

WaveTree

A history-conditioned geometric framework in which matter, dark matter, and dark energy are three regimes of one substrate — with one specific, falsifiable residual prediction, and the strongest objections stated by the authors themselves.

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Version 1.0, July 2026 · [Full treatise](#) >

CENTRAL THESIS — STP (SPACETIME-PAST) DOMINANCE

Historical spacetime is the substrate of reality. What Λ CDM distinguishes as ordinary matter ($\sim 5\%$), dark matter ($\sim 27\%$), and dark energy ($\sim 68\%$) are three regimes of one history field $\mathcal{H}$ — a functional over the causal past of each spacetime point — distinguished by the coherence with which $\mathcal{H}$ has been written onto the advancing present. The Now is a spacelike Cauchy surface whose conditioning by its own past spreads at c ; gravity, inertia, and the classical–quantum boundary receive geometric readings within the same picture, each consistent by construction with GR, the SM, and Λ CDM.

1 Three regimes of one substrate

$\sim 5\%$

COHERENT-MODE $\mathcal{H}$

History written into localized, records-making structures on the Now: carries conserved charges, couples through the Standard Model.

$\equiv$ *baryonic matter*

$\sim 27\%$

TEXTURED-MODE $\mathcal{H}$

The correlations of the causal past — clumping, halo-forming, gravitationally active — not yet written into records. $w \approx 0$.

$\equiv$ *dark matter*

$\sim 68\%$

SMOOTH-MODE $\mathcal{H}$

The substrate's ensemble mean $\langle \mathcal{H} \rangle$: spatially and temporally smooth. $w \approx -1$, with a stated fork on evolving w that DESI-era data will decide.

$\equiv$ *dark energy*

2 The falsifiable prediction — stated as a residual

P3 — HISTORY-LINKED HALO RESIDUALS BEYOND ASSEMBLY BIAS

Λ CDM already predicts halo–history correlations through assembly bias (concentration tracks formation epoch), so a bare age–profile correlation is not news — and the treatise says so. The WaveTree prediction: *after* the simulated Λ CDM expectation (assembly bias + baryonic feedback, with stellar M/L systematics forward-modeled) is subtracted, a *positive residual correlation* between halo lensing profiles and stellar-population history proxies remains. Λ CDM predicts the residual vanishes. Testable at DESI Y5 / Euclid / LSST stacked precision; the treatise specifies the pipeline, including the closure test on pure Λ CDM mocks. A convincing null strips the framework to an interpretive reading with no independent empirical content — a consequence the treatise accepts in print.

3 The objections are part of the document

STATED AND ANSWERED UP FRONT

"A universal Now is an ether" (answer: the CMB comoving frame, given dynamical significance only at cosmological scale; local Lorentz invariance exact). "Expansion is a rate, not a velocity" (answer: what spreads at c is the causal conditioning of each slice by the last — the growth of the domain of dependence).

CONCEDED, AND REPAIRED IN PRINT

"History-dependent inertia violates equivalence-principle tests" — correct; the framework now forbids it (drag fixed by invariant content alone; MICROSCOPE, ALPHA-g). "The N-particle wave function lives in configuration space" — conceded; the identification is claimed only for single excitations and decohered records. The claim-audit appendix carries explicit **red rows**: readings the framework itself excludes.

4 Where it sits in the literature

The treatise places itself explicitly against its neighbors: the growing block of Broad and **Ellis** (the past as real and accumulating — WaveTree makes it dynamical); **Mach's principle** rotated into time (inertia from a body's own causal past); **Smolin's** principle of precedence (law from accumulated history); **Deser–Woodard** non-local gravity (causal-past functionals on the RHS of Einstein's equations); **Verlinde's** emergent gravity (dark phenomena as substrate memory — the closest published cousin); **Wheeler–Feynman** and Feynman–

Stueckelberg (advanced–retarded structure; antimatter as historic spacetime pulled forward); and the computational-substrate programs of **Wolfram and 't Hooft** (the author is a computer scientist; the substrate instinct is acknowledged as native). It is disciplined where the literature bites: **MOND's radial acceleration relation** already bounds the rotation-curve arm of P3, which is why lensing is primary.

5 What is asked of the reader

1. Read the anticipated-objections section first (Section iii) — it was written to save you time, and two of its entries record errors made and corrected during drafting.
2. Assess whether P3, as specified (Section 6 + Appendix C, with the assembly-bias subtraction and closure test), is well-posed against DESI/Euclid/LSST data.
3. Judge whether the composition — one substrate, three regimes, history as source — merits further formal work (the treatise names its own open problems, including the missing Lagrangian and the descriptive taxonomy).

The author is a layperson; the treatise was prepared in collaboration with an AI system acting as subject-matter translator, and it says so on its face. Criticism is the purpose of circulation.

Full treatise — <https://claude.ai/code/artifact/50b29e8f-fecd-4818-abd8-788b74d98a78>

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