^2A_o/\partial r^2+j\partial^2A_o/\partial t^2]+ii(\partial Ar/\partial r)^2+ ij(\partial A_r/\partial r)(\partial A_o/\partial r)$ $+ji(\partial A_o/\partial r)(\partial A_r/\partial r)+jj(\partial A_o/\partial r)^2 ++ii(\partial Ar/\partial t)^2+ij(\partial A_r/\partial t)(\partial A_o/\partial t)+ji(\partial A_o/\partial t)(\partial A_r/\partial t)+jj(\partial A_o/\partial t)^2$.

Since ii=-1, jj=-1, ij=-ji the middle terms cancel leaving $[i\partial^2Ar/\partial r^2+i\partial^2Ar/\partial t^2]+$ $[j\partial^2A_o/\partial r^2+j\partial^2A_o/\partial t^2]+ii(\partial Ar/\partial r)^2+jj(\partial A_o/\partial r)^2 +ii(\partial Ar/\partial t)^2+jj(\partial A_o/\partial t)^2$

Plugging in C2 and C4 gives us cross terms $jj(\partial A_o/\partial r)^2+ii(\partial Ar/\partial t)^2 = jj(\partial(-A_r)/\partial r)^2+ii(\partial Ar/\partial t)^2$ =0. So $jj(\partial A_r/\partial r)^2 =- jj(\partial A_o/\partial t)^2$ or taking the square root: $\partial A_r/\partial r + \partial A_o/\partial t=0$ (C5)

$i[\partial^2A_r/\partial r^2+i\partial^2A_r/\partial t^2]=0$, $j[\partial^2A_o/\partial r^2+i\partial^2A_o/\partial t^2]=0$ or $\partial^2A_\mu/\partial r^2+\partial^2A_\mu/\partial t^2+..=1$ (C6)

A4 and A5 are **Maxwell's equations** (Lorentz gauge formulation) in free space, if μ=1,2,3,4.

$$\Box^2A_\mu=1,\ \Box\bullet A_\mu=0 \quad \text{(C7)}$$

This looks like the Lorentz gauge formalism but it is actually a fundamental field equation (not interchangeable with some other as in gauge theories) hence it is *no gauge at all* and we have also avoided the Maxwell overdeterminism problem (8eq, ,6 unknowns E_i,B_i.). Must use Newpde 4D orthogonalization here. Amplitudes of physical processes in QED in the noncovariant Coulomb gauge coincide with those in the covariant Lorenz gauge. The Aharonov–Bohm effect depends on a line integral of **A** around a closed loop, and this integral is not changed by A→A+∇ψ which doesn't change B=∇XA either. So formulation in the Lorentz gauge mathematics works (but again 6.7 is no longer a gauge).

C5 Other 45°+45° Rotations (Besides above quadrants IV→I)

Proca eq

In the 1st to 2nd, 3rd to 4th quadrants the A_u is already there as a single *v* in the rotation the mass is in both quadrants and in the end we wmultiply by the A_u so get the $m^2A_u^2$ term in the Proca eq.for the W^+,W^-. The mass still gets squared for the 2nd to 3rd quadrant rotation Z_o..

For the **composite e,*v*** on those required large z=0 eq.16 rotations for C≈0, and for stability $r=r_H$ for $2P_{½}$ (I→II, III→IV,II→III) unless r_H=0 (IV→I) are:

Ist→IInd quadrant rotation is the W+ at **r=r$_H$**. Do similar math to C2-C7 math and get instead a Proca equation The limit ε→1=τ (D13) in ξ_1 at $r=r_H$.since Hund's rule implies $\mu=\varepsilon=1S_{½} \le 2S_{½}=$ τ=1. So the ε is negative in Δε/(1-ε) as in case 1 charged as in appendix A1 case 2.

$E=1/\sqrt{(\kappa_{oo})} -1=[1/\sqrt{(1-\Delta\varepsilon/(1-\varepsilon)-r_H/r)}]-1=[1/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}]-1$. $E_t=E+E=2/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}$=W+ mass.

E_t=E-E gives E&M that also interacts weakly with weak force.

IIIrd →IV quadrant rotation is the W-. Do the math and get a Proca equation again.

$E=1/\sqrt{(\kappa_{oo})} -1=[1/\sqrt{(1-\Delta\varepsilon/(1-\varepsilon)-r_H/r)}]-1=[1/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}]-1$. $E_t=E+E=2/\sqrt{(\Delta\varepsilon/(1-\varepsilon))}$=W- mass.

E_t=E-E gives E&M that also interacts weakly with weak force.

II → III quadrant rotation is the Z_o. Do the math and get a Proca equation. C_M charge cancelation. B14 gives 1/(1+ε) gives 0 charge since ε→1 to case 1 in appendix C2.

$E=1/\sqrt{(\kappa_{oo})} -1=[1/\sqrt{(1-\Delta\varepsilon/(1+\varepsilon)-r_H/r)}]-1=[1/\sqrt{(\Delta\varepsilon/(1+\varepsilon))}]-1$. $E_t=E+E=2/\sqrt{(\Delta\varepsilon/(1+\varepsilon))}-1=Z_o$ mass.

E_t=E-E gives E&M that also interacts weakly with weak force. Seen in small left handed polarization rotation of light.

IV→I quadrant rotation through those 2 neutrinos gives 2 objects. $r_H=0$

E=1/√κ_{oo} -1=[1/√(1-Δε/(1+ε)]-1=Δε/(1+ε). Because of the +- square root E=E+-E so E rest mass is 0 or Δε=(2Δε)/2 reduced mass.

Et=E+E=2E=2Δε is the pairing interaction of SC. The E_t=E-E=0 is the 0 rest mass photon Boson. Do the math (eq.C2-C7) and get Maxwell's equations. Note there was no charge C_M on the two v s.Note we get SM particles out of composite e,v using required eq.9 rotations for

C6 Object B Effect On Inertial Frame Dragging (from appendix B)

The fractal implications are that we are inside a cosmological positron inside a proton $2P_{3/2}$ at $r=r_H$ state. The cosmological object (electron) we are inside of is a positron and call it object A which orbits electron object B with a given distant 3rd object C. Object B is responsible for the mass of the electron since it's frame dragging creates that Kerr metric $(a/r)^2=m_ec^2$ (B9) result used in eq.D9. So Newpde ground state $m_ec^2 \equiv\langle H_e\rangle$ is the fundamental Hamiltonian eigenvalue defining idea for composite e,v, $r=r_H$ implying Fermi 4 point E= ∫$\psi^tH\psi$dV= ∫$\psi^t\psi$HdV= ∫$\psi^t\psi$G Recall for composite e,v all interactions occur inside r_H $(4\pi/3)\lambda^3=V_{rH}$. $\frac{1}{V^{1/2}}=\psi_e=\psi_3\frac{1}{V^{1/2}}=\psi_v=\psi_4$ so 4pt $\iiint_0^{r_{rH}}\psi_1\psi_2\psi_3\psi_4 dV=2G\iiint_0^{r_H}\psi_1\psi_2\frac{1}{V^{1/2}}\frac{1}{V^{1/2}}V$

$$\equiv\iiint_0^{r_H}\psi_1\psi_2 G\equiv\iiint_0^{r_H}\psi_1\psi_2(2m_ec^2)dV_{rH}=\iiint_0^{V_{rH}}\psi_1(2m_ec^2)\psi_2 dV_{r_H}\quad\text{(A8)}$$

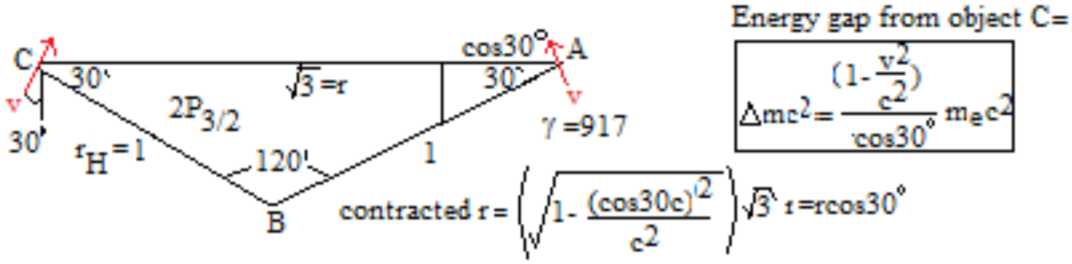
Object C adds it own spin (eg., as in 2nd derivative eq.A1) to the electron spin (1,IV quadrants) and the W associated with the $2P_{3/2}$ state at $r=r_H$ thereby adds a derivative in a neutrino quadrant (fig.4) thereby including neutrinos in thec Fermi 4pt. So 2nd derivative

$$\Sigma((\gamma^\mu\sqrt{\kappa_{\mu\mu}}dx_\mu)-i\kappa)(\gamma^\nu\sqrt{\kappa_{\nu\nu}}dx_\nu+i\kappa)\chi=\Sigma((\gamma^\mu\sqrt{\kappa_{\mu\mu}}dx_\mu)-i\kappa)\psi \text{ so } \tfrac{1}{2}(1\pm\gamma^5)\psi=\chi.\quad\text{(A9)}$$

In that regard the expectation value of γ^5 is speed and varies with $e^{i3\phi/2}$ in the trifolium. The spin½ decay proton $S_{½}\propto e^{i\phi/2}\equiv\psi_1$, the original ortho $2P_{1/2}$ particle is chiral $\chi=\psi_2\equiv½(1-\gamma^5)\psi=½(1-\gamma^5e^{i3\phi/2})\psi$. Initial $2P_{1/2}$ electron ψ is constant. Start with initial ortho state χ. These γ^5 terms then modify equation A8 to read $=\iiint_0^{V_{rH}}\psi_1\psi_2(2m_ec^2)dV_{rH}=\iint\psi_{S1/2}{}^*(2m_ec^2V_{rH}))\chi dV_\phi=$ $K\int\langle e^{i\frac{i\phi}{2}}\left[\Delta\varepsilon V_{r_H}\right]\left(1-\gamma^5e^{i\phi\frac{3}{2}}\right)\psi\rangle\,d\phi=KG_F\int\langle e^{i\phi/2}-\gamma^5ie^{i(4/2)\phi}\rangle d\phi=KG_F\left(\frac{2e^{i\phi}}{i}\Big|_0^{2\pi+C}-\frac{2\gamma^5e^{i4\phi}}{i4}\Big|_0^{2\pi+C}\right)$ = k1(1/4+iγ^5)= k(.225+i$\gamma^5$0.974) =k(cos13°+iγ^5sin13°) **deriving the 13° Cabbibo angle**. With previously mentioned CP result(direct evidence of fractal universe) get CKM matrix

C7 Object C Effect on Inertial Frame Dragging and G_F found by using eq.C8 again (N=1 ambient cosmological metric)

Review of $2P_{3/2}$ Next higher fractal scale ($X10^{40}$), cosmological scale. Recall from B9 m_ec^2 =Δε is the energy gap for object B vibrational stable iegenstates of composite 3e (vibrational perturbation r is the only variable in Frobenius solution, partII Ch.8,9,10) proton. Observor in objectA. Δm_ec^2 gap=object C scissors eigenstates. is what we see at object A but Δm_ec^2 gets boosted by γ by rotation into the object B direction.(to compare with the object B m_ec^2 gap).



From fig 7 $r^2=1^2+1^2+2(1)(1)\cos120°=3$, so $r=\sqrt{3}$. Recall for the positron motion $\gamma=\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}=917$.

So start with the distances we observe which are the Fitzgerald contracted AC=

$r_{CA}=1\sqrt{1-\frac{\cos^2 30°c^2}{c^2}}\sqrt{3}$ =.866=cos30°=CA and Fitzgerald contracted AB= $r_{BA}=x/\gamma=1/\gamma$ so for Fitzgerald contracted x=1 for AB (fig7). We can start at t=0 with the usual Lorentz transformation for the time component.

$$t'=\gamma(ct-\beta x)=kmc^2.$$

since time components are Lorentz contracted proportionally also to mc^2, both with the γ multiplication.

In the object A frame of reference we see Δm_ec^2 which is the average of left and right object C motion effect. We go into the AB frame of reference to compare the object B m_ec^2 with this Δm_ec^2. Going into the AB frame automatically boosts $\Delta m_{ec}{}^2$ to $\gamma\Delta m_ec^2$. So start from a already Fitzgerald contracted x/γ. Next do the time contraction γ to that frame:

$$t''=k\gamma\Delta m_ec^2=\gamma\beta r_{AB}=\gamma\beta\left(\frac{x}{\gamma}\right)=\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}\beta\left(\sqrt{1-\frac{v^2}{c^2}}\sqrt{1}\right)=\beta$$

with k defining the projection of tiny Δm_ec^2 "time" CA onto BA= cosθ=projection of BA onto CA. But m_ec^2 is the result of object B of both of the motion and inertial frame dragging reduction (D9) so its γ is large. To make a comparison of ΔE to AB mass m_ec^2 CA is rotated and translated to the high speed AB diection and distance with its large γ so thereby *object C becomes mathematically object B* with the same k because of these projection properties of: CA onto BA. So we define projection k from projection of m_ec^2: So again

$$t'=\gamma(ct-\beta x)=kmc^2=t'=km_ec^2=\gamma\beta r_{CA}=\left(\frac{1}{\sqrt{1-\frac{v^2}{c^2}}}\right)\beta\left(\sqrt{1-\frac{\cos^2 30°c^2}{c^2}}\sqrt{3}\right)=\gamma\beta\cos 30°$$

Take the ratio of $\frac{k\gamma\Delta m_ec^2}{km_ec^2}$ to eliminate k: thus

$$\frac{k\gamma\Delta m_ec^2}{km_ec^2}=\frac{\gamma\beta\left(\frac{x}{\gamma}\right)}{\gamma\beta r_{CA}}=\frac{1\beta 1}{\gamma\beta\cos 30°}=\frac{1}{\gamma\cos 30°}$$ so

$$\Delta m_ec^2=\frac{\beta m_ec^2}{\beta\cos 30°°\gamma^2}=\frac{\left(1-\frac{v^2}{c^2}\right)m_ec^2}{\cos 30°}\qquad\text{(A10)}$$

allowing us to finally compare the energy gap caused by object C (Δm_ec^2) to the energy gap caused by object B (m_ec^2. C8). So to summarize $\Delta E=(m_ec^2/((\cos30°)917^2)=m_ec^2/728000$. So the energy gap caused by object C is $\Delta E=(m_ec^2/((\cos30°)917^2)=m_ec^2/728000$. The weak interaction thereby provides the ΔE perturbation ($\int\psi^*\Delta E\psi dV$) inside of r_H creating those Frobenius series (partII) r≠0 states, for example in the unstable equilibrium $2P_{1/2}$ electrons m_e. so in the context of those e,ν rotations giving W and Z_o.. The G can be written for E&M decay as

$(2mc^2)XVr_H= 2mc^2 [(4/3)\pi r_H^3]$. But because this added object C rotational motion is eq.A9 Fermi 4 point it is entirely different than a mere 'weak' E&M. So for weak decay from equation A8 it is $G_F= (2m_ec^2/728{,}000)Vr_H=$**$G_F$** $=1.4X10^{-62}$ J-m^3 $=.9X10^{-4}$ MeV-F^3 **the strength of the Fermi 4pt weak interaction constant** which is the coupling constant for the Fermi 4 point weak interaction integral. Note $2m_ec^2/729{,}000=1.19X10^{-19}$J. So $\Delta E=1.19X10^{-19}/1.6X10^{-19}=.7$eV which is our ΔE gap for the weak interaction inside the Fermi 4pt. integral for G_F. This ΔE generates that r perturbation (instability) states in the Frobenius solution (partII) and so weak decay.
interaction integral. Note $2m_ec^2/729{,}000=1.19X10^{-19}$J. So $\Delta E=1.19X10^{-19}/1.6X10^{-19}=.7$eV which is our ΔE gap for the weak interaction inside the Fermi 4pt. integral for G_F.
The pertruubation r in the Frobenius solution is caused by this ΔE in $(\int\psi^*\Delta E\psi dV)$ with available phase space for $\psi^*=\psi_p\psi_e\psi_\nu$. and $\psi=\psi_N$.
The neutrino mass increases with nonistopic homogenous space-time (sect.3.1 and our direction of motion here) whereas that Kerr metric $(a/r)^2$ term (B9) in general is isoitropic and homogenous and so only effects the electron mass.

C8 NONhomogeneous and NONisotropic Space-Time

Recall 2D N=1 and that 2D N=0 (perturbation) orientations are not correlatable so we have 2D+2D=4D degrees of freedom. But this is all still embedded in the same complex (2D) plane. So this theory is still geometricall complex 2D Z then. Recall the $\kappa_{\mu\nu}$, $=g_{\mu\nu}$ metrics (and so R_{ij} and R) were generated in section 1.
In that regard for 2D for a homogenous and isotropic g_{ij} we have identically $R_{\mu\mu}-\frac{1}{2}g_{\mu\mu}R= 0$ (3.1.1) ≡source $=G_{oo}$ since in 2D $R_{\mu\mu}=\frac{1}{2}g_{\mu\mu}R$ identically (Weinberg, pp.394) with $\mu=0, 1$... Note the 0 (=E_{total} the energy density source) and we have thereby proven the existence of a net zero energy density vacuum. Thus our 2D **theory implies the vacuum is really a vacuum!** It is then the result of the fractal and 2D nature of space time!
A ultrarelativistic electron is essentially a transverse wave 2D object (eg., the $2P_{1/2}$ electron in the neutron). In a isotropic homogenous space time $G_{oo}=0$. Also from sect.2 eqs. 7 and 8 (9) occupy the same complex 2D plane. So eqs. 7+8 is $G_{oo}=E_e+\sigma\bullet p_r=0$ so $E_e=-\sigma\bullet p_r$
So given the negative sign in the above relation the **neutrino chirality is left handed.**
But if the space time is not isotropic and homogenous then G_{oo} is not zero and the **neutrino gains mass.**

C9 Derivation of the Standard Electroweak Model from Newpde but with No Free parameters

Since we have now derived M_W, M_Z and their associated Proca equations, and Dirac equations for m_τ,m_μ,m_e etc., and G,G_F,ke^2 Maxwell's equations, etc. we can now write down the usual Lagrangian densities that implies these results. In the formulation $M_Z=M_W/\cos\theta_W$ you can find the Weinberg angle θ_W, $g\sin\theta_W=e$, $g'\cos\theta_W=e$; solve for g and g', etc., We will have thereby derived the standard model from first principles (i.e.,postulate0). **It no longer contains free parameters.**
Note C_M=Figenbaum pt really is the U(1) charge and equation 16 rotation is on the complex plane so it really implies SU(2) (C1) with the sect.1.2 2D eqs. 7+8 = $G_{oo}=E_e+\sigma\bullet p_r=0$ gets the left handedness. Recall the genius of the SM is getting all those properties (of χ,,Z_o,W^+,W^-) from $SU(2)XU(1)_L$ so we really have completely derived the electoweak standard model from eq.16 which comes out of the Newpde given we even found the magnitude of its itnput parameters (eg., G_F (appendix C7), Cabbibo angle C6).

Appendix D **Counting actual quanta numbers N (instead of just n energy level 2nd quantization states |n>)**

D1 Recal from equation 11 $\left[\left(\frac{dr+dt}{ds}\right)\right]\delta z=\frac{ds}{ds}\delta z=(1)\delta z$ In that "implied iteration of the first application $\left[\left(\frac{dr+dt}{ds}\right)+\left(\frac{dr+dt}{ds}\right)\right]\delta z=2\frac{ds}{ds}\delta z=2(1)\delta z$ For all the rotations in fig.4 (except the eq.11 IVth to Ist quadrants: in eq.6.1 each quadrant rotation provides one derivative for each *v*)$\left[\left(\frac{dr+dt}{ds}\right)+\left(\frac{dr+dt}{ds}\right)\right]\delta z=2\frac{ds}{ds}\delta z=2(1)\delta z$. Equation 11 (sect.1) then counts units N of each 2 half integer S=½ angular momentums=1 unit oelectrons (spin1 for W and Z) off the light cone. For the rotation in the eq.11 IVth to Ist quadrants (each quadrant rotation provides one derivative for each *v*) at 45° dr=dt (on the light cone in fig.4) so for Hamiltonian H: 2Hδz=2(dt/ds)δz =2(½)δz= (1)ħωδz=ħckδz on the diagonal so that E=p_t=ħω for the two *v* energy components, universally. Thus we can state the most beautiful result in physics that E=Nhf for the energy of light with N equal N monochromatic photons. Thus this eq.11c counting N does not require the (well known) quantization of the E&M field with SHM (sect.6.10 below). Which seemed to me at least a adhoc process on the face of it since the Maxwell equations have nothing to do with SHM.

Given this comes from equation 11, these numbers are thereby "observables". We have come full circle, getting eq.11 'observables' and using equation 11 to define our inputs into the '1 'in 1=1+0,1=1X1,0=0X0 as an observable (Newpde electrons) , thereby starting our entire derivation all over again..

All defined numbers, and resulting symbols and rules, that are larger than 1 (N>1) we define as "applications" given our ultimate Occam's Razor attribute of the postulate of 0. Note applications can be arbitrearily complicated.

D2 Postulate 0 also implies the underlying 1,0 rela#math and n>1 "applications"

Review But we need to define the algebra first and use it to write the postulate. So define 1)*numbers* 1≡1+0 and **0≡**0X0,1≡1X1 as *symbol* **z=zz**: the *simplest* algebraic definition of **0**. So **2)Postulate** *real* number **0** *if* **z'=0** and **z'=1** plugged into z'=z'z'+C (**eq.1**) results in *some* C=0 constant(ie δC=0).

This is our *entire* Ultimate Occam's Razor **postulate(0)** ***theory***

Application: (i.e.,*plug* **z= 1,0** into eq.1 as required by above theory.)

Plug in **z=0**=z_o=z'in **eq1.** The equality sign in eq,1 demands we substitute z' on left (**eq1**) into right z'z' repeatedly and get iteration $z_{N+1}=z_Nz_N-C$. Note the *numbers* z_N possibly are larger than 1 so the larger 1+1≡2, 1+2≡3, etc (*defined* to be a+b=c) and define rules of algebra on these *numbers* like a+b=b+a (eg.,ring-field) with no new axioms. So postulate 0 also *generates* the big *numbers* and thereby the algebra we can now use:

If we state different rules than the standard ring-field algebra rules we still get the same physics but using these different marh rules in the physics laws.

Postulate 1 also gets us set theory. For example 1∪C≡1+C (If A∩B=∅). with algebraic definition of 1 z=zz having both 1,0 as solutions so defining negation ~with 0=1-1 Thus we can define interesectioon∩ with ~((A∪B)~B~A)≡A∩B. So we have defined both union ∪ and intersection ∩ so we have derived set theory.

So in postulate 1 z=zz why did 0 come along for the ride? The deeper reason in set theory is that ∅ is an element of every set just as 1≡1+0≡1∪rel0 **.** Note ∅ and 0 aren't really new postulates since they postulate literaly "nothing".So we just derived set theory from the postulate of 1.

Relationship between 0 and ∅

The null set ∅ is the subset of every set. In the more fundamental set theory formulation.∅ is not a real number so ∅ and 0 are not the same.But {some of the properties overlap such as ∅}⊂{all sets}⇔{0}⊂{1} since ∅=∅∪∅⇔0+0=0, {{1}∪ ∅}={1}⇔1+0=1.

So l**ist** 1∪1≡1+1≡2, 2∪1≡1+2≡3,..all the way up to 10^{82} (as an "application" so we haven't violated Ocam's razor. See Fiegenbaum point) and **define** all this list as a+b=c, etc., to create our algebra and numbers (rings^fields) which we use to write equation 1 z=zz+C, δC=0 for example.

D2 Alternative ways of adding 2D+2D→4D

Recall from section 1 that adding the N=0 fractal scale 2D δz perturbation to N=1 eq.7 2D gives curved space 4D. So $(dx_1+idx_2)+(dx_3+idx_4) \equiv dr+idt$ given (eqs5,7a) $dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ *if* $dr^2 \equiv dx^2+dy^2+dz^2$ (3D orthogonality) so that $\gamma^r dr \equiv \gamma^x dx+\gamma^y dy+\gamma^z dz$, $\gamma^j\gamma^i+\gamma^j\gamma^i=0$, i≠j,$(\gamma^i)^2=1$, rewritten (with curved space $\kappa_{\mu\nu}$ eq.14-17)

$(\gamma^x \sqrt{\kappa_{xx}}dx+\gamma^y \sqrt{\kappa_{yy}}dy+\gamma^z \sqrt{\kappa_{zz}}dz+\gamma^t \sqrt{\kappa_{tt}}idt)^2=\kappa_{xx}dx^2+\kappa_{yy}dy^2+\kappa_{zz}dz^2-\kappa_{tt}dt^2= ds^2$.

But there are alternaives to this 3D orthogonalization method. For example satisfying this 4D Clifford algebra and complex orthogonalization requirement is a special case of any 2 x_ix_j in eq.3 (directly from postulate1): Imposing orthogonality thereby creates 6 pairs of eqs.3&5. So each particle carries around it's own dr+idt complex coordinates with them on their world lines. Alternatively this 2D dr+idt is a 'hologram' 'illuminated' by a modulated $dr^2+dt^2=ds^2$ 'circle' wave (as 2nd derivative wave equation operators from eq.11 circle) since 4Degrees of freedom are imbedded on a 2D (dr,dt) surface here, with observed coherent superposition output as eq.16 solutions. A more direct way is to simply write the 4Degrees of freedom on the 2D surface as $dr+idt= (dr_1+idt_1)+(dr_2+idt_2) =(dr_1,\omega dt_2),(dr_2,idt_2)= (x,z,y,idt)=(x,y,z,idt)$, where ωdt≡dz is the z direction spin½ component ω (angular velocity) axial vector of the Newpde lepton (eqs.7-9); which we get anyway from lepton equation Newpde.

N=-1 and dimensionality

Note the N=-1 (GR) is yet another δz perturbation of N=0 δz' perturbation of N=1 observer thereby adding at least 1 independent parameter dimension to our $dx_1+(dx_2+idx_3)+ (dx_4+idx_5)$ (4+1) explaining why Kaluza Klein 5D $R_{ij}=0$ works so well: so GR is really 5D if E&M (N=0) included. Note these N=-1 fractal scale wound up balls at $r_H=10^{-58}$m are a lot smaller than the Planck length. But if only N=1 observer and N=-1 are used (no N=0) we still have the usual 4D GR Einstein equations. Recall the dx_1 (N=-1) is gravity.

Δ Modification of Usual Elementary Calculus ε,δ 'tiny' definition of the limit.

Recall that: given a number ε>0 there exists a number δ>0 such that for all x in S satisfying

$$|x-x_o| < \delta$$

we have

$$|f(x)-L|<\varepsilon$$

Then write $\lim_{x\to x_o} f(x) = L$

Thus you can take a smaller and smaller ε here, so then f(x) gets closer and closer to L even if x never really reaches x_o."Tiny" for h →L_1 and f(x+h)-f(x)→L_2 then means that L=0 =L_1 and L_2 . 'Tiny' is this difference limit.

Hausdorf (Fractal) s dimensional measure using ε, δ

Diameter of U is defined as $|U| = sup\{|x-y|: x,y \in U\}$. E⊂$\cup_i U_i$ and $0<|U_i|\leq\delta$

$$H_\delta^s(E) = inf \sum_{i=1}^{\infty} |U_i|^s$$

analogous to the elementary $V=U^s$ where of s=3, U=L then V is the volume of a cube Volume=L^3. Here however 's' may be noninteger (eg.,fractional). The volume here would be the respective Hausdorf outer measure.

The infimum is over all countable δ covers{U_i} of E.

To get the Hausdorf outer measure of E we let δ→0 $H^s(E) = \lim_{\delta\to 0} H_\delta^s(E)$

The restriction of H^s to the σ field of H^s measurable sets is called a Hausdorf s-dimensional measure. Dim E is called the Hausdorf dimension such that

$H^s(E) = \infty$ if 0≤s<dimE, $H^s(E)=0$ if dim E<s<∞

So if s implies a zero H or infinite H it is not the correct dimension. This rule is analogous to the definition of the (fractal) Mandelbrot set itself in which a C that gave infinity is rejected by the definition δC=0 we can model as a binary pulse (z=zz solution is binary z=1,0) with **zz=z (1) is the algebraic definition of 1 and can add real constant C** (so z'=z'z'-C, δC=0 (2)), z∈{z'}

Plug z'=1+δz into eq.2 and get δz+δzδz=C (3)

so $\delta z = (-1 \pm \sqrt{1+4C})/2$=dr+idt (4)

for C<-¼ so real line r=C is immersed in the complex plane.

z=z_o=**0** To find C itself substitute z' on left (eq.2) into right z'z' repeatedly & get $z_{N+1}=z_N z_N$-C. δC=0 requires us to reject the Cs for which

-δC=δ(z_{N+1}-$z_N z_N$)= δ(∞-∞)≠0**. z=zz** solution is **1,0** so initial

gets the **Mandelbrot set** C_M (fig2) out to some ||Δ|| distance from C=0. Δ found from ∂C/∂t=0, δC≡δC_r=(∂C_M/∂(drdt))dr =0 extreme giving the Fiegenbaum point ||C_M|| = ||-1.400115..|| global max given this ||C_M|| is biggest of all.

If s is not an integer then the dimensionality it is has a fractal dimension.

But because the Fiegenbaum point Δ uncertainty limit is the r_H horizon, which is impenetrable (sect.2.5, partI), ε,δ are not dr/ds eq.11a observables for 0<ε,δ<r_H. Instead ε,δ >Δ =r_H =the next 10^{40}X smaller fractal scale Mandelbrot set at the Fiegenbaum point.

Review Recall from eq.7 that dr+dt=ds. So combining in quadrature eqs 7&11 SNRδz=(dr/ds+dt/ds)δz =((dr+dt)/ds)δz=(1)δz (11c,append) and so having come *full circle* back to postulate 1 as a real eigenvalue (1≡Newpde electron). For all the rotations in fig.4 (except the eq.11 IVth to Ist quadrants: in eq.B1 each quadrant rotation provides one derivative for each *v* *v*)$\left[\left(\frac{dr+dt}{ds}\right)+\left(\frac{dr+dt}{ds}\right)\right]\delta z = 2\frac{ds}{ds}\delta z$ = 2(1)δz Equation 11 (sect.1) then counts units N of each 2 half integer S=½ angular momentums=1 =2 units of electrons (spin1 for W and Z) off the light cone. For the rotation in the eq.11 IVth to Ist quadrants (each quadrant rotation provides one derivative for each *v*) at 45° dr=dt (on the light cone in fig.4) so for Hamiltonian H: 2Hδz=2(dt/ds)δz =2(½)δz= (1)ħωδz=ħckδz on the diagonal so that E=p_t=ħω for the two *v* energy components, universally. Thus we can state the most beautiful result in physics that E=Nhf for the energy of light with N equal N monochromatic photons. Replaces 2nd quantization of 2 given allowed Newpde 10^{82} electrons(appendix A2) So we really do have a binary physics signal. So, having come *full circle* then: (**postulate 0⇔ Newpde**)

Digital communication anology: Binary (z=zz) 1,0 signal with white noise δC=0 in z'+C=z'z'. Recall the algebraic definition of 1 is z=zz which has solutions 1,0.(11c). Boolean algebra. Also you could say white noise C has a variation of zero (δC=0) making it easy to filter out (eg., with a Fourier cutoff filter). So you could easily make the simple digital communication analogy of this being a binary (z=zz) 1,0 signal with white noise δC=0 in z'+C=z'z'. (However the noise is added a little differently here (z+C=zz) than in statistical mechanics signal theory (eg.,There you might use deconvolved signal=convolution integral [(transfer function)signal]dA)). where the' signal' actually would equal z+C, not the usual $(2J_1(r)/r)^2$ psf So this is not quite the same math as in signal theory statistics statistical mechanics.)

The Whole Shebang:

This theory is 0

Postulate real number 0 if **z'=0** and **z'=1** plugged into z'=z'z'+C (**eq.1**) results in some C=0 constant(ie δC=0)

Plug 0 into **eq.1** and get the Mandelbrot set
Plug 1 into **eq.1** and get the Dirac eq.

Dirac plus Mandelbrot gets the Newpde

So Ultimate Occam's razor postulate(0) implies ultimate math-physics

So this theory is 0. Hold that thought.