

ESSAY

# The One Question: What Do the Planck Units Actually Mean?

*Theoretical physics has spent decades circling a riddle it rarely names out loud.  
The Panvitalistic Theory proposes that the riddle is the whole problem —  
and that it has a geometric answer.*

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In 1899, a year before he opened the quantum era, Max Planck noticed something that has haunted physics ever since. By combining three constants of nature — the gravitational constant  $G$ , the speed of light  $c$ , and what would become his own constant  $h$  — one can build units of length, time, mass and energy that refer to no particular object, no metre bar in Paris, no chosen planet. Units, Planck thought, that any civilisation anywhere in the universe would arrive at. Natural units. Universal ones.

The Planck length is about  $10^{-35}$  metres. The Planck time,  $10^{-43}$  seconds. For more than a century these numbers have been treated as the bedrock of reality — the scale at which space itself is supposed to become grainy, where gravity and the quantum must somehow merge, where the known laws give out.

And here is the quiet truth at the centre of modern theoretical physics, the one rarely stated so plainly: **almost every major programme of the last fifty years is, at heart, an attempt to explain what the Planck scale actually is.** String theory builds its vibrating strings at that length. Loop quantum gravity quantises space into chunks of that size. Wolfram's hypergraphs, cellular automata, causal sets — all of them reach for a discrete bottom layer of reality set, one way or another, at the Planck scale. They differ in mathematics, in elegance, in ambition. They agree in what they are circling: the riddle Planck left in 1899.

## Stagnation, and what it really means

It is no secret that this enterprise has stalled. For decades, fundamental theoretical physics — not the applied, experimental physics that continues to thrive, but the search for the deepest laws — has produced an ever-growing forest of mathematically possible theories, almost none of which can be tested. New contributions address ever-finer corners of the problem while the central wound, the irreconcilability of quantum theory and general relativity, has been quietly accepted as a permanent condition. The field generates mathematics faster than it generates understanding.

The Panvitalistic Theory (PVT) offers an unsettling explanation for why. The proliferation is not a sign of richness. It is a symptom of a lost criterion. Once you accept the Planck units as *natural, unit-free measures* — as genuine empirical facts about reality — you believe you have reached a clean floor on which mathematics speaks directly to nature, with no conventions left running underneath. And on a floor believed to be clean, anything you can build that is mathematically consistent looks like a legitimate model of the world. There is no longer any way to tell a description of nature apart from a beautiful mathematical object. Both look the

same. That is the landscape of  $10^{500}$  possible universes, of multiverses, of theories chosen by taste — and it follows directly from treating the Planck scale as a fact rather than as an artifact.

## Turning the idea of a “theory of everything” on its head

The usual expectation of a *theory of everything* is that it must explain everything — every particle, every force, every number. The PVT proposes the opposite, and far more modest, criterion. A theory of everything need not solve all the problems of physics. It must solve **one**: it must answer Planck’s question of 1899. *What do these units mean, geometrically?* Everything else either follows from that answer or dissolves with it.

This reframing is itself a contribution, because it consolidates a sprawling, stagnant field onto a single, well-posed target. Stop asking which exotic mathematical structure might be the theory of everything. Ask instead: which proposal can finally say what the Planck units *are* — not as mystical thresholds, but as geometry?

## The PVT’s answer: the units were never fundamental

The PVT’s answer is blunt. The Planck units are not fundamental scales of nature. They are mathematical artifacts, created to paper over a single error — the wrong dimension of Planck’s constant  $h$ .

To see this, follow the dimensions. In standard physics, energy appears in two guises:  $E = mc^2$ , energy as mass, and  $E = hf$ , energy as frequency. For these to be dimensionally compatible,  $h$  is forced into a particular dimensional form. But that compatibility was imposed under an assumption — that time is an external, one-dimensional parameter ticking away independently of space. It is the same assumption met throughout this series: the external time that physics adopted when it declined to treat the angle as a real dimension. The dimension of  $h$  in standard physics is not a free-standing mistake. It is the inevitable consequence of that external time.

Give time its proper nature — internal angular curvature, the dimensioned relation  $\pi = T/L$  between angle and length — and the dimension of  $h$  changes accordingly. And now something remarkable happens. Every Planck unit, rebuilt from  $G$ ,  $c$  and the corrected  $h$ , collapses into a pure power of that single quantity  $\pi = T/L$ . Not a mysterious natural scale, but a rung on a geometric ladder:

- the Planck mass becomes simply  $\pi^1$ ,
- the Planck length,  $\pi^4$ ,
- the Planck time,  $\pi^5$ ,
- the Planck area,  $\pi^8$ ,
- the Planck volume,  $\pi^{12}$ ,

and on the other side, downward,

- the Planck energy,  $\pi^{-1}$ ,
- the Planck force and frequency,  $\pi^{-5}$ ,
- the Planck power,  $\pi^{-6}$ ,

all the way to the Planck pressure at  $\pi^{-13}$ . A whole tower of “fundamental scales of nature,” from  $\pi^{12}$  to  $\pi^{-13}$ , turns out to be nothing but the integer powers of one geometric relation between an angle and a length.

Read this way, the Planck scale is not a place in nature where space becomes grainy. It is the point at which the angle-to-length projection reaches its maximum — full orthogonality, the right angle — and beyond which the standard framework, having discarded the angle as a dimension, simply has no further language. The graininess was never in the world. It was the

edge of the model.

## Why this would change everything

This is the discovery that set the whole programme in motion. In the first PVT paper, in 2019, one finding stood out above the rest, and it was understood even then to be the dangerous one: that Planck's constant carries, in the standard framework, the wrong dimension — wrong not in the sense of a miscalculation, for the standard mathematics is internally consistent, but wrong in the sense that its dimension conceals the true geometric nature of  $h$ . The dimension is consistent *within* a flawed choice of scales, and it is exactly that choice the PVT removes.

If this holds — if  $h$  truly belongs to the geometry of angle and length rather than to an external clock — then it does not adjust the standard model at its edges. It moves the floor. The Planck scale, the last surviving remnant of the external-time assumption, dissolves entirely, and what remains is not a grainy bottom layer of reality but a rational comparison of finite volumes: physics as the honest measurement of one real thing against another.

The deepest unsolved problem of theoretical physics, on this view, was never a missing equation. It was a misread unit, set down in 1899, accepted as nature ever since. The question is no longer whether someone will build a more elaborate theory. It is whether the field is willing to ask Planck's old question once more, and to accept that its answer may be embarrassingly simple: a single angle, measured against a single length.

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