The "Big Bang"

(in progress)

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The Relativistic Unit Circle

Proof of Fermat's Last Theorem

Proof of Goldbach's Conjecture (includes link to Thoughts below, which adds final touches)

Thoughts on Goldbach's conjecture (and other topics).

Relativity and Spin

Consider the equation used to characterize the Relativistic Unit Circle, together with "Spin" in "Cartesian coordinates":

$$\varphi = c\tau' = c\tau + v\tau'$$
$$\varphi^2 = (c\tau')^2 = (c\tau + v\tau')^2 = (c\tau)^2 + (v\tau')^2 + 2(c\tau)(v\tau')$$
$$S = 2(c\tau)(v\tau')$$
$$S^2 = 2h^2,\ h^2 = (c\tau)(v\tau'),\ S = \frac{h}{\sqrt{2}}$$

This equation characterizes change in terms of a single initial state $(c\tau)$, a final state $(c\tau')$ and a perturbation $(v\tau')$, where the interaction (radiation, absorption) between the initial state and the perturbation is characterized by the "Spin" S where $\gamma = \frac{\tau'}{\tau} > 1$ characterizes absorption in terms of hyperbolic functions, and $\frac{1}{\gamma} = \frac{\tau'}{\tau} < 1$ in terms of trigonometric functions. Note that $v = 0$ for $\tau' = \tau$

(Either at the initial state (nothing has happened), or the final state

Note that in radial coordinates,

$$r'' = r + r'$$
$$\left(r''\right)^2 = \left(r + r'\right)^2 = r^2 + r'^2 + 2rr'$$
$$\pi\left(r''\right)^2 = \pi\left(r + r'\right)^2 = \pi r^2 + \pi r'^2 + r\left(2\pi r'\right)$$

So that "Spin" is characterized as an interaction between the radius of one circle and the circumference of another.

Note that if the restriction to positive definite quantities can be relaxed (corresponding to moving the zero point energy from the edge of the RUC to its center), the equation then becomes:

$\pi\left(r''\right)^2 = \pi\left(r \pm r'\right)^2 = \pi\left(r' \pm r\right)^2 = \left(\pi r\right)^2 + \left(\pi r'\right)^2 \pm r\left(2\pi r'\right)$ where the spin term is now positive or negative, corresponding the positive and negative "charge" (this corresponds to rotation of the γ "radius" in absorption or the increase or decrease of the "rest mass" $\frac{1}{\gamma}$ in radiation when $v \neq 0$.

Special Relativity

And complex conjugation, which eliminates the interaction term S

$$\psi = c\tau + iv\tau'$$
$$\psi\psi^* = \left(c\tau + iv\tau'\right)\left(c\tau - iv\tau'\right) = \left(c\tau\right)^2 + \left(v\tau'\right)^2$$

If $\psi\psi^*$ is then equated to $\varphi = c\tau'$, the squared result is

$$\left(\varphi\right)^2 = \left(c\tau'\right)^2 = \left(c\tau\right)^2 + \left(v\tau'\right)^2$$

Solving this equation for τ' yields

$\tau' = \tau\left[\frac{1}{\sqrt{1-\beta^2}}\right], \ \beta = \frac{v}{c}$, where the "Lorentz factor" is defined as $\gamma_L \triangleq \left[\frac{1}{\sqrt{1-\beta^2}}\right]$:

Generalized Analysis (The "Big Bang")

Note that the "metric" term $"x" = v\tau$ is absent from the initial expression; for mass $"x" = m_{v\tau} = v\tau$, this indicates the "creation" of the perturbation field at the same "time" as that of $m_{c\tau} = m_0 = c\tau_0$ and thus a second particle. For mass, the interpretation is that v is a mass creation rate, and $\tau = \tau'$ is a mass creation "time" resulting in $m_{v\tau} = v\tau$ so that the perturbation is created at the same time as the "rest mass". This is sometimes called the "**big bang**" starting from $\tau = \tau' = 0$

(The actual "Big Bang" is the event that occurred just before the gleam in your father's eye faded.)

If this expression is included in terms of the final state, there are several possibilities (note that there are three terms on the right hand side, corresponding to three "dimensions" if none of them interact:

$$
\begin{aligned}
&(c\tau') = (c\tau) + (v\tau) + (v\tau') \\
&(c\tau')^2 = (c\tau)^2 + (v\tau)^2 + (v\tau')^2 \\
&(c\tau')^3 = (c\tau)^3 + (v\tau)^3 + (v\tau')^3
\end{aligned}
$$

For all quantities existing (positive definite)

$$
\begin{aligned}
&(c\tau') = (c\tau) + (v\tau') + (v\tau) \\
&(c\tau')^2 = \left[(c\tau) + (v\tau') + (v\tau)\right]^2 = (c\tau)^2 + (v\tau')^2 + (v\tau)^2 + \operatorname{Re} m(c\tau, v\tau.v\tau', 2)
\end{aligned}
$$

And

$$
(c\tau')^n = \left[(c\tau) + (v\tau') + (v\tau)\right]^n = (c\tau)^n + (v\tau)^n + (v\tau')^n + \operatorname{Re} m(c\tau, v\tau.v\tau', n)
$$

If all elements interact (this can be extended to multiple elements by the Multinomial Expansion), in which case

$$
(c\tau')^n = (c\tau)^n + (v\tau)^n + (v\tau')^n \Leftrightarrow \operatorname{Re} m(c\tau, v\tau.v\tau', n) = 0 \ .
$$

It may be the case that some of the elements do not interact,

$$
\begin{aligned}
&(c\tau') = (c\tau + v\tau') + (v\tau) \\
&(c\tau')^2 = \left[(c\tau + v\tau') + (v\tau)\right]^2 = (c\tau + v\tau')^2 + (v\tau)^2 + 2(v\tau)(c\tau + v\tau') \\
&= (c\tau + v\tau')^2 + (v\tau)^2 + 2(v\tau)(c\tau) + 2(v\tau)(v\tau') = \\
&= (c\tau)^2 + (v\tau')^2 + 2(c\tau)(v\tau') + (v\tau)^2 + 2(v\tau)(c\tau) + 2(v\tau)(v\tau')
\end{aligned}
$$

where the term $(v\tau)^2 + 2(v\tau)(c\tau) + 2(v\tau)(v\tau')$ is due to the added creation term of the perturbation. Note that $(c\tau')^2 = (c\tau)^2 + (v\tau')^2 + 2(c\tau)(v\tau') \Leftrightarrow (v\tau) = 0$

This process can be extended to multiple instances particles) of v_i by induction.

Note that:

$$\psi = (c\tau') = (c\tau + v\tau') + (iv\tau)$$
$$\psi\psi^* = (c\tau')^2 = \left[(c\tau + v\tau') + (iv\tau)\right]\left[(c\tau + v\tau') - (iv\tau)\right] = (c\tau + v\tau')^2 + (v\tau)^2$$

Partitioning (Quarks, "Volumes")

$$(c\tau')^3 = \left[(c\tau) + (v\tau') + (v\tau)\right]^3 = (c\tau)^3 + (v\tau')^3 + (v\tau)^3 + \mathrm{Re}\,m\left[(c\tau),(v\tau'),(v\tau),3\right]$$

Note that

$$(c\tau')^3 = (c\tau)^3 + (v\tau')^3 + (v\tau)^3 \Leftrightarrow \mathrm{Re}\,m\left[(c\tau),(v\tau'),(v\tau),3\right] = 0$$

Here $\mathrm{Re}\,m\left[(c\tau),(v\tau'),(v\tau),3\right]$ is the analogue of "Spin" in three "dimensions" where positive and negative "charge" can be characterized by quaternions where $[ijk] = -1$ so that the interaction terms can characterized by Quark "charge", with the other particles (strange, etc.) characterized by sub partitioning (reflection, chirality, etc.) the various parameters for $v \neq 0$.

This process can be continued by induction for higher powers of n, and for multiple particles v_i.

The Derivative

$$(c\tau')^2 = \left[(c\tau)^2 + (v\tau)^2\right] + (v\tau')^2 + 2(c\tau)(v\tau') + 2(v\tau)(c\tau) + 2(v\tau)(v\tau')$$

For $(c\tau')^2$ the final state, the rate of change with respect to the second "particle" is

$$\frac{(c\tau')^2}{(v\tau)^2} = \left(\frac{c\tau'}{v\tau}\right)^2 = \left(\frac{\gamma}{\beta}\right)^2$$

If $c\tau'$ represents the mass of the final state of a photon as observed and $v\tau$ represents the mass of the galaxy in which it was created, then $v\tau \to \infty$ and $c\tau' \to 0$ relatively; the change in $v\tau$ will be infinitesimal and can be treated as a constant, so that $\left(\frac{\gamma}{\beta}\right)^2 \to \infty$ and $\left(\frac{\beta}{\gamma}\right)^2 \to 0$

Then in the RUC, $\theta \to \frac{\pi}{2}$ (in the first quadrant) and $(c\tau) \to 0$ (the "rest mass" of a photon vanishes relative to that of the photon-equivalent mass of the galaxy). At the limit, the system is then only represented by one prime number (in this case $|v\tau| = \left(\sqrt{v}\right)^2 \left(\sqrt{\tau}\right)^2 = \left(\sqrt{v\tau}\right)^2$)

Entropy

Consider

$$\left(c\tau'\right)^2 = (c\tau)^2 + \left(v\tau'\right)^2 + 2(c\tau)\left(v\tau'\right) + \left(v\tau\right)^2 + 2\left(v\tau\right)\left(c\tau\right) + 2\left(v\tau\right)(v\tau')$$

By "imagining" that $\left(c\tau'\right)^2 = \{0\}$, $v < 0$ and $\left(v\tau\right)^2 + 2\left(v\tau\right)\left(c\tau\right) + 2\left(v\tau\right)(v\tau') = 0$, (i.e. $v\tau = 0$) the expression in "three dimensions" becomes

$(c\tau)^2 + \left(v\tau'\right)^2 - 2(c\tau)\left(v\tau'\right) = \{0\}$, so that $(c\tau)^2 + \left(v\tau'\right)^2 = 2(c\tau)\left(v\tau'\right)$ which can be interpreted as areas of prime numbers (thus countable, but unobservable), consistent with Beckenstein-Einstein suggestion that entropy proportional to the area A for the case $n = 2$ (From Fermat and Goldbach), since the entropy $S = k_B \log \Omega$ is proportional to

$S = k_B A = k_B L = k_B\left[(c\tau)^2 + \left(v\tau'\right)^2\right] = k_B\left[2(c\tau)\left(v\tau'\right)\right]$ where red characterizes prime numbers under addition, and blue characterizes prime numbers under multiplication, and the following relations characterizes both sets.

$$\sqrt{c} = \sqrt{\tau},\ \sqrt{v} = \sqrt{\tau'}$$

$$(c\tau) = \sqrt{p_1} = \left(\sqrt{(c\tau)}\right)^2$$
$$(v\tau') = \sqrt{p_2} = \left(\sqrt{(v\tau')}\right)^2$$

So that

$$\begin{aligned}S &= k_B A = k_B L = k_B\left(\sqrt{L}\right)^2 = k_B\left[(\sqrt{p_1})^2 + (\sqrt{p_2})^2\right]\\ &= k_B\left[p_1 + p_2\right] = k_B\left[A_1 + A_2\right]\\ &= k_B\left[2(p_1)\left(p_2\right)\right] = 2A\end{aligned}$$

where

$$\begin{aligned}L &= \log\Omega = 2N\\ 1_L &= \log_L(L) = \log_{2N}(2N) = 1_{2N}\\ 2 &= \log_{\sqrt{N}}(\sqrt{N})^2 = \log_{\sqrt{N}}\left(N\right)\end{aligned}$$