Time as Substance: Causality and the Arrow of Time in FOT

From dST = 0 to the Direction of Becoming

Author: Stephen Daubney · The Daubney Foundation · thedaubneyfoundation@gmail.com · 2026 · P-TCAUS-1 to P-TCAUS-6

Abstract

The philosophy of time is dominated by two puzzles: why does time have a direction (the "arrow of time") when the fundamental laws of physics are time-symmetric, and what grounds causality? The Force of Time (FOT) resolves both by treating time not as a background dimension but as the flowing substance Tau whose conservation law dST = 0 is itself the source of temporal asymmetry and causal order.

P-TCAUS-1 · Time Is Not a Container

The standard picture treats time as a background container through which events occur. Newton's absolute time flows uniformly regardless of what happens within it. Relativity makes time elastic but still treats it as a dimension, not a substance.

P-TCAUS-1	In FOT, time IS the substance. Tau does not flow through time; Tau IS the flow. There is no background clock ticking behind physical events — the events ARE the Tau-flow. Remove all matter and you remove all time.

This dissolves McTaggart's A-series/B-series paradox. The A-series (past/present/future) is the local experience of Tau-flow from a particular Tau-address. The B-series (earlier/later) is the global ordering of Tau-addresses in the standing wave. Both are real aspects of Tau.

P-TCAUS-2 · The Arrow of Time from dST = 0

Standard physics derives the arrow of time from entropy increase (the second law of thermodynamics). But why entropy increases is a deep mystery; the microscopic laws are time-symmetric.

P-TCAUS-2	The arrow of time in FOT is not statistical but structural: Tau-flow has a preferred direction because the standing wave is helical. A helix has a handedness — it winds in one direction only. The arrow of time is the arrow of the helical winding of Tau.

Entropy increase is a consequence, not a cause. As Tau flows along its helical path, configurations become more distributed — entropy is the measure of Tau-dispersal, not the source of time's direction. This makes the arrow of time a geometric necessity, not a statistical accident.

P-TCAUS-3 · Causality as Tau-Address Ordering

Causality is usually defined as a relation between events: A causes B if A is a sufficient condition for B and A precedes B. But what grounds the "precedes" relation?

P-TCAUS-3	In FOT, causal order is Tau-address order. A precedes B if and only if A's Tau-address lies earlier in the helical standing wave than B's. Causation is not a primitive relation imposed on events; it is derived from the geometry of the wave.

This explains why causation cannot run backwards: the helix does not reverse. It also explains the asymmetry between cause and effect without invoking counterfactuals or probability theory — the asymmetry is built into the Tau geometry.

P-TCAUS-4 · The Present Moment and the Wave-Front

What is "now"? Standard physics has no privileged present; all times are equally real (the "block universe"). Presentism insists only the present exists. FOT navigates between these.

P-TCAUS-4	The present is the local Tau wave-front at a given Tau-address. It is not a global simultaneity but a local leading edge of Tau-flow. The block universe is the global view of the standing wave; the present is the local view from within it.

Both perspectives are valid. From outside (sub specie aeternitatis), all Tau-addresses exist in the wave structure — the block universe. From inside (sub specie temporis), the wave-front moves forward — the living present. FOT unifies these without contradiction.

P-TCAUS-5 · Time Travel and Tau-Conservation

Could one move to a different Tau-address in the past? FOT gives a precise answer.

P-TCAUS-5	Time travel to the past would require reducing the local Tau-address without reducing the global standing wave. This violates dST = 0: you cannot subtract Tau-flow from the present without adding it elsewhere. Past-directed time travel is forbidden by Tau-conservation.

Future-directed travel (moving forward faster than the ambient Tau-rate) is not forbidden — it corresponds to Tau-flow acceleration at a local address. This is consistent with relativistic time dilation reinterpreted in Tau terms.

P-TCAUS-6 · Eternalism, Presentism, and Tau-Realism

FOT's position on the ontology of time is Tau-realism: past and future Tau-addresses exist in the standing wave structure, but only the present wave-front is causally active.

P-TCAUS-6	Past Tau-addresses are encoded in the standing wave as phase information. They are real but causally inert — they cannot be changed because Tau-flow is one-directional. Future addresses are determined in structure but open in their Tau-indeterminacy at branch points.

This gives FOT a unique temporal ontology: more than presentism (the past is encoded, not erased), less than strong eternalism (the future has structural but not fully determinate reality). Tau-realism is the ontology that fits the conservation law.