Undecidability, Uncomputability, and Unpredictability

This essay contest is an “un” contest with respect to decidability, computability, and predictability. “un” is the negation of some action. “IMO”, the question concerns limits on what one can prove, compute, and predict. Let me take the opposite side of the “un” coin. Let me prove what is knowable, and then ask, “what can one compute and predict in some finite future time frame, or past frame?”

If one cannot prove what one says then it is an opinion. This much is true. But the stronger version of this states, “if one cannot prove it to be true, then it is most likely not.” If one tried to argue the opposite by stating “if one cannot prove it true, then it most likely is true, because one has suggested it to be so.” Which one of these philosophies would you bet on? I love Leonard Susskind; Leonard is the guy who said Stephen Hawking was wrong about information being lost. Susskind once said something equivalent to “If one has excluded all possibilities but one, the one remaining, no matter how improbable, must be true. Said another way “If I can prove every possibility to be false but one, then the last one remaining must be true.” This is truth by the exclusion rule. But there must be another exclusion rule that states “If I add another rule, aka a dimension, I increase the number of possibilities one must consider, creating a possibility that one has not considered. How does one know that all possibilities have been considered? I can always add (1) to some finite number without it becoming infinite. If I can present a possibility that one has not considered, then that consideration must be true, unless one can prove it false. If one cannot prove it false, then it must be true, by the “Susskind rule”.

This document was written in “HH” format, meaning “having humor”, “HaHa” just for fun!

Because I am from another planet some of my vocabulary does not match with the real meaning of the word I lose, or the computer chose to print. Sometime meaningful information is lost in transmission. Entropy is real, my friends. But because I am a mathematician from planet Zeon, all my math is correct, and we can be sure of that because the correctness of my math is what enabled me to be here at this correct moment in time, and the correct location in space. I can tell you this was not an easy feat. I was aiming for John

Preskill @ CIT the week of the covid-19 shut down, but some dude named Paul was in his office handing John a business card with the two greatest equations of all time. They completely define our “universe”,(U), in 2+1D. They were the very same equations I used to get here. At the time I made my calculations some 43 light years away, measuring those light cones at that distance was difficult. But I distinctly remembering at one point in Paul’s past light cone, his father stating, Paul will never live to be twenty. So, I may have lost some information when I assumed the chances of this guy being in John’s office at some point beyond his age of twenty in time would be zero. Heck the kid was so dumb he barely graduated high school. How could he ever write down the two most important equations in all of physics. The same ones I wanted to share with you humans at a point in time when you should be capable of comprehending them. If I had shown them to a cow, the cow would simply reply, “sir, can you please move, you are standing on my lunch!” John Preskill by my calculations was my best choice.

I traveled through space-time as a wave to get here, and all my information was conserved. The first person that I contacted absorbed all my information and is now writing this paper as I instruct him. I was really aiming for John because he would be better at explaining it. So now my information is entangled within this guy named Paul, because my calculation was off by such a small error in my future space-time calculation. But really he is still the same old Paul but with lower entropy. “Ok “, I admit, I increased his mass by just a smidgen, if you will, it really does not show in the mirror, but he has a warmer glow about him now. You see “information density”, (ρI), increases “thermal density”,(ρT). “Temperature”,(T), measures (ρT), and “Energy density”,(ρE). ”,(ρE) is “Entropy”,(S).

(S) = (E)/(T)

Going back in time our (U) had a smaller “radius”, (R•), but with a corresponding higher (T•). Let us now ask a question. How does the (T•) of the (U) change when measured on some holographic surface containing a constant mass, (M_u) as we decrease (R•^{2}), aka, with respect to the surface area. Let us ask another question. Can this 2-D surface (R•^{2}) even have a (T)? Yes. That surface has (S). If (M_u) is conserved then (E_u) is conserved, but the (T) is always changing. It makes sense when putting a fixed amount of (E) in some smaller radius,

(T) should increase while (E) is conserved. Thermal density and mass density will increase along with (T), and (ρI). The only thing decreasing is (t), volume, surface area and radius. What I want to know is, If I squeeze a (U) of some finite "mass", (M_u) inside a smaller horizon how does the (M•), (R•), and(T•) change.

In the History of earth no person has put all three variables into one equation for some finite (U), having a quantized finite mass measured at the Planck scale using the following correspondence between the space-time metrics for light and gravity, where the following correspondence must hold at all points in space-time.

Eq.#1 $\{(c^2)/(G) = (M_p)/(L_p)\} = (½)$

Any finite universe with observers can measure these values. At every point in spacetime one will measure the same value regardless of scale. The very first thing an intelligent observer should ask is, "where is the value for (T) in this relationship? Are we to measure this (U), using (M_p), (L_p), and Kelvins? Yes, this will work in our (U). The problem with (T) is that we need to increase the number of dimensions until space-time becomes quantized by the only quantum metric, having (1)DOF, and that metric is the Planck length. If we divide both sides of the equation by a (L_p), we will increase the number of dimensions from 1-D to 2-D. It will also increase to number of degrees of freedom to be measured by a huge factor.
It looks like this.

Eq.#2 $\{(c^2)/(GL_p) = (M_p)/(L_p^2)\} = 1$ (unitary)

This equation is written in 2-D

So, how many DOF did we add? There is only one answer to this question that is compliant with Noether's theorem, that will conserve (M_u), (E_u), and (I_u) with some symmetry measured in 2-D. What I am trying to say is; the thing that needs to be conserved going backwards in time as we reduce the radius, is the original surface area equal to (R_u^2). This is because (R_u^2) must conserve both (M_u) and (E_u). The only way to do this is to increase the surface density of the horizon, aka raise the (T). The maximum number of DOF when measuring a finite universe when measure in 1-D using the Schwarzschild metric quantized in (L_p) must be equal to (R_u/L_p) = (N). If (N) be the number of DOF with respect to (R•) then the increase in the number of DOF measured in 2-D = ($2N^2$). Why is there a factor of (2)? Because in 2-D we can measure 2 orthogonal properties with 2 orthogonal dimensions. If mass and energy are orthogonal we can make them entangled when measured with unitary scale. A unitary scale must have a max. density function = 1, when measured in 2-D @ the horizon. If our metric is now a (L_p^2) we can set its value to (1).

(L_p^2) = 1 If true

(L_p) = 1/(L_p),

When we go from Eq#1 to Eq#2 we can show the increase as being equal to the inverse of (R•).

Eq.#3 $\{(c^2)/(GL_p) = (M_p)/(L_p^2) = (T_i)/(T_u)\} = 1$ (unitary)

This equation is now written in 2+1D

If we choose to go back to 1-D we can multiply Eq.#3 again by a (L_p) and get the following.

$\{(c^2)/(G) = (M_p)/(L_p) = (L_p)(T_i)/(T_u)\}$

We have now restored Eq#2 but with an additional term $(L_p)(T_i)/(T_u)$. This value is equal to (R_u). Because $(R_u)/(L_p) = (T_i)/(T_u)$. This is provable.

What does this mean? If we want to conserve some area = (R_u^2) and that area must represent both (M_u) and (E_u) they must be orthogonal. Can I prove this, yes! Einstein said the happiest thought he ever had was realizing the equivalence principal between gravity and the acceleration of a frame of reference. The first time I ever heard of this, is the first time I thought about it. I remember saying "of course it's true, it's obvious." My greatest moment was realizing E = (Mc^2) = (½). Think about this. At the start of the (U) the (M_u) was thermalized to its max limit. We now see a (U) that may have 10^{12} galaxies all having 10^9 stars, that have been burning at an extremely high temperature for more than 10^8 years. Yet all these heat sources over the life of the universe cannot raise the (T) of the vacuum. In fact, the (T)keeps going down. Compare that to every time I light a match in my room the temperature goes up immediately. What this tells me is that (E) cannot thermalize itself. The only thing (E) can thermalize is (M). This means (M) and (E) are two different things that can be entangled when represented by a dual basis. A dual basis is when a 2-D object represent 2 orthogonal things that have a 1;1 correspondence, such as (M) and (E). If (M) and (E) are two different animals then I could conceive of holding each in my hands. All the (M_u) in my left and all the (E_u) in my right. They may or may not have the same volume, but they have the same weight. Einstein wrote the most famous equation to date.

$(E) = (Mc^2)$

But he should have written (E_u) = ($M_u c^2$), meaning the all the (M) and (E) in the universe is separate but equal. The total amount of stuff in the (U) = (E_u) + ($M_u c^2$) = 1. This translates to (E) = (Mc^2) = (½). This tells us if we only measure (M) in 1-D, we are only measuring (½) of the two things that must be conserved. Therefore, Schwarzschild's solution also has the fraction (½). The very first time I saw Carl's solution I said to myself, after seeing (½) in the equation, "where is the other (½)"? It's not unitary. There is no mention of temperature in Einstein's energy equation, and yet all energy must have a (T) expressible as (S). What does this really say? If we raise the (T) of any (M) from zero to (T_i) we will double the (M) because we added an equal amount of (E). This is true because every possible microstate of (M) must be able to contain one and only one quantum of energy. Stored energy is stored (I). Each quantum of (M), must store one quantum of (E) having the ability to raise the (T) from zero to (T_u). If that quantum of (M) was to radiate it's thermal (E) into the vacuum it's (M) would be cut in (½), and the (T) goes to zero. The number of possible microstates must have a 1:1 correspondence with the max possible thermal DOF. Therefore, at the start of the (U) when all the (M) was localized within the horizon, the (M_u) by virtue of its (T) had an equal amount of (E_u) because of symmetry. The effective (M_u) was ($2M_u$). This causes an obvious problem. As the (U) expands and cools the effective local mass responsible for the conservation of rotational momentum decreases causing an increase in local rotation in order to conserve momentum. There is no need for dark (M).

This equation lets me calculate both past light cones and future light cones measured in 2+1D.

$$\text{EQ4: } (M_\bullet)/(R_\bullet^2 T_\bullet) = (2\pi k)/(c^2 L_p^2) = (\tfrac{1}{2}M_p)/(L_p^2 T_i) = (M_u)/(R_u^2 T_u) = (\tfrac{1}{2})$$

One should stop reading at this point and consider how profound this equation really is. This equation is not only true for our universe, but valid for all BH's when measured with just three metrics for (M), (R), and (T). This equation is also true for all finite universes having observers that can measure the four constants in Eq.#2. What one can discern from this equation is that in all finite (U's) that have observers, the density function is determining the amount of (I). The relationship is clear, as the amount of information increases the value of (c^2) increases, while at the same time the value of (G) must decrease. If we set and hold constant then ($M_\bullet$) = (M_u). This will conserve (M_u). We can then see how the ($R_\bullet$) and ($T_\bullet$) change over time. The (U) starts in some finite dense state with the mass thermalized with an equal amount of (E_u). It says our (U) started like a soap bubble having a surface (T) = (T_i).

On that surface every (L_p^2) had a mass to area ratio = (M_p)/(L_p^2). We can even calculate the radius, (R_i) at (T_i). This soap bubble is the size of a speck of dust with radius = (0.0015)m. It is awfully close to the size of a human ovum. Imagine the (U) starting about the same size we all did. There are no singularities, and no inflation.

The quantizing metric in Eq.#4 is found in the denominator, ($c^2L_p^2$), how cool is that, this is a real energy term. We can even calculate the (S) and (T).

$(c^2L_p^2) = (4\pi k_bT_u)$ compared to a (M_p) we find

$(c^2M_p) = (4\pi k_bT_i)$

Why Hawking never tried to put (M), (R), and (T) in one equation is beyond me.

The two equations I claim to have proven to completely describe our universe in 2+1D.

EQ.#3 $\{(c^2)/(GL_p) = (M_p)/(L_p^2) = (T_i)/(T_u)\} = 1$ (unitary)

EQ4: $(M_\bullet)/(R_\bullet^2T_\bullet) = (2\pi k)/(c^2L_p^2) = (½M_p)/(L_p^2T_i) = (M_u)/(R_u^2T_u) = (½)$

I must stop now and apologize for a poorly written essay. It's is embarrassing for me to submit this. I ran out of time because I just learned of this contest. I have been working on one problem for 40 years. I can prove my equations are true beyond doubt. Heck, anyone with a degree should be able to prove it themselves. I cannot do it in the allotted space and time left. I literally have 90 minutes to edit this. If I can prove they are correct then our understanding of our universe must change. It has been obvious to me for many years that a belief in singularities, requires one to embrace inflation. These two equations prove that they cannot be properties inside space-time. This opportunity to have my essay reviewed by anyone is more that I could ever have hoped for. I have spent 40 years alone teaching myself by listening to others. Every Physicist I know has made a mistake. A BH can not evaporate in space-time and I would love the opportunity to prove this. My equation proves our universe is what I call an Asymmetric quantum oscillating computer. Mass stores information, energy processes information. I can prove the program must terminate in a rational way, and the program terminate, then enter a state of nonexistence, then reboot from the initial state without collapse. Truly an astonishing claim. Proof that mass, energy, and information is conserved not only guarantees our universe is comprehensible, it guarantees an unending repeating cycles of finite (U's) with each one having the same amount of conserved information. It guarantees our existence. I do not deserve an award for my writing. I hoped that any recognition of my equations would give me credibility within the physics community where everyone else has credentials that I do not possess. I literally have taught myself from within Plato's cave. At times I feel like I am from another planet. I have such severe learning disabilities. I barely graduated high school, but my love for mathematical truth is unusual. When I think of the obstacles people like Emmy Noether, or Stephen Hawking faced and overcame, I feel weak and lowly, but I will not stop doing what I am compelled to do. I do math every day. Without doubt this is the greatest opportunity I have ever had to express to a group of educated and interest people. I am incredibly grateful to the FQXi community for this opportunity. Thank you all. The truth in me honors and sees the truth in all of you. Namaste.

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