Article

The Structure of Time & the Emergence of Gravity through Event Flows

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Abstract

The traditional treatment of time in physics – as introduced by Einstein in special relativity – rests on a conceptual misclassification, like several other persistent ambiguous views in physics, which also will be highlighted in the following. Time, originally a scalar, has been inaccurately elevated to the status of a geometric dimension through mathematical substitution rather than physical reasoning. This misconception has endured to date despite its failure to explain key physical phenomena such as causal flow, symmetry-related inconsistencies, the structure of spacetime cones, and complex gravitational relationships. Like space, time must be considered a three-directional dimension in its own right. A structured formulation was proposed previously, treating it as an anisotropic entity embedded in a nearly flat spacetime, where also space is not completely orthogonal. This approach not only addresses inconsistencies in the conventional Minkowski interpretation of not interconnected future and past cones, but it offers a richer explanation for event realisation and causal flow. Another essential point is considered in the context of the 3S+3T framework: gravity. It is considered as a force rather than a field causing curvature.

Keywords: Geometrical time, event flow, symmetry dogma, cosmological anisotropy, emergent gravity, new arrow of time.

1. Introduction

The 3S+3T framework, introduced in earlier essays, laid the groundwork for treating Time as a genuine three-directional dimension interlinked with Space. Although not flawless – not only because of insufficient argumentation, but also because of rather lax peer review – these essays laid the cornerstones: the concept of a nearly flat, quasi-observable universe and an intense interaction between future and past cones. The proposed model permits continuous event transition between the cones, and thus resolves the causality gap in Minkowski Space. Contrary to Minkowski's view that most of our universe is *invisible*, the assumption that the bent time axis τ proves logical: it plays the role of the asymptote of the time cones. With the proposed minute tilt of the τ-axis relative to t and θ, there is a quasi-flat universe [1].

The event transition between future and past cones also laid the basis for an event-based arrow of time, which will be discussed in subsequent paragraphs. What remained open were the finer implications of anisotropy, probability, and gravity – questions that could not be settled within the earlier scope. The present essay takes up these threads, aiming at a clearer formulation of

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event transition, causal flow, and the physical meaning of curvature and force within the 3S+3T setting.

Another important notion, on which the model is based is probability, not only in the sense of Heisenberg's uncertainty principle

$$\Delta x \cdot \Delta p \geq \frac{\hbar}{2}.$$

It is also a fundamental notion in the 3S+3T framework [2].

Furthermore, Euclidean mathematics as a concept does not seem totally appropriate for our universe, which is fundamentally asymmetric, i.e. not constructed on symmetry and orthogonality. The next step was to anticipate a similar tilt to the z-axis of Space in accordance with the tilt of θ [3]. This step reinforces the bias which was introduced by a tilted τ-axis, leading to potentially observable anisotropies – already detected in quantum physics and several domains in cosmology, as documented in CP violation in particle physics, and large-scale cosmic anisotropies. Among many other things, also gravity has to be reviewed: as a force rather than a field causing curvature, thus offering a richer explanation for event realisation and causal flow.

It is not only the rigidity of today's physics that breaks down out-of-the-box thinking: it is definitely the sloppiness applied – perhaps involuntarily – when describing fundamental physical events, such as "photons travel as small bullets through space", defying the wave-particle duality. Or the attribution that photons are polarised – which would mean that a photon possesses a *vector hat*, designing its polarisation. Or the fact that a scalar is attributed the properties of a dimension in Einstein's 4-"dimensional" spacetime.

Finally, this essay also tries to contribute to a return to more precise diction in physics, opening ways to interpret our universe differently and more precisely.

2. Fighting Misconceptions

It must be pointed out that the persistence of describing wave-functions as moving particles is a linguistic holdover, not a physical truth. Not only within a structured, event-based temporal geometry, the photon emerges at the moment of interaction with matter – and only then does any time concept meaningfully describe its evolution [4]. Unfortunately, this description of the dual behaviour of light as wave and particle is not really present in the minds of many physicists. Mistakenly, many of them propagate that there are actually photons – imagined as tiny balls – cruising with light speed through space and atmosphere. Pupils and students of all levels are guided to believe this, since it is perpetuated in textbooks from high-school level to university and beyond. And it seems that nobody really cares that this view completely misrepresents its ontological status [5].

Such misconceptions also extend into terminology: take the oft-cited notion of "photon polarisation", or of "photon redshift". Strictly speaking, polarisation refers to the orientation of the oscillating electric field vector in a classical electromagnetic wave, i.e. it is a field phenomenon, as is "redshift" [6]. Likewise, the redshift observed is not the observed effect on a photon, but on the electromagnetic field that transports the energy of a photon to the location of realisation. It must be recognised that a photon does not exist as an independent, observable entity until it interacts; it only manifests through absorption events. Hence, attributing a classical wave property to a not-yet-interacted quantum excitation conflates field modes with discrete events.

Undoubtedly, these examples reveal an unpardonable scientific sloppiness that has persisted from the past century to the present. Much of the confusion arises from ill-defined concepts of '*dimension*' and '*photon*,' the two most persistently misleading terms. To call time a dimension without giving it dimensional properties is to commit a category error of the highest order [7]. The result is that over a century of physics built atop a linguistic shortcut. In the model described in former publications, this shortcut is strictly revoked [2 b].

3. The Myth of Time as a Fourth Dimension

Modern physics treats Time with striking ambiguity, based on the formalism of Einstein's special relativity, where he introduces time not as a spatial analogue, but as a coordinate scalar embedded within a geometric framework. Although t appears alongside spatial coordinates x, y, z in the four-vector $x^\mu = (ct, x, y, z)$, it lacks intrinsic directionality or extension. Yet, it is merely a parameter – continuous, absolute for each event, meaning that its value is definite for any event, but observed differently in different frames under Lorentz transformations [8].

Einstein never truly geometrized time: in his formalism it was only a label for registering an event, not a dimension shaping events. Though he employed a geometric framework for mathematical convenience, this did not endow time with special characteristics. And that is the crux: time in Einstein's model is not a dimension in any active, spatial sense – it is a scalar wrongly elevated to the status of one [9]. Yet, Einstein himself began referring to time as the "fourth dimension," and from there, a serious – and erroneous – semantic drift took root: a scalar attributed the label "dimension", as well as spatial axes turning into "dimensions".

Obviously, at that time – more than 120 years ago – literally nobody imagined time as a dimension like space: multidirectional. The misconception that the then scalar t was attributed the label of a dimension spread out and still feeds a persistent delusion – not only among theoretical and applied physicists, but across multiple scientific domains. The delusion lives on today: schoolbooks still teach "time as the fourth dimension," cosmologists still chart it as if it were just another axis, and even quantum gravity programmes quietly reintroduce the scalar t under the label of a dimension.

A similar semantic confusion persists in quantum theory when talking of photons: originally, a photon is not a "thing": it is the result of the interaction of a probability wave with an obstacle. A photon is not a self-contained particle, but the realised outcome of a wave encountering a boundary or obstacle. It does not travel along a defined path; there is no classical trajectory, no light 'in flight'. What is at the origin of the photon's manifestation is a spherical wave, described by Schrödinger's wave packet concept. Misinterpreting the particle-wave duality this way distorts our understanding of causality and event realisation [10]. The photon in the 3S+3T model is a probability construct: it becomes realised only upon interaction, crossing the PTU, triggering memory. Until then, it's not a photon – it's a potential realisation vector, embedded in skewed Time-Space, comparable to the electromagnetic wave that carries the energy for a photon in Einstein's Spacetime.

4. Is Symmetry the Holy Grail of Physics?

It must be realised that symmetry has gradually developed from a useful analytical tool to become an ideology that hardened into dogma. However, the much venerated symmetry is nothing more than an illusion held together by unit substitution and notational bravado.

This illusion reaches its peak in the so-called Wick rotation – a mathematical trick that rotates time into imaginary space:

$$t \rightarrow i\tau.$$

where t is the real-time variable, the perceptive time we usually use to describe physical processes. The term "perceptive time" here refers to the time variable that is dynamically experienced in classical physical settings. It should neither be confused with the imaginary time formalism yielding the Euclidean time τ above, nor with the skewed time axis τ in the 3S+3T framework, where it is a distinct axis operating on event realisation.

This transformation is also applied to turn Minkowski spacetime into space for path integrals, but it merely is a mathematical construct, only serving practical purposes in calculations [11]. Its formalism merely pretends to be insight, the physical nature of time itself is not reflected by it at all [12]. It is interesting to note that Wick himself never published a paper applying his mathematical construction to time.

Throughout the 20th century, the pervasive reliance on symmetry in modern physics has shifted from being an insightful guide to an unquestioned dogma. This aesthetic fallacy has distanced us from the underlying asymmetries that define the true nature of the universe [13]. In the pursuit of elegant, symmetric equations, physics has often neglected the intrinsic asymmetry of time, entropy, and causality, misapplying symmetry as a shortcut to understanding. Theoretical frameworks were not judged by how well they matched reality. Instead, the focus shifted to how beautifully symmetric they appeared on paper [14]. But beauty is not truth. Instead of recognising asymmetries as revealing the structure of reality, physicists of all stripes waffle about forced symmetries. But what can symmetry achieve when the world it describes is manifestly asymmetric?

In quantum mechanics, for example, symmetry-based approaches reveal the limitations of the measurement problem and the phenomenon of quantum decoherence. This problem highlights how an observer's interaction with a system causes a collapse of the wave-function, yet symmetry alone cannot explain why certain outcomes are realised and others are not. Decoherence, on the other hand, describes how quantum super-positions break down into classical states due to environmental interactions, but this process is inherently asymmetric. These phenomena are not merely mathematical artefacts; they point to an intrinsic directionality in the real world, a directionality that symmetry simply cannot explain. It may offer an aesthetically pleasing framework, but it obscures the irreducible realities of quantum systems and the asymmetry of the universe's progression. The pursuit of symmetry for its own sake has led us away from acknowledging the fundamental irregularities of the universe – irregularities that would reveal deeper truths if only we were willing to embrace their complexity.

The most extravagant example of this tendency is certainly supersymmetry – a mathematical fantasy so elegant that its lack of experimental support is treated more like a temporary inconvenience than a fatal flaw [15]:

- Time does not "flow". The mathematical possibility of reversing time is a mirage. Its so-called flow is nothing else than the irreversible transition of realising events passing the gap, and non-events tunnelling into the past cone [2 b].
- Entropy generally increases, but there are pockets in our universe where it decreases [16].
- Observation is not a cause of events, but a process that synchronises our detection with their realisation. It registers which possibilities have become realised, which events tunnelled without realisation – without invoking sudden, inexplicable collapses as in the Copenhagen interpretation.

And yet, physics keeps trying to flatten these directional truths into reversible equations, as if the asymmetry of lived experience were a smudge on an otherwise clean blackboard. Symmetry without correspondence is just theoretical theatre. It performs elegance, not understanding.
The real world is asymmetrical: time has direction, entropy has bias, events are irreversible. And yet, theoretical physics often acts as if these facts are annoyances to be smoothed away, rather than truths to be embraced. True insight does not come from symmetry [17]**.** It comes from understanding why asymmetries exist, how they structure reality, and what they reveal about time, causality, and realisation. In this framework, time is not a mirror of space – as it never was.

5. Why One-Dimensional Time Fails

Since symmetry has become the holy grail in the last century, the notion of a single, linear time axis (1T) – where all events are strictly ordered as "before", "now", and "after" – presents itself as a relic of classical thinking as well [18]. It may function well in simple systems, where causality proceeds sequentially, and where one event triggers the next. But the adoption of one single time axis collapses under its own weight in a universe with memory effects, overlapping simultaneities, and quantum entanglement [19]. Although this is questioned in contemporary physics, allowing for retro-causality – yet this remains mathematical acrobatics without observational support [20].

It must be stated that retro-causality, often proposed in some interpretations of quantum mechanics, is a purely mathematical construct that allows for the reversal of causal order in specific scenarios. Furthermore, any correlation in one-directional time must either be past-caused or future-effected: to line up causality, this approach demands that either one event causes another in the past, or one will affect another event in the future [21]. However, in the presented 3S+3T framework, such concepts do not have any role to play. Causality flows in a strictly directional manner, tied to the event-based realisation of time. The idea of events influencing each other in reverse – effectively, *causing* the past – finds no place in a universe governed by effective, directional time. This model only accepts that causality moves in a single, irreversible direction, shaping the structure of events as they unfold along the axes of space and time.

In four-"dimensional" spacetime, all causality is compressed into a single parameter t – a so-called temporal "dimension" [22]. In practice, this would mean that every event is assigned a unique time coordinate. Given that there could be more events than the estimated 10^{104} quantum-scale events per cubic metre per Planck time unit (PT directionality U), the lining-up of events seems extraordinarily dense for a scalar timeline to accommodate.

As discussed earlier, the asymmetry inherent in the universe is not just an abstract notion, but a real feature that shapes the dynamics of time, entropy, and causality. Unlike the symmetric treatment of time in conventional T1 frameworks, the 3S+3T model embraces the asymmetry of temporal order and event realisation. In this framework, time does not mirror space – it is fundamental to understanding how events unfold, persist, and diverge. The skewed axes of the time and space dimensions – the τ and z axes – *demand* asymmetry, at the same time introducing a natural filtering mechanism for the realisation of events. The event arrow that emerges from this process is structured not by symmetry, but by the fundamental irregularities in the flow of time itself.

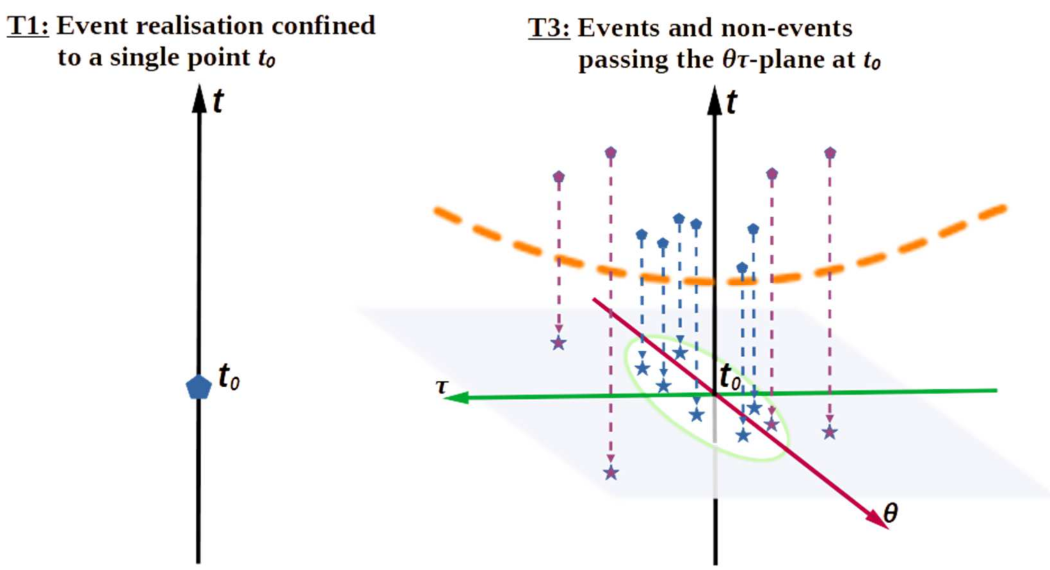

Figure 1. Event Realisation in One-Dimensional *vs*. Three-Directional Time

In standard one-dimensional time (T1, left), only a single event can be realised at a given t_0, compressing causality into a linear axis. The curved, dashed, orange line in the T3 representation above sketches the future cone, the region where all events reside. The structured 3S+3T model on the right – only the Time dimension is shown – distributes potential realisations across the $\theta\tau$-plane, allowing for multiple and simultaneous, but non-linear event realisation. Structured simultaneity replaces scalar snapshots: the resolution of events unfolds across a surface of possibilities, not as a point on a timeline [23].

From this structured realisation of events emerges a natural directionality – an event-based arrow of time. Here, temporal order is not imposed externally but arises from the sequence in which events actualise along t and across θ and τ, providing a geometrically grounded arrow that reconciles branching, simultaneity, and persistence. The following figure depicts its relationship to existing arrows of time:

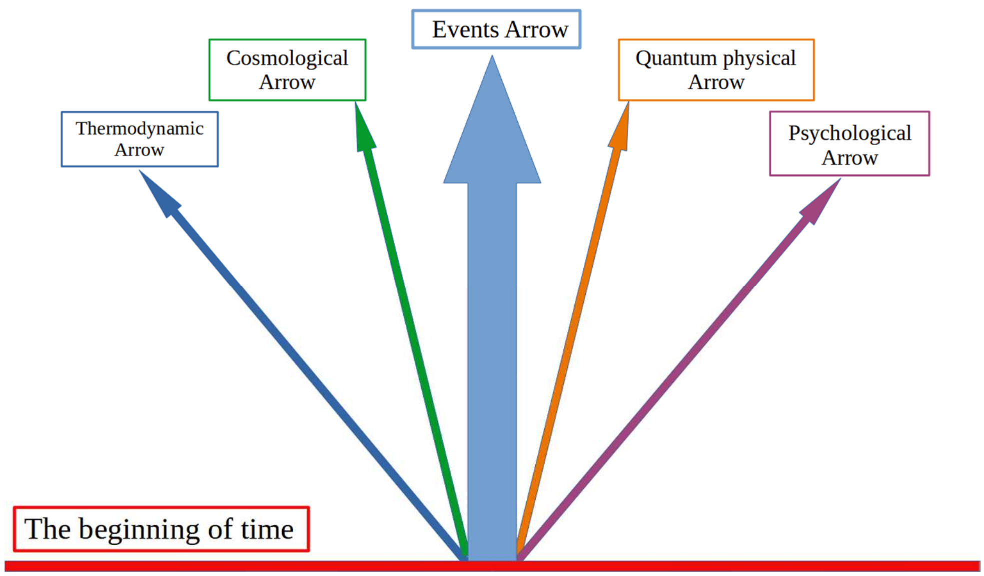

Figure 2. The different Models of the Arrow of Time

In the above figure appears the Event Arrow in blue, the proposed arrow of time based on steadily occurring events, which seem to make time "flow". This arrow is at the base of the proposed 3S+3T model. It resolves the causality bottleneck inherent in 1T, aligning with the skew of τ, and explaining why some events tunnel into the past cone while others are realised – a steady flow defined by the architecture of 3T itself. The Event Arrow underpins the observed alignment of the other arrows of time, providing a unifying geometric basis for their directionality across different domains.

All shown arrows emanate at a presumed "beginning of time". Their divergence shows that all point in a roughly similar "*forward*" direction, yet they are conceptually distinct and measurable in different domains. The thermodynamic arrow is based on entropy observations – it aligns locally with event realisations. This statement is also true for the cosmological arrow which is derived from the large-scale expansion of our universe. Time's causal directionality is explicit in phenomena like tunnelling and entanglement, and constitutes the main argument for the quantum physical arrow. Further, the psychological arrow aligns largely with the perceived flow of events, emergent from the Event Arrow.

A 1T timeline forces all relationships into a binary code: either "A caused B" or "B will cause A." Thus, simultaneity becomes relative, or undefined, indicating that there may be a failure in the

actual time concept [24]. In previous publications, it was outlined that entangled events do not have to be sequenced along t alone: they may be synchronised along θ, and/or connected structurally through τ [25]. This allows for a richer, multidimensional account of causal linkage.
A universe governed by 1T cannot handle branching futures, where one event spawns multiple probabilistic outcomes, which are a natural feature of quantum systems [26]. Neither can a T1 explain entangled correlations, where spatially-separated events share hidden synchrony [27]. Furthermore, simultaneous events cannot be lined up on a single timeline.

Two observers A and B see two events: a flash of light from a mountain, and another one from a high building. For A, situated exactly midway between the light emitting sources, both flashes happen simultaneously. However, for B who is close to the flash emitted by the TV-tower, its flash happens before the other. Yet, A and B see the same events. In a universe with only one time axis, this arises because light travels at finite speed and observers in different positions experience events differently in time. What is "now" for one observer is "not now" for the other. This undermines the notion that simultaneous events can be pinned to a specific moment in a 1T framework.

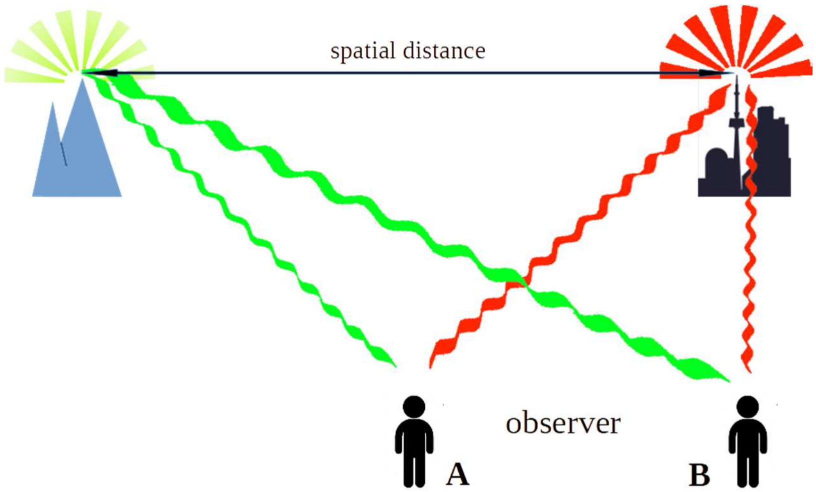

Figure 3. Breakdown of simultaneity in a 1T universe.

A 1T universe must also fail when considering human reliance on memory and experience when making decisions, which in turn shape the unfolding of events [28]. Markov's assumption that only the present matters in determining future states overlooks the critical role of memory and experience in shaping the unfolding of events. In the 3S+3T framework, memory is not defined as an afterthought: it is a structural component of time itself, embedded within the fabric of event realisation. Memory introduces a directional aspect to time, whereby past events inform the present and influence the future. This contradicts Markov's assumption of a memoryless universe, where the future is entirely determined by the present state [29]. In reality, memory shapes our experience of time, anchoring us to a non-linear, non-symmetrical flow of events. This dynamic adds a layer of complexity that the simplistic, linear view of time fails to capture.

To further illustrate the outright insufficiency of a singular time axis, consider again the immense density of quantum-scale events, as mentioned above. The number refers to all localised interactions that meet the minimum structural conditions for potential realisation. These event candidates include fluctuations, wave-function overlaps, and interaction points which could, in principle, become part of the realised causal chain [30]. Within this model, about 10^{24} of these are realised per PTU, while the remaining ~10^{29} directly tunnel into the past cone. This disparity is not arbitrary [2 b]: it arises from the proposed geometry of time, where the τ-skew imposes a directional filtering mechanism, reflecting an inherent asymmetry in the process of realisation – a structural analogue to scale-dependent interaction filtering known in high-energy physics [31].

In a T1 framework, time becomes a bottleneck, constraining complex causal structures into a simplified channel. The result is a physics that either ignores these complexities or patches them with post hoc tricks like decoherence, delayed choice, or statistical renormalisation, none of which reflect the complexity of the world it claims to describe [32].

In a three-directional time-frame, however, these events are not compressed onto one timeline, but distributed on θ as a synchronicity axis as well [33]. This allows that simultaneity is no longer forced onto *t*. Thus, events are co-realised, but not necessarily sequential in *t*, and simultaneity shifts from being a singular point to a structured surface: it is not lost, but liberated.

6. Decomposing Time into functional Axes

Space needs three orthogonal directions to express geometry. Time, governing causality, synchrony, and persistence, must likewise possess three functional axes [34]. These are not metaphors, not aliases. They are real directions in time – each expressing a distinct aspect of temporal structure:

- *t* – chronological, perceptive time, aligned with thermodynamic progression and subjective experience, strictly based on event occurrence.
- θ – synchronicity axis, capturing simultaneity, phase relationships, and distributed coherence across distant systems.
- τ – the skewed persistence axis, responsible for memory, trace decay, and the alignment between potentiality and realised events; it redefines the scalar structure embedded in Minkowski's spacetime construction [35].

This decomposition reclassifies time not as an inert label but as an active, structured manifold through which events emerge, interact, and decay: no constant "flow of time", only the ticking of events that gives rise to this appearance of flow [36].

The flat-but-skewed geometry described in earlier essays places τ at a non-orthogonal tilt to *t* and θ, creating the scaffolding for temporal anisotropy without invoking curved spacetime, at the same time offering an explanation to the observed anisotropies in the CMB and other recently obtained cosmological datasets [37].

The τ axis not only governs persistence but also dictates the decay of memory traces [38]. The decay follows a directional pattern, where the strength of a memory trace diminishes with its spatial distance from the realisation axis. This can be mathematically represented as a function of the radial distance $r^2 = \theta^2 + (\tau - \theta \cdot \tan(\kappa))^2$, indicating that memory decay is intrinsically linked to the geometry of the temporal manifold [1].

To enable the smooth passing of events from the future to the past cone, the apexes of their cones are thought to be separated along the t-axis by ± 1 PTU each from the $x=y=z=t=\theta=\tau=0$ point – the origin in both space and time axes. This represents the smallest possible separation between the apexes in temporal coordinates. Given that realising events pass through a finite area around $t = \theta = \tau = 0$ in the θ-τ plane, a geometrical evaluation of the τ tilt becomes feasible [1]. To preserve a near-to-orthogonal framework, this tilt must remain small. Thus, the specific value presented here – applied similarly to the z-axis of Space for consistency – serves as a provisional fit parameter.

The chosen κ-range reflects a minimal but non-negligible deviation from orthogonality, preserving the quasi-Euclidean character of the 3S+3T framework. Whereas the lower limit ensures that the combined z- and τ-skew effects remain physically meaningful rather than purely mathematical, the upper bound is set by observational constraints. For κ-values larger than about 10^{-3} rad, the predicted asymmetry from the combined τ- and z-skews would imply directional variations exceeding what current observations report. The proposed skew of 0.0054° for z and τ corresponds to $\kappa \approx 10^{-4}$ rad, which actually lies below current experimental bounds on Lorentz invariance violation [13].

However, considerations concerning the chosen reference length and calculations with selected values from the range of κ indicate that the effects on polarisation of the cosmic background radiation may entirely be observable today [14]. Recent analyses used effective quantum-gravity energy-scale measurements to constrain anisotropic Lorentz invariance violation, indicating that κ within the value range as above remain below current empirical limits [16 a, b]. Observations of high-energy gamma-ray bursts provided further stringent bounds on Lorentz violation, reinforcing these limits [17 a, b]. Additional research using GRB time-of-flight measurements and atomic spectroscopy further tighten SME coefficient constraints, reinforcing that the possible κ values remain below actual empirical limits (Penrose, 2010).

In a complementary low-energy test, high-precision Ramsey spectroscopy on trapped ions was employed, and likewise reported no detectable Lorentz-violating effects within their sensitivity [19]. Alternative formulations of Lorentz transformations, such as the vectorial treatment proposed, demonstrate that consistent extensions remain mathematically viable without violating the established tensor framework [20].
An important parameter governing the tilt of the τ and z axes is the skew angle κ. Geometrically, κ quantifies the deviation from perfect orthogonality primarily in the in the temporal manifold, but in Space as well, and can be expressed as:

$$\arctan\frac{2}{21000} \approx 9.524\times10^{-5}\text{ rad} \approx 0.0054°$$

Its value sets the scale for the cumulative directional effects on realising events, while ensuring the framework remains locally near-orthogonal.
Further considerations support a conservative range of κ, within which orthogonality is locally preserved:

$$\kappa \in [0.005°, 0.03°]$$

An even more conservative estimate reduces the viable range of κ to:

$$\kappa \in [0.005°, 0.015°]$$

In the following, only illustrative estimates, explicitly model-dependent, are used. The small-angle linearisation of (xz)/z · ∝ κ/0.0128° gives:

$$\Delta(xz)/z \approx (\kappa / 0.0128°) \cdot (\Delta(xz)/z)_{max}$$

with $\Delta T/T(0.0128°) = 1\times10^{-5}$; $(\Delta(xz)/z)_{max}$ is the predicted fractional deviation at $\kappa = 0.0128°$. Model-based, order-of-magnitude table for the reduced κ range, using a simple linear scaling anchored at an earlier benchmark $\kappa = 0.0128° \rightarrow \Delta T/T \approx 1\times10^{-5}$:

κ (°)	**ΔT/T (CMB temperature anisotropy, est.*)**	**Δz/z (fractional redshift anisotropy, est.)**	**ΔS/S (entropy anisot., est.)**	**Observational detectability**
0.0050	3.9×10^{-6}	3.9×10^{-6}	3.9×10^{-6}	CMB: very small but potentially visible in polarisation stacking; redshift: below single-object precision
0.0100	7.8×10^{-6}	7.8×10^{-6}	7.8×10^{-6}	CMB: measurable in low-ℓ power/hemispherical tests; redshift: requires large statistical samples (Euclid / DESI)
0.0150	1.17×10^{-5}	1.17×10^{-5}	1.17×10^{-5}	CMB: comparable or above low-ℓ anomaly levels; redshift: marginally within reach of stacked analyses; local tests unchanged

Table 1. Estimated CMB, redshift, and entropy anisotropies for selected κ-values in the 3S+3T model (*meaning estimated)

Local orthogonality remains effectively preserved throughout the applied range; listed signals are cumulative line-of-sight effects, detectable primarily by CMB low-ℓ analyses or statistical redshift stacking, not by single-object spectroscopy [38].

Assuming the skew κ in the temporal manifold slightly perturbs the path length of photons along different directions, one can *estimate* an order-of-magnitude redshift anisotropy. Postulating $\Delta z/z \propto \kappa$ in a small-angle approximation, one can scale linearly:

$\kappa = 0.0054° \rightarrow \kappa \approx 9.42\times10^{-5}$ rad $\rightarrow \Delta z/z \approx 10^{-5} \times$ *factor* (depending on normalization), and $\kappa = 0.0077° \rightarrow \kappa \approx 1.34\times10^{-4}$ rad $\rightarrow \Delta z/z \approx$ slightly larger.

The exact factor depends on the normalisation of the skew-to-redshift map, e.g., how one integrates along line-of-sight in the 3S+3T framework.

In contrast to conventional probabilistic models, the selection of realised events in this framework is not a random occurrence, but rather a structural function rooted in the geometry of time itself. This guarantees an asymmetry in the realisation process, as opposed to the seemingly symmetrical setup in conventional models where entropy governs the flow. Once time is decomposed into t, θ, and τ, several apparent paradoxes in conventional physics become geometrically natural:

- Temporal anisotropy does not originate in thermodynamic laws, but in the directional skew of τ – the axis along which realised and non-realised events are structurally separated,
- Realisation filtering – the selection of which events become "real" – is no longer probabilistic guesswork, but a geometric constraint of what can pass the gap,
- Concerning Entanglement: the famous Einstein 'Spukhafte Fernwirkung' is still misunderstood as "non-local weirdness", but this model offers a structural explanation: correlations are embedded in the $\theta\tau$-plane [2 b].
- Memory decays not arbitrarily, but spatially across τ – a fading of trace strength that respects geometric distance from the realisation axis.
- Irreversibility is not merely statistical: it is embedded in the topology of event passage, asymmetry is built into architecture. Events transition from the future to the past cone through a transition window (gap), a process influenced by the orientation of τ. This gap acts as a selective gateway, allowing certain events to become realised while others bypass this mechanism and tunnel directly into the past cone – in a structural sense rather than literal quantum tunnelling [34]. This structural feature accounts for the high ratio of non-realised to realised events and reinforces the model's explanation of temporal asymmetry.

Events transition from the future to the past cone through a narrow realisation window, a process influenced by the orientation of τ, or bypass it entirely via tunnelling. In the idealised schematic (figure 2), the τ-axis, serving as the asymptote of the hyperbolae, is omitted for visual clarity.

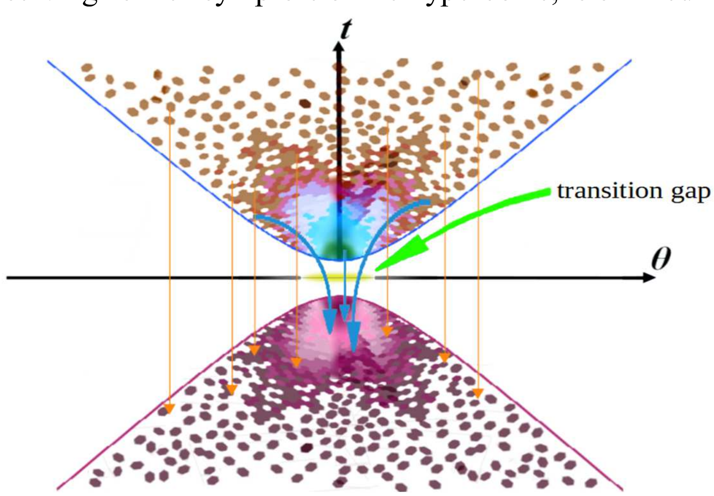

Figure 4. Temporal cone structure with realising and non-realised events.

The blue arrows represent realising events that pass through the narrow transition gap, entering the past cone via geometric filtering. Straight orange arrows depict non-events that bypass the gap and tunnel directly from the future cone into the past cone without being realised. The density contrast visualises the ratio of realised to non-realised events per Planck time unit [39]. The transition gap acts as a selective gateway, filtering potential events. This structural asymmetry accounts for the overwhelming prevalence of non-events and reinforces the model's explanation of causal directionality, allowing for a the reinterpretation of the arrow of time, as described in former work.

7. The Architecture of 3S+3T

In post-Einstein physics the term *"geometry of spacetime"* immediately evokes the picture of gravity bending paths, that geodesics bend, meaning that the couple mass-energy distorts metric, and that a flat universe is boring. One does not need curvature to have a meaningful, rich geometry. Not the warping of distances is essential, but the arrangement of the framing axes and their interrelations.

In a previously presented model, Space is flat, and Time is structured through skew, and not through Ricci tensors [40]. The described hyperbolic cones are not static Minkowski constructs at a 45° angle, but opened nearly to flatness. What is more, future and past cones interact: events pass from the future cone into the past cone, subject to a filtering mechanism, itself influenced by the τ-tilt – a feature established as correlating with cosmological anisotropy [41]. The skew of τ is captured by the parameter κ, representing the angular deviation from orthogonality [2 b]. All that is the result of axis orientation, not metric distortion [33]:

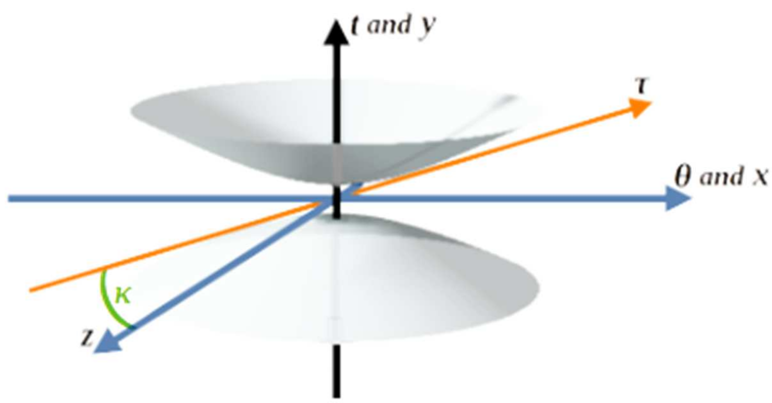

Figure 5. Space and time superposed.

In a recent publication **[42]**, also Space is no longer orthogonal: the introduced skew of the z-axis reinforces the anisotropic effect. Geometry has long been mistaken for curvature, Time for a coordinate. But neither of these labels captures the structure needed to describe how events are realised, how we should interpret the "flow of time" [13]. In this framework, spacetime is not curved – the result is directional asymmetry without invoking gravity wells or imaginary constructs. In contrast to Einstein's geometric model of gravity, here, gravity is not a force in the traditional sense, but an emergent statistical tendency driven by the asymmetry in time's and space's geometry. The skews along τ and z must be understood as influencing the likelihood of event pathways being realised, which result in the observed 'attraction' associated with massive objects.

The 3S+3T model operates in six directions: three spatial (x, y, z) and three temporal (t, θ, τ). The static spatial set localises position, whereas the dynamic temporal set governs event order, synchrony, and persistence. These are not symbolic placeholders – they are distinct directions in time. In this view, time is not a container – it is a structure that selects [42]**.** It differentiates. It filters. It remembers. And its skew, especially along τ, defines the entire directional logic of the universe.

Space and time are not orthogonal compartments but intrinsically aligned; we move through both simultaneously. If space must be three-dimensional to express geometry, then time must be three-dimensional to express causality [43]**.** That includes not just what happens, but why, when, and with what trace.

8. Gravity as Emergent Event Flow – an Outlook

An attempted integration of gravity into this framework must reconceive it not as curvature of spacetime, but as an emergent effect arising from structured event flows [44, 36].
Masses act as anchors on the lattice, not creators of curvature. Their positions define local '*event highways*': the tiny τ- and z-skews merely guide events that become more likely to realise, at the same time enhancing their probability of realisation. This gives a structural hint on gravity – not as a force bending spacetime, but as a directional bias in how events unfold around massive bodies. Thus, event realisation is steered, and probabilities are channelled. Mass guides the event flow, but neither bends space nor accelerates or slows down time.

The cumulative guidance reproduces familiar gravitational behaviour without invoking curvature. In this view, forces are not fundamental, but emerge from the geometric orientation of the temporal and spatial manifolds, linking causal flow to mass-energy distributions [36]. Gravitational attraction becomes a statistical tendency for events to converge along paths reinforced by the skewed geometry, rather than an intrinsic property of spacetime itself [38].

Thus, in this model, gravity emerges from the structured flow of events rather than bending spacetime. By recasting gravity as an emergent bias in event evolution, the usual conflict between general relativity and quantum mechanics is bypassed: discrete, directional probabilities coexist with gravitational effects guided by the geometry [38]. This perspective opens a pathway toward integrating gravity into a unified, event-based framework, without forcing curvature into a fundamentally probabilistic universe [39].

The challenge of unifying gravity with quantum mechanics – and by extension any grand unifying theory – is well-known [45]. Continuous curved spacetime clashes with discrete, probabilistic quantum events, and conventional curvature-based approaches are non-renormalisable [39, 32, 13]. This model sidesteps the conflict by embedding directional bias and event flow into the manifold itself, offering a route to reconcile causal structure, event realisation, and gravitational effects.

Locally, the model mirrors Newtonian dynamics, cosmologically however, the skew-induced guidance could embed gravity within the architecture of realised events. While a full formalisation of gravitational dynamics in three-directional time is future work, this approach hints at a unifying explanation for causal flow, event realisation, and force-like interactions in a subtly anisotropic manifold.

9. Conclusion

This essay has outlined a fundamental restructuring of time – not as a scalar, not as a fourth dimension, but as a three-directional framework embedded in a nearly flat geometry. In Section 2 was demonstrated the failure of one-dimensional time to account for branching, synchrony, and memory. Its inadequacy is not merely conceptual, but structural: it struggles to account for the causal density of complex systems. In contrast, the 3S+3T framework remains fully compatible with established observations, including thermodynamic behaviour, cosmological expansion, and the constraints of relativistic physics.

Sections 3 and 4 introduced the decomposition of time into three axes: t (chronological order), θ (synchrony and distributed simultaneity), and τ (persistence and realisation). These axes are not theoretical conveniences. They are required to describe the full geometry of causality, memory decay, and asymmetry. Filtering, entanglement, and irreversibility are no longer mysteries – they are geometric outcomes of a skewed but near-to-flat temporal manifold. From this structured realisation of events emerges a natural directionality – an event-based arrow of time. It arises from the sequence in which events actualise along t, θ, and τ, underpinning causal flow, branching, and simultaneity, and aligning conceptually with thermodynamic, cosmological, and psychological arrows.

Section 5 reinforced the superposition of the 3T framework into a 3S+3T architecture: six orthogonal directions, three spatial and three temporal, with τ and z as the skewed backbones of realisation. In this setting, gravity is not curvature, but a directional influence on the orientation of τ and z. Event cones are not static Minkowski relics, but dynamic structures shaped by filtering and trace decay. The geometry remains locally flat, and a comparison of the range of κ induced skews, i.e., the shifts in τ-z orientation driven by κ with recently observed cosmical anisotropies, including those recently found in the cosmic microwave background, could yield satisfactory explanations for their existence. Also, apparent paradoxes in simultaneity and in the arrows of time could be structurally accounted for.

No new metaphysics is invoked. Nothing is invented – time *always* had its three directions. The proposed structure is minimal, the consequences are not. Future work will formalise gravitational dynamics in three-directional time and explore its potential for unifying quantum and classical frameworks, and establish quantitative predictions to test the proposed architecture against observational data. Beyond theory, this restructuring provides a clearer conceptual language, helping to avoid persistent misconceptions and guiding a more precise understanding of temporal reality. Potential applications in modelling entanglement, quantum processes, and cosmological phenomena may offer additional support for a 3S+3T universe.

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