Cauchy completeness and physics

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Abstract All mathematicians know that the real numbers (ie .rationals & irrationals) can be constructed from Cauchy completeness i.e. real# sets as rational Cauchy sequence limits. So all we did here is show we postulated real#0 by using it to derive a associated rational Cauchy sequence. We did this because that same postulate (of real#0) math *also* implies fundamental theoretical physics (eg.,the Newpde in 'results')

List 1≡1+0 and (*list*) **0**≡0X0,1≡1X1 *defined* as **z=zz**: the simplest algebraic definition of **0** and 1. So

Postulate *real* number **0** (so real1) *if* **z'=0** and **z'=1** is substituted (plugged) into z'=z'z'+C **eq1** results in *some* C=0 constant(ie δC=0). Thus

•Plug in **z=0**=z_o=z'in **eq1.**To find ***all* C** substitute z' on left (**eq1**)into right z'z' repeatedly andget iteration $z_{N+1}=z_Nz_N$-C. Constraint **δC=0** requires we reject the Cs for which -δC=δ(z_{N+1}-z_Nz_N) =δ(∞-∞)≠0. The Cs that are left over define the **Mandelbrot set** C_M=C with asubset C=0,fractal scales δz'=10^{40N}δz,N=integer These fractal scales having their own δz then perturb that **z=1** so put z=**1**+δz in **eq.1** to get δz+δzδz=C (3) Define N≤0 as 'observable'fractal scales. Thus define the'observer'fractal scales as N≥1 implying |δz|>>1 Then solve equation 3 as a quadratic equation so δz=$(-1\pm\sqrt{1+4C})/2$=dr+idt if C≤ -¼ (complex) (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 the hypothesis of our above postulated *real#0* math and so also **real1** *since* **1**=1+0≡1∪real#0.

•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)] = δ[(dr^2-dt^2)+i(drdt+dtdr)]=0 (5)

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

Factor real eq.5 δ(dr^2-dt^2)=δ[(dr+dt)(dr-dt)] =0=[[δ(dr+dt)](dr-dt)]+[(dr+dt)[δ(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 and C_M just fall (pop) out of eq.1, amazing!

(These e,*v* quadrants merely *illustrate* the 4 Boson SM 4 rotation extreme of **N=0** perturbed eq.7,so eq.12)

•**Both z=0,z=1** together (in eq1. Use orthogonality to get (2D+2Dcurved space)). Thus (z=1)+(z=0)= (dx_1+idx_2)+(dx_3+idx_4)≡dr+idt given $dr^2-dt^2=(\gamma^r dr+i\gamma^t dt)^2$ *if* $dr^2≡dx^2+dy^2+dz^2$ (3D orthogonality) so that $\gamma^r dr≡\gamma^x dx+\gamma^y dy+\gamma^z dz$, $\gamma^j\gamma^i+\gamma^j\gamma^i=0$, i≠j,$(\gamma^i)^2=1$, rewritten (**N=-1** eq.12 implies the covariant κ_{ij} of eq.13,15) as $(\gamma^x\sqrt{\kappa_{xx}}dx+\gamma^y\sqrt{\kappa_{yy}}dy+\gamma^z\sqrt{\kappa_{zz}}dz+\gamma^t\sqrt{\kappa_{tt}}idt)^2=\kappa_{xx}dx^2+\kappa_{yy}dy^2+\kappa_{zz}dz^2-\kappa_{tt}dt^2=ds^2$. Multiply both sides by $1/ds^2$ and $\delta z^2≡\psi^2$ use circle $-i\partial\delta z/\partial r=(dr/ds)\delta z$ inside brackets( ) get 4D QM $\gamma^\mu(\sqrt{\kappa_{\mu\mu}})\partial\psi/\partial x_\mu=(\omega/c)\psi$≡Newpde for e,*v*, $\kappa_{oo}=1-r_H/r=1/\kappa_{rr}$, $r_H=e^2X10^{40N}/m$ (**N**=. -1,0,1.,). So **Postulate** 1→**Newpde**

Results: of (merely plugging z'=0,z'=1 into eq.1) **postulate1**: (1) backups: davidmaker.com

Newpde: **N**=0,stable r=r_H composite(part II) 3e $2P_{3/2}$ is baryons(QCD not required), SM is the extreme of 4 e,v quadrant rotations. **N**=-1 is GR. Expansion stage of **N**=1 scale δz'=δze^{iwt} Dirac eq zitterbewegung oscillation is the cosmological expansion, **N**=0 the 3^{rd} order Taylor expansion component(1) of $\sqrt{\kappa_{rr}}$ gets the anomalous gyromagnetic ratio so don't need the renormalization infinities. So we get the physics here

Math: We use that **1**+c≡1∪c to define above *list-define* (ring-field) algebra and note again that iteration gives a Cauchy sequence limit of real# eigenvalues, so we get the rel# math as well 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* 1 implies all *fundamental math-physics.* no more, no less(eg simply 4D)

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

Reminder: *Real#0* math postulaties literally nothing(0) (except **real1** *since* **1**=1+0≡1∪real#0.) The algebraic *definition of 1* (*and* 0) is z=zz (note z= **0,1**) *if* C=0 in the below definition: so there must be a small C limit *at the end* since here C is defined to be constant *only* at C=0.This small C limit $C=C_M/\gamma=C_M/mass\equiv r_H$ frame of reference (γ from eq.5) makes us define both mass and charge $C_M=e^2$.

Summary: This

Theory is 1 The rest is a (rel#1) definition.

Theory Real#1 **definition**

Postulate 1 is defined algebraically if **z=1** and **z=0** (plugged) into z=zz+C eq1 gives *some* C=0 constant(ie δC=0) So

plug (δC=0 &) **z=0** into **eq1** iteration(to get ***all*** C) get 2D(complex) **Mandelbrot** set C_M=C (fractal scale N)

(This iteration also results in a rational Cauchy sequence confirming 0,1 is a real# comes from above 0,'1' definition)

plug (δC=0 &) **z=1** into **eq1** get 2D **Dirac** equation ((N=1)≡'observer' perturbing N=0 "observables")

combine **both** 2D+2D=4D **Newpde** using $(dx_1+idx_2)_{z=0}+(dx3+idx_4)_{z=1}$=dr+idt & dr 3D orthogonalization

therefore

postulate 1→ Newpde (So we get all of physics and *list-define* algebra and Real#math(1 such C_M iteration is rational Cauchy) **everything** that is physical, no more, no less. See backups at davidmaker.com eg.,in 'introduction'' Ultimate Occam's razor postulate1so ultimate physics theory, we completely understand the universe.