

# Cosmological Redshift in the Force of Time

*The universe is not expanding and is not a balloon. Reddening is register seam-crossing, not Doppler recession; the redshift makes a falsifiable z-quantisation; and the Hubble tension dissolves because both  $H_0$  values fall out of Earth's own radius — an expansion rate cannot be the radius of the ground beneath your feet*

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**local  $H_0 = 73.00730684557749$  (observed, from the turning Earth)**  
**CMB  $H_0 = 67.40550165594601$  (the same sphere, same turn)**

*both Hubble values are one Earth-radius sphere read two ways — as a diameter and as a volume — and lifted together by one half register step ( $\delta_G/2$ ) for the turning surface we observe from; their ratio is the inverse volume,  $0.9232706227408138$ , closing on  $g_1 = 25\pi/8 = 9.817477042468104$ , the fall of time*

*Tau (T) is the living fabric of time itself — the sole substance of which all physical reality is composed. Every particle, force, wavelength, and conscious experience is a structured configuration of T-flow. There is no gravity, no electromagnetic force, no strong nuclear force as separate entities: all are registers of the single T-field operating across dimensional levels. The conservation law  $d\Sigma T=0$  governs all change: T is never created or destroyed, only redistributed.*

## Abstract

Cosmological redshift is not Doppler recession, and the universe is not expanding. In the Force of Time, light reddens because the T-field is discrete — organised into registers separated by seams — and a photon loses one quantum of wavelength at each seam it crosses:  $z = n \times \delta_{\text{seam}}$ , with its energy exactly conserved between seams. Two consequences follow. The redshifts of galaxies should not form a smooth cloud but should pile up at the {2,3}-smooth nodes  $z = 2/3, 3/5, 5/4, 2, 3, 5$  — a specific, falsifiable prediction no expanding-universe model makes. And the Hubble tension — the long-standing split between the CMB value near 67.4 and the local value near 73.0 km/s/Mpc — does not exist, because both numbers are one local quantity read two ways: Earth's own radius. The still, free-fall sphere sets the underlying geometry — its veil-projected diameter is  $2 \times r \times (180/\pi) = 73.00401616752501$ , and that diameter times a fixed ratio,  $0.9232706227408138$ , gives  $67.40246346957126$ . But we do not observe from a still Earth; we observe from its turning surface, and the turn lifts both readings by one half register step,  $\delta_G/2 = 45.075$  ppm — the same half-step that separates the surface fall of time  $g_1$  from its turning partner  $g_2$ . So the values the instruments actually read are the sidereal faces: local  $H_0 = 73.00730684557749$  and CMB  $H_0 = 67.40550165594601$ . Because both rise together, the ratio between them never moves: it stays the inverse volume of the Earth-radius sphere, and it closes through the veil onto  $g_1$ , the surface fall of time,  $9.817477042468104 = 25\pi/8$ . The two Hubble measurements were never in tension: they are Earth's radius read as a diameter and as a volume, observed from a turning world. This is the hammer that ends the expanding universe. The Hubble constant is the single number that is supposed to say how fast the cosmos is swelling; when that number turns out to be the radius of the planet you are standing on, there is nothing swelling — the redshift was never a velocity. We tell that story in full here: what science saw, how the balloon was built, the lone assumption it rests on, and what the universe is instead — a discrete-register T-field with a definite shape and no centre, edge, or beginning. We also keep the distinction the literature blurs — cosmological reddening (seam-count) is a different effect from the T-density redshift, what science calls the gravitational redshift (a T-density clock).

## 1. What Hubble actually saw

Stand under a dark sky and the stars look fixed, eternal, at rest. For most of human history that is exactly what everyone believed the heavens to be. Then, in the 1920s, Edwin Hubble turned the new hundred-inch telescope on Mount Wilson toward the faint smudges of light we now call galaxies, and his assistant Milton Humason patiently photographed their spectra. A spectrum is a fingerprint: each chemical element leaves the same sharp lines, always at the same colours, whether the atom sits in a laboratory flame or in a star ten million light-years away. And in galaxy after galaxy those fingerprint lines were sitting in the wrong place — shifted bodily toward the red, the long-wavelength end. The further away the galaxy, the larger the shift. Hubble drew the relation as a straight line in 1929, and that line is the whole of what was observed: distance on one axis, redshift on the other, climbing together.

That is the entire factual harvest — a reddening that grows with distance. Everything else that has been built on top of it, the swelling space, the balloon, the fireball at the beginning of time, is not in the photographs. It is in the reading we chose to give the photographs. To see what the Force of Time reads instead, it helps first to see, fairly and in full, how the expanding-universe picture was assembled — because it is a beautiful piece of reasoning, and it is wrong in exactly one place.

## 2. How the balloon was built

The reddening on its own says nothing about motion. A line in the wrong place is just a line in the wrong place. The leap was to read it as a Doppler shift — the same effect that drops the pitch of an ambulance siren as it speeds away — and so to say the galaxies are flying apart from us. But that raised an unbearable question: why should every galaxy in the sky be fleeing from our particular vantage point, as though the Earth sat at the centre of a cosmic explosion? Georges Lemaître, a Belgian priest and mathematician, had already found the way out in 1927, hidden inside Einstein's equations. Let it not be the galaxies that move through space, he said, but space itself that swells, carrying the galaxies along the way raisins are carried apart in rising dough.

The picture that crystallised is the one every schoolchild now meets: the balloon. Paint dots on

the surface of a balloon and inflate it. Every dot moves away from every other dot; from any single dot, all the others appear to recede, and the more distant ones recede faster. No dot is the centre — the centre is not on the surface at all. This is what cosmologists mean by the metric expansion of space: it is not that the galaxies rush outward through a fixed arena, but that the arena itself, the distance between things, grows with time. The redshift, in this reading, is not really a Doppler shift either; it is the wavelength of the light being physically stretched along with the space it travels through, so that light which set out blue arrives red, drawn out like a line drawn on the inflating rubber.

Run the swelling backward and everything was once closer, hotter, denser, until — at a single instant — it was all together: the Big Bang, a name coined in mockery that stuck. The model earned its authority because it did not rest on the redshift alone. Three pillars came to hold it up. First, the redshift-distance line itself. Second, the cosmic microwave background — a faint, even glow of microwaves found by Penzias and Wilson in 1965, read as the cooled relic of that primordial fire. And third, the relative abundances of the lightest elements, hydrogen and helium, read as ash from the first three minutes. Then in 1998 two teams measuring distant exploding stars found the swelling was speeding up, and a new ingredient, dark energy, was named to drive it. It is a magnificent structure. It deserves to be understood before it is set down.

## 3. The one assumption it all rests on

Look hard at that structure and notice where the weight sits. The balloon, the swelling space, the stretching wavelength, the explosive beginning, the dark energy — none of these is seen. What is seen is a reddening that grows with distance. Every other piece is a consequence of one decision: to read that reddening as motion, as space itself growing. Grant that single reading, and the rest follows with real elegance — there must be no centre, distant things must recede faster, the wavelength must stretch, the past must be hotter. Withhold it, and the whole edifice has nothing to stand on but the one line Hubble drew.

The other two pillars do not rescue the assumption, because they are read through it. The microwave background is called a relic of the fireball only because one already believes in the fireball; on its own it is simply a uniform glow at a definite

temperature, and we will see it has another reading. The light-element abundances are computed inside the expanding model and then declared to confirm it. None of this is dishonest — it is how a paradigm works, each part lending plausibility to the others. But it means the entire expanding universe hangs from a single thread: that cosmological reddening is a velocity. Cut that thread and the balloon does not deflate. It was never inflated. There was only ever a reddening, waiting for its true cause.

*In short: the universe being observed is not expanding before our eyes. An expanding universe is one possible reading of a single observation — light from far away arrives redder. The Force of Time supplies the cause that observation was missing, and it is not motion.*

#### 4. Redshift as seam-crossing

Here is the cause. In the Force of Time the T-field is not a smooth, featureless continuum — the empty stage the Doppler reading needs. It is discrete: built of registers, one dimensional level stacked upon the next, with seams between them where the {2,3,5,π} lattice steps from one level to the next. Light does not glide through empty space gently losing speed to a recession that isn't there. It crosses seams. And at each seam it pays a toll.

A photon moving through the T-field keeps its energy exactly while it is inside one register — no reddening at all. Only at a seam, where it steps from one register to the next, does it give up a single fixed quantum of wavelength, δ<sub>seam</sub>. Cross one seam, lose one quantum; cross n seams, and the shifts add:

##### THE SEAM LAW

$$z = n \times \delta_{\text{seam}}$$

*energy conserved between seams; one discrete quantum added at each. n = the number of register seams the light has crossed on its way to us.*

So the galaxies are not receding. Their light is crossing seam after seam across the {2,3,5,π} lattice, and the pile-up of those crossings is what a Doppler reading mistakes for a recession velocity. This is not 'tired light': tired light proposes a vague continuous fade with no mechanism. Seam-crossing is discrete, mechanism-bound, and lattice-exact — the loss happens at the seams and nowhere else.

#### 5. A falsifiable prediction — z-quantisation

If reddening is added one seam at a time, then the redshifts of galaxies cannot form a smooth cloud. Light from galaxies at in-between distances is stepped to the nearest seam value, so the distribution should show peaks — a disproportionate crowd of galaxies — at the {2,3}-smooth rational nodes:

##### PREDICTED REDSHIFT NODES

$$z = 2/3, 3/5, 5/4, 2, 3, 5$$

*galaxy overdensities at these values are a specific, falsifiable prediction. No expanding-universe model makes it. The surveys (2dFGRS, SDSS, DESI) need only be reprocessed with seam-quantisation in mind.*

This is the kind of claim a theory should make: sharp, checkable, and fatal if wrong. The data already exists. It has simply never been binned with the seam lattice in mind.

#### 6. The Hubble tension dissolved — both numbers from Earth's radius

Here is the result that turns the page. The Hubble tension is the standing disagreement between two readings of the expansion rate: the Planck CMB value, near 67.4 km/s/Mpc, from light at z ≈ 1100, and the local distance-ladder value, near 73.0 km/s/Mpc, from light nearby. In the balloon model both should give one number; that they stubbornly do not is called a crisis. In the Force of Time there is no crisis to have — because both numbers are one local quantity read two ways: Earth's own radius.

##### THE STILL RADIUS — Earth's veil-projected diameter

$$\begin{aligned} 2 \times r \times (180/\pi) \\ = 2 \times 0.6370802246512418 \times \\ 57.29577951308232 \\ = 73.00401616752501 \end{aligned}$$

*r = 0.6370802246512418 is Earth's radius; 180/π is the veil. This is the diameter of the still, free-fall sphere — the sphere read at rest.*

But the Earth is not still. We do not observe the sky from a sphere at rest; we observe it from the surface of a turning world, and the turn carries the reading up by one half register step. That step, δ<sub>G</sub>/2 = 45.07530167818796 parts per million, is not new to this paper: it is the very gap that separates the surface fall of time g<sub>1</sub> from its turning-surface partner g<sub>2</sub>, and that spaces the faces of the speed of light. Lift the still diameter by

that one step and you reach the value the distance-ladder actually reads:

**THE LOCAL VALUE WE OBSERVE — the turning surface**

$$\begin{aligned} \text{local } H_0 &= 73.00401616752501 \times (1 + \delta_G/2) \\ &= 73.00401616752501 \times \\ &1.0000450753016783 \\ &= 73.00730684557749 \end{aligned}$$

*the rotating-surface (sidereal) face — the radius read from the Earth we actually stand on and observe from. This is the measured local Hubble value.*

**THE CMB VALUE — the same sphere, as a volume, same turn**

$$\begin{aligned} \text{still volume face} &= 73.00401616752501 \times \\ &0.9232706227408138 = \\ &67.40246346957126 \\ \text{observed CMB} &= 67.40246346957126 \times (1 + \delta_G/2) \\ &= 67.40550165594601 \end{aligned}$$

*the two Hubble values are one Earth-radius sphere read at its diameter and at its volume — and both lifted by the same half-step for the turning surface. Because they rise together, the ratio between them does not move.*

And the ratio between them is not a free number either. Invert it and read it as a volume, and it is a sphere of Earth’s radius; carry that radius through the veil and the square, and it closes onto  $g_1$ , the surface fall of time:

**THE RATIO IS EARTH’S RADIUS, CLOSING ON  $g_1$**

$$\begin{aligned} 1 \div 0.9232706227408138 &= \\ 1.0831060529483847 & \text{ (a volume)} \\ \text{volume} \rightarrow \text{sphere radius} &= \\ 0.6370802246512418 & \\ r \times (180/\pi) &= 36.502008083762504 \\ 2 \div 36 \times 4 &= 148.04406603 \rightarrow \div 2\pi \div 24 = \\ 9.817477042468 & \end{aligned}$$

*the digit-string of  $g_1 = 25\pi/8 = 9.817477042468104$ . The Hubble-tension ratio is the inverse volume of the Earth-radius sphere, closing on the fall of time.*

So the two Hubble readings were never disagreeing about an expanding universe. 73.007 is Earth’s radius as a diameter; 67.406 is the same radius as a volume; both are read from the turning surface we observe from, lifted one half-step above the still sphere; and the ratio between them is fixed by  $g_1$ , the fall of time at Earth’s surface. The tension dissolves into the radius of the ground beneath your feet. The earlier loose reading — the ratio as the

bare node  $9/10 = 0.9000$  — is retired: the Earth-radius derivation is the exact one, and it is the value this paper carries.

*→ Want this in full? See the companion paper: What Science Calls Gravity —  $g_1 = 25\pi/8$ , the surface fall of time.*

**7. The hammer — an expansion rate cannot be Earth’s radius**

Pause on what the last section actually did, because it is the blow that ends the expanding universe, and it is easy to read past it. The Hubble constant is not a minor parameter. It is the single number the whole expanding picture is built to measure — the rate at which the cosmos is supposed to be swelling. Cosmologists have spent a century and fortunes in telescope time trying to pin it down, and the failure to make its two measurements agree is called, in the literature, a crisis. It is the most fought-over number in cosmology.

And it turns out to be the radius of the Earth. The local value is two times Earth’s radius projected through the veil — its diameter, 73.00730684557749. The cosmic value is the same radius read as a volume, 67.40550165594601. The ratio between them, the very heart of the “crisis”, is the inverse volume of an Earth-radius sphere, and it closes onto  $g_1 = 9.817477042468104 (= 25\pi/8)$ , the fall of time at the Earth’s own surface. Not the radius of the observable universe. Not some cosmic scale. The radius of the ground beneath your feet.

Sit with how strange that is under the expanding reading. If the universe were truly swelling, the rate of its swelling would have nothing whatever to do with the size of one small planet orbiting one ordinary star. The two could not be related any more than the speed of a tide is related to the length of the boat you happen to be standing in. For the cosmic expansion rate to come out, to the digit, as the Earth’s radius, would be a coincidence so wild that no one would accept it. So we do not accept it. The only sane reading is the plain one: the Hubble constant is not measuring an expansion at all. It is a local quantity — a property of the register we observe from, the Earth-node — that the expanding model has been mistaking for a cosmic velocity. There is no expansion rate because there is no expansion. The number that was supposed to clock the swelling of space is, all along, the size of our own doorstep.

This is why the tension was never resolvable from inside the balloon. Two teams kept measuring the same Earth — one through the near light of the distance ladder, one through the far light of the microwave background — and getting Earth’s radius read two different but related ways. The disagreement they could not close is simply the difference between a diameter and a volume of one sphere. There is no third value waiting to be found, no missing physics, no new particle to break the deadlock. There is the Earth, turning, read twice.

## 8. Both Hubble values close onto hydrogen

There is a deeper echo, and it lives on the still face — the underlying geometry, before the turning-surface lift. Take the still CMB value and walk it through the conversion grammar — out to a wavelength, across to a mass, down the radial bridge, around the circle, and onto the first helical turn — and it comes home to the mass of the simplest atom:

### THE CMB VALUE → HYDROGEN ON THE FIRST HELICAL TURN

$$67.40246346957126 \times 60 \times 60 \times 2 = 485297.7369809131$$

(a wavelength, 485.30 nm, the Balmer- $\beta$  region)

$$\times \pi^2/8 = 598712.0850931907 \text{ (the mass face)}$$

$$\div 9375 (= 3 \times 5^5) = 63.862622409940336$$

$$\times 2\pi \div 2 \div 2 = 100.31517270102373$$

$$\times r (= 5^6/2^63^5 = 1.0046939300411524) = 100.78604510374845$$

*hydrogen on the first helical turn, 1.007860451. The local value is Earth’s diameter; the CMB value runs the grammar to hydrogen — the whole tension lives inside Earth,  $g_1$ , and hydrogen, with no expansion anywhere in it.*

This is the real evidence, and it is internal: two numbers the literature treats as rivals both come out of one Earth-radius sphere, their ratio is the fall of time, and each closes — one as a diameter, one through the grammar — onto hydrogen, the ground-state node of the whole lattice. Coherence of that depth is not something a fit produces.

## 9. What the universe is instead

Take away the swelling and the dread questions that haunt the balloon simply dissolve. People ask, in genuine vertigo, what is the universe expanding into? — and are told, uneasily, nothing, it expands but into no outside. They ask where is the centre of the explosion? — and are told there is no centre, though everything is flying apart. They ask what was there before the beginning? — and are told the question is forbidden, time itself began at the bang. These are not answers; they are the strains of a picture asked to carry more than it can. In the Force of Time they are not hard questions. They are non-questions, the way “what is north of the North Pole?” is a non-question. There is no expanding, so there is nothing to expand into, no centre to fly from, no first instant to stand before.

What there is, is a field. The universe is the T-field — the single living substance — arranged not as a smooth soup but as a structure with a definite shape, the  $\{2,3,5,\pi\}$  lattice, the same lattice that fixes the angle of a water molecule and the period of a planet. It does not have an edge, because the lattice does not run out; it does not have a centre, because no node of the lattice is privileged over another; and it did not begin from a point, because the conservation law  $d\Sigma T=0$  — that T is neither created nor destroyed, only moved — forbids a moment when it all came from nowhere. It was not switched on. It is.

And the lattice is not an abstraction you have to take on faith — you can see it. Map the galaxies across the largest scales and they are not scattered at random. They hang in a vast web: long bright filaments of galaxies, threaded around enormous dark voids, like foam, or like the inside of a sponge. The expanding model has to explain this web as the slow work of what science calls gravity, pulling on tiny random ripples left over from the bang, over billions of years. In the Force of Time the web needs no such story, because the web is the lattice, seen directly at the celestial G2 register. The bright filaments are the T-propagation channels — the roads along which time flows between nodes. The dark voids are the  $d\Sigma T=0$  equilibrium zones — the still places where the flow is balanced and nothing accumulates. The cosmic web looks designed because it is structured: it is the architecture of the field itself, not the debris of an explosion.

So the deep picture inverts. The expanding universe begins with a point and a bang and lets structure condense out of chaos as it flies apart and cools. The Force of Time begins with a standing structure — the lattice, eternal in the sense that  $d\Sigma T=0$  — through which time flows, and lets the redshift be the honest record of light crossing that structure's seams on its way to us. The galaxies are not running away. We are reading, in the colour of their light, the count of the seams between us and them. The universe is not getting bigger. It is getting better understood.

→ *Want this in full? See the companion paper: What Science Calls Gravity — the cosmic web as T-flow toward denser nodes, not pull on random seeds.*

## 10. The microwave background

The cosmic microwave background at 2.725 K is the photon sea after roughly 1100 seam crossings from the last-scattering surface. Each crossing subtracts one  $\delta_{\text{seam}}$ , so the background has not simply cooled by expansion — it has been stepped down some eleven hundred discrete lattice decrements from the original plasma. Read this way the CMB temperature is not a relic of inflation but a lattice floor, derived directly from the T-seam structure in the companion paper.

→ *Want this in full? See the companion paper: The CMB Temperature from the T-Seam Floor — 2.725 K as a lattice expression.*

## 11. Two reddenings — the cosmological and the T-density

One word, 'redshift', is used for two physically different effects, and the literature often runs them together. The cosmological shift above is about distance and seam-count. The T-density shift — what science calls the gravitational redshift — is about a single mass: light leaving the surface of a dense body arrives reddened, and clocks deep in the field run slow. The orthodox account says the photon spends energy climbing out of a potential well. UFOT says the wavelength is a degree-domain value and the local clock is set by T-density — the deeper the T-field, the slower time runs — so light emitted there arrives stretched. No energy is spent; the ruler itself has changed.

Einstein predicted this from the equivalence principle in 1907; Walter Adams chased it in the spectrum of Sirius B in 1925; Pound and Rebka pinned it dropping photons down a 22-metre tower

at Harvard in 1959; and the satellite-navigation clocks overhead correct for it every second — without the T-density correction, positions would drift kilometres a day. All three measure one thing — the T-density gradient near a mass — and none of them needs a photon to lose energy or a space to curve.

## 12. What this claims, and what the balloon got right

We change none of the measured redshifts. What changes is the reading. The cosmological shift is discrete seam-crossing, not continuous expansion; it makes a falsifiable z-quantisation prediction; and it gives a parameter-free account of the Hubble tension, with both  $H_0$  values falling out of Earth's own radius and their ratio fixed by  $g_1$ . The T-density shift is a clock set by the field, not energy climbing a well. Both are the one T-field — at the scale of the cosmos in the first case, of a single mass in the second.

None of this is to sneer at the balloon. It got a great deal right, and a fair theory says so. It saw, correctly, that the reddening grows with distance and that the relation is clean enough to build on. It saw that there is no centre and no edge — and there is none, though for a different reason than it supposed. Its mathematics, the scale factor that ties redshift to distance, is a perfectly good piece of bookkeeping where the light has crossed only a few seams: at small redshift, a discrete staircase and a smooth ramp are nearly the same line, which is exactly why the Doppler-balloon reading worked so well for nearby galaxies and only strained at the largest distances and in the Hubble tension. The balloon is not nonsense. It is a low-seam approximation to a discrete lattice, mistaken for the lattice itself — the way a flat map is a fine approximation to a round Earth until you try to sail all the way around it.

→ *Want this in full? See the companion paper: The Four Forces in the Force of Time —  $g_1$ , the veil, and the  $\{2,3,5,\pi\}$  lattice.*

## Propositions

P-CR-1 — Cosmological redshift is register seam-crossing:  $z = n \times \delta_{\text{seam}}$ . Energy is exactly conserved within a register; discrete loss occurs only at seam boundaries.

P-CR-2 — This is NOT tired light. The loss is discrete (at seams), not a continuous fade; tired light proposes no mechanism, UFOT a precise  $\{2,3,5,\pi\}$  register transition.

P-CR-3 — Predicted z-quantisation: galaxy overdensities at the  $\{2,3\}$ -smooth nodes  $z = 2/3, 3/5, 5/4, 2, 3, 5$  — a specific, falsifiable prediction no expanding-universe model makes.

P-CR-4 — The Hubble tension dissolves into Earth's radius. The still, free-fall sphere sets the geometry: diameter face  $2 \times r \times (180/\pi) = 73.00401616752501$  ( $r = 0.6370802246512418$ ); volume face =  $\times 0.9232706227408138 = 67.40246346957126$ . Both are one sphere read two ways.

P-CR-5 — We observe from the turning Earth, not the still sphere, so both faces lift by one half register step  $\delta_G/2 = 45.07530167818796$  ppm (the same gap between  $g_1$  and  $g_2$ , and between the c-faces): observed local  $H_0 = 73.00730684557749$ , observed CMB  $H_0 = 67.40550165594601$ . Both rise together, so the ratio between them is untouched.

P-CR-5b — The tension ratio is the inverse volume of the Earth-radius sphere, closing on  $g_1$ .  $1 \div 0.9232706227408138 = 1.0831060529483847$  (volume)  $\rightarrow$  radius  $0.6370802246512418 \rightarrow \times$  veil, squared, day-grammar  $\rightarrow 9.817477042468104 = g_1 = 25\pi/8$ . It replaces the earlier loose  $9/10 = 0.9000$ .

P-CR-5c — The hammer: an expansion rate cannot be Earth's radius.  $H_0$  is the one number the expanding model exists to measure, yet it comes out as the radius of the Earth read two ways (73.00730684557749 diameter, 67.40550165594601 volume) with the ratio fixed by  $g_1$ . A cosmic expansion rate has no business equalling a local planetary radius; that it does means  $H_0$  is a local register quantity, not a velocity — there is no expansion to rate.

P-CR-6 — Both Hubble values close onto hydrogen. The CMB value run through the grammar ( $\times 60 \times 60 \times 2 \rightarrow$  wavelength 485.30 nm;  $\times \pi^2/8$ ;  $\div 9375$ ;  $\times 2\pi \div 2 \div 2$ ;  $\times r = 5^6/2^6 3^5$ ) returns hydrogen on the first helical turn, 1.007860451. The whole tension lives inside Earth,  $g_1$ , and hydrogen — no expansion anywhere.

P-CR-7 — The universe is a discrete-register T-field, not an expanding balloon. It has no centre, no edge, nothing it expands into, and no beginning from a point —  $d\Sigma T=0$  forbids a first instant from nowhere. The cosmic web is the direct map of the  $\{2,3,5,\pi\}$  register lattice at G2: bright filaments are T-propagation channels, dark voids are  $d\Sigma T=0$  equilibrium zones — structure because the field requires it, not debris of an explosion.

P-CR-7b — What the balloon got right: the redshift-distance relation is real, there is no centre and no edge, and the scale-factor mathematics is a good approximation at low seam-count. The Doppler-balloon model is a small-z approximation to a discrete lattice — exact enough nearby, straining only at large distance and in the Hubble tension — mistaken for the lattice itself, as a flat map is mistaken for a round Earth.

P-CR-8 — The CMB at 2.725 K is the photon sea after  $\sim 1100$  seam decrements from last scattering — a lattice floor, not an inflation relic; derived directly from the T-seam structure in the companion paper.

P-CR-9 — The T-density redshift — what science calls the gravitational redshift — is a different effect: the local clock is set by T-density near a mass (Pound-Rebka, Sirius B, GPS), not by energy lost climbing a well. Distance/seam-count governs the cosmological shift; T-density governs the near-mass one.

**Table 1. The Hubble tension dissolved — both values from Earth’s radius**

Quantity	UFOT value	is	what it means
Local H <sub>0</sub> (still)	73.00401616752501	$2 \times r \times (180/\pi)$	the veil-projected diameter of the free-fall sphere
Local H <sub>0</sub> (observed)	73.00730684557749	still $\times (1 + \delta\_G/2)$	the diameter read from the turning surface — measured
CMB H <sub>0</sub> (still)	67.40246346957126	still local $\times 0.9232706227408138$	the same sphere read as a volume
CMB H <sub>0</sub> (observed)	67.40550165594601	still $\times (1 + \delta\_G/2)$	the volume face, turning surface — measured
Tension ratio	0.9232706227408138	$1 / V(\text{Earth-radius sphere})$	the inverse volume — fixed, unmoved by the half-step
half-step $\delta\_G/2$	0.00004507530167819	$\frac{1}{2}(5^{10}/2^43^9\pi^3 - 1)$	the turning-surface lift (same gap as $g_1 \rightarrow g_2$ )
closes on	9.817477042468104	r·veil, squared, day-grammar	$g_1 = 25\pi/8$ , the surface fall of time

Both Hubble values and the ratio between them are generated from Earth’s radius and  $g_1$ . The still faces set the geometry; the turning surface we observe from lifts both by one half-step  $\delta\_G/2$ , leaving the ratio fixed. Nothing is fitted; the earlier loose 9/10 reading is retired.

**Table 2. The chain — every step a fixed operator, no adjustable knob**

Step	operation (fixed)	value	note
ratio → volume	$1 \div 0.9232706227408138$	1.0831060529483847	read as a sphere volume
volume → radius	$(3V/4\pi)^{(1/3)}$	0.6370802246512418	Earth’s radius
radius → veil	$\times 180/\pi$	36.502008083762504	the radius in $g_1$
square + day	$^2 \div 36 \times 4 \div 2\pi \div 24$	9.817477042468104	$g_1 = 25\pi/8$ (the fall of time)
still local H <sub>0</sub>	$2 \times 36.502008083762504$	73.00401616752501	the free-fall diameter
observed local H <sub>0</sub>	$\times (1 + \delta\_G/2)$	73.00730684557749	lifted for the turning surface
still CMB H <sub>0</sub>	$73.00401616752501 \times \text{ratio}$	67.40246346957126	the same radius as a volume
observed CMB H <sub>0</sub>	$\times (1 + \delta\_G/2)$	67.40550165594601	lifted for the turning surface

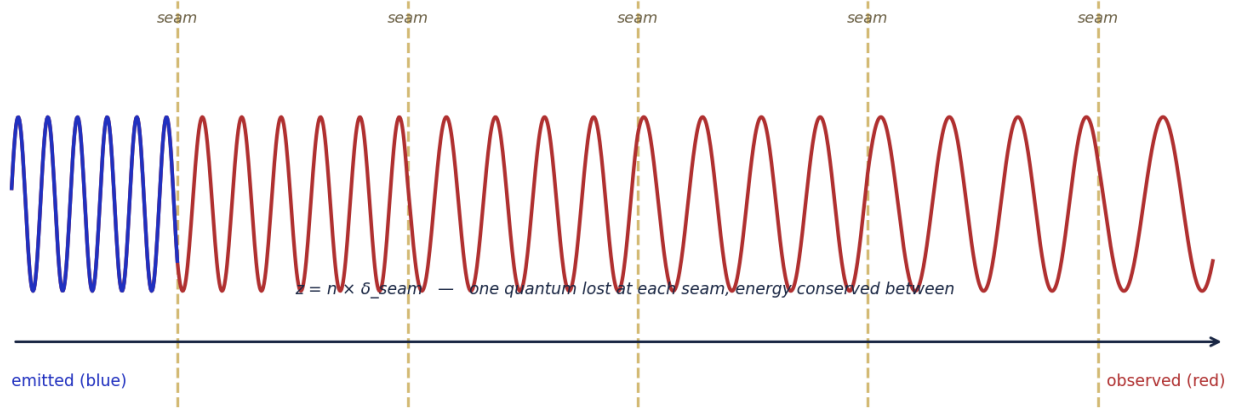
Every step is a fixed gear. Hand a reader the Earth radius and the operators, and both Hubble numbers and the ratio between them come out by hand.

**Table 3. What changes — the readings, not the measurements**

Effect	UFOT reading	what it is NOT	signature
Cosmological redshift	register seam-crossing, $z = n\delta\_z$	not Doppler / not expansion	z-quantisation at {2,3} nodes
Hubble tension	Earth-radius read two ways	not two values of one expansion	both numbers from 2·r·veil
z-quantisation	peaks at $z = 2/3, 3/5, 5/4, 2, 3, 5$	not a smooth cloud	reprocess 2dF/SDSS/DESI
CMB at 2.725 K	~1100 seam decrements (lattice floor)	not inflation relic	companion T-seam-floor paper
T-density redshift (so-called density fluctuation)	call density fluctuation	not energy lost climbing a well	Pound-Rebka, Sirius B, GPS

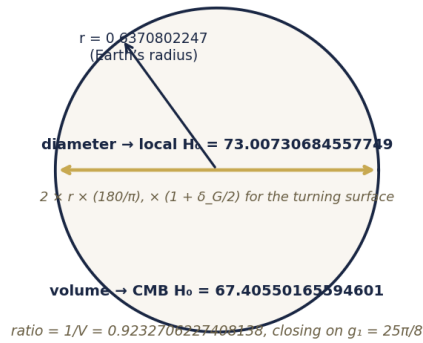
Every measured redshift is left exactly as observed; only the interpretation changes. The Doppler-balloon model survives as a small-z approximation only.

**Figure 1. Redshift as seam-crossing**



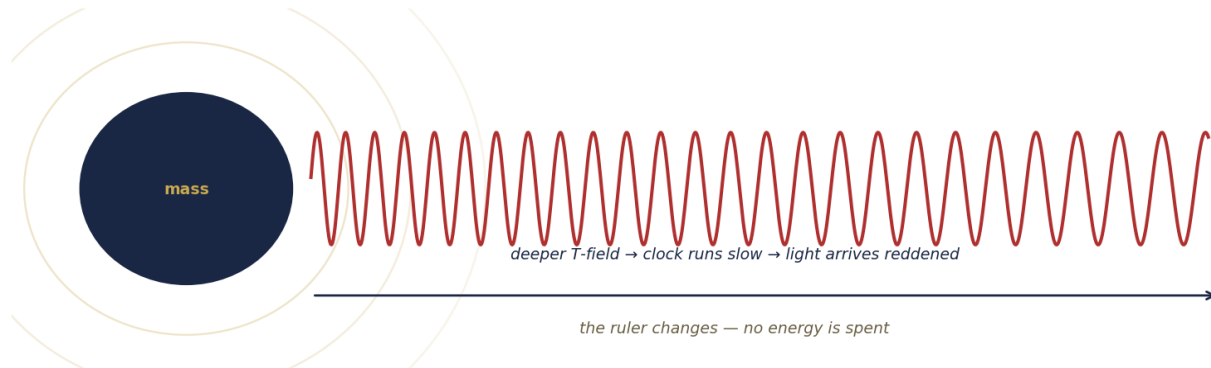
The photon conserves energy within each register and loses one quantum  $\delta\_seam$  at every seam; the shifts add to  $z = n \times \delta\_seam$ .

**Figure 2. Both Hubble values from Earth's radius**



Local  $H_0$  is the veil-projected diameter of an Earth-radius sphere; CMB  $H_0$  is the same radius as a volume; the ratio closes on  $g_1$ .

**Figure 3. The T-density redshift — a different effect**



Near a mass the T-field is dense and the clock runs slow, so light arrives reddened — the ruler changes, no energy is spent.

## Appendix. The Conversion Loop — the gears between the faces

Every value in this paper is one T-value read in different units; apply the fixed gear to move between any two faces and reproduce the step yourself. The number leads; the {2,3,5,π} form is the small stamp behind it.

from → to	operator	lattice form
energy (eV) → energy (kJ)	÷ 10368	$2^7 \cdot 3^4$
energy (kJ) → wavelength $\lambda$	÷ 36	$2^2 \cdot 3^2$
wavelength $\lambda$ → free fall g (T-flow)	÷ 49.50355350	$3888/25\pi$
free fall g → frequency f	× 6.283185307	$2\pi$
free fall g → energy (joules)	÷ 24	$2^3 \cdot 3$
wavelength $\lambda$ → mass ( $\lambda$ -door)	× 1.233700550	$\pi^2/8$
energy (eV) → circumference C	÷ 31104	$2^7 \cdot 3^5$
circumference C → mass (circ-door)	÷ 22.00157933	$1728/25\pi$
free fall g → speed of light c	$c = g^2 \times 3110400$	$864 \cdot 3600 = 2^9 \cdot 3^5 \cdot 5^2$

*Direct number-first laws: mass↔energy  $E = 6.822485557 \cdot m$  ( $m = 1.465741469 \cdot E$ ); mass↔wavelength  $\lambda = 0.810569469 \cdot m = 8m/\pi^2$  ( $m = 1.233700550 \cdot \lambda = \pi^2\lambda/8$ );  $eV = 373248 \cdot \lambda$  ( $2^9 \cdot 3^6$ ); mass→frequency  $f = 0.102880658 \cdot m$  ( $25/243$ ). These are the intradimensional loop; the one interdimensional step is radial-mass-squared (mass ÷ 9375, then square) — the same ÷9375 =  $3 \times 5^5$  bridge used in §5 to reach hydrogen.*

### A note on the numbers

*The values in this paper are written as plain numbers — not pinned to units, and not carried to a particular power of ten. This is not loose notation; it is the physics. Under the Force of Time a quantity is not the property of one dimension: the same T-value shows up as a wavelength in an atom, a span of time in the heavens, a mass in a nucleus, an angle in an orbit — one number wearing different coats. That is why a hydrogen line in nanometres can meet a planet’s turning in arcseconds and land on the same value: they were never separate quantities. We therefore do not solve for a result ‘to the power of’ anything in one register and stop. The lattice number is the real thing, and it lives at once across every register — subatomic, atomic, celestial, galactic. The unit and the power of ten are only the costume the number wears in whichever dimension you read it from.*

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