

PLANCKTECH

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Abstract

Plancktech is technology (computing and engineering) at the Planck scale, i.e. 10×10^{-35} meter, the scale of strings and (mem)branes in M-Theory. This essay gives some tentative ideas on how such a technology might be implemented. It uses (closed loop) graviton strings that can open and close on the surfaces of branes enabling them to be linked into a chain to form 1D, 2D and 3D Planck scale engineered structures.

X-Techs

One of my research interests is what I call “X-techs” i.e. trying to dream up ideas on how a technology

could be implemented at the “X scale”, where X could be femto, atto, zepto, yocto etc (i.e. at the $10^{\text{exp}-15}$ of a meter, $10^{\text{exp}-18}$ m, $10^{\text{exp}-21}$ m, $10^{\text{exp}-24}$ m, etc.) In earlier essays in the Humanity Plus magazine I dreamt up ways to compute at the femto and atto scales. In this essay I will concentrate on the engineering side, i.e. how to build things, and at the Planck scale, which is the smallest scale that mankind has even conceived of, namely $10^{\text{exp}-35}$ m, the scale of strings and (mem)branes in 11 dimensional M-Theory.

Plancktech

The basic idea I had to build structures at the Planck scale is so simple that I could explain it to a four year old. Take two thin strips of paper and glue the two ends of one strip together to form a loop. Then insert the second strip into the hole of the first loop and glue its two loose ends together to form a chain of two loops or links. If you can do this once, you can do it repeatedly, forming a 1D chain of many links, like the heavy metal anchor chain of a large ship. By linking

4 loops onto a single loop (N, E, S, W), one could start to form a 2D structure, rather like the chainmail armor of meshed interlinked metal rings, used to protect the medieval knights from enemy swords. By linking 6 loops onto a single loop (N, E, S, W, up, down), one could start to form a 3D structure, rather like the bricks in an Egyptian pyramid.

The next step was to find some physical entity that might correspond to a link at the Planck scale. I was watching an old NOVA video on “String Theory” hosted by Brian Greene, author of the book “The Elegant Universe” which gave me the idea. In the video, Greene stated that gravitons are closed (looped) strings, whereas other strings are open having their two ends attached to (mem)brane surfaces in 11 dimensional hyperspace, which is characteristic of M-Theory. Thus most strings are stuck on the brane, whereas gravitons can roam freely from the branes.

That gave me a way to create my linked Planck scale structures. This is how it might be done, explained in a step by step fashion.

Branes and Gravitons

Fig. 1 shows a brane and two free unattached gravitons (the two closed loop strings).

Fig. 2 shows the two gravitons attached to the brane, each at a single point.

Fig. 3 shows the 2 gravitons, A and B, splitting, so that each now has two attachment points (A1, A2, B1, B2) on the brane. Physically, this may mean that the gravitons are converted into some other kind of string, i.e. a different kind of particle, but for the purposes of illustration, I will continue to call them gravitons.

Fig. 4 shows attachment point B1 of graviton B moving under the arch of graviton A.

Fig. 5 shows the two attachment points of graviton B merging to become one point, so that graviton B is now looped around the arch of graviton A.

Fig. 6 shows graviton B detaching from the brane but still linked around the arch of graviton A.

Fig. 7 shows the two attachment points of graviton A merging to become one point on the brane.

Fig. 8 shows graviton A detaching from the brane so that there is now a 2-link chain of gravitons free from the brane.

The brane has served as the “catalyst” to link the two gravitons. One can readily see how 1D, 2D and 3D structures of linked gravitons could be formed using the above mechanism. We have here the conceptual beginnings of a Plancktech. Perhaps a Planck scale equivalent of molecular biology’s DNA and ribosomes could be used to “program” the formation of 3D Plancktech structures?!

Googolects

In earlier essays to Humanity Plus magazine, I wrote about my idea of SIPI (Search for Infra Particle Intelligence) i.e. the idea that our 21st century nanotech based artefacts (massively intelligent artificial intellects) would quickly realize that if they based themselves on a femtotech, using the properties of quarks and gluons to build structures and compute with, then they could outperform a nano based artefact by a factor of a trillion trillion (given the trillion cubed

greater density of components, and the trillion fold greater inter component signaling speed.) Similar logic extended all the way down to the Planck scale leads one to suggest the existence of creatures based on the Planck scale whose performance would be more than a googol (10^{100}) times superior to our pathetic attempts at nanotech. These creatures are probably billions of years older than we are since their suns may have formed several billions of years before ours, which is only a third of the age of our universe. These “googolects” would be undetectable to us and so hugely in advance of us, that they probably totally ignore us in our massive stupidity, which may answer the Fermi paradox, “If intelligent life is commonplace in the universe, why does humanity not have any evidence of its presence?”

To M-Theorists

If you are an M-Theorist, perhaps you might care to criticize the above ideas or to flesh them out in M-Theory math, which I’m in the process of teaching myself but have not yet mastered. (I’m still wading

through the swamp of the heavy math and math physics needed – e.g. Lie Theory, Topology, Manifold Theory, Quantum Field Theory, Particle Physics, etc.)