A NEW ‘STACKUP’ MODEL OF GRAVITATION AND THE COSMOS:

EXPLAINING DARK-SECTOR MECHANICS FROM FOUNDATIONAL GEOMETRIC PRINCIPLES

In the grand theater of the universe, roughly 95% of the cast remains hidden from view. Astronomers and physicists call these mysterious actors **dark matter** and **dark energy**. Dark matter provides the unseen gravitational scaffolding that holds galaxies together, while dark energy drives the accelerating expansion of the universe itself. The prevailing view is that these are new, undiscovered forms of matter and energy: a mysterious force (or forces) that does not interact with light and therefore cannot be directly measured.

Such a perspective requires quite a bit of *assumption*; and those assumptions have only grown in relative size and importance as our measurements of the cosmos have become ever-more precise. A sceptical sort may worry at this: what if dark energy and dark matter aren't *things* at all?

A new framework, assembled and forwarded by a loose confederacy of thinker (and at fore, by project founders C.B. Cyrek and Derek Burkeen), and further enabled through novel (and rigorous, non-hallucinatory) uses of LLM AI, suggests that these cosmic mysteries are not ingredients to be found, but rather a profound feature of spacetime's geometry that we have yet to fully appreciate. Instead of adding to the cosmic inventory, the theory re-engineers our understanding of gravity itself. This is accomplished by assembling a "theoretic stackup" of three powerful ideas from the frontiers of physics.

THE THEORETIC STACKUP

Imagine the development of an F1 engine, under new technical regulations. (As occurs within the world’s premier racing league every 4-5 years.) The competing teams would be remiss to start from scratch with each iteration! Rather, these teams proceed by

ingeniously combining the most advanced components and proven engineering from previous makes and models, going all the way back to the inventions of the combustion and electric engines!

In a similar mode, the Complexity Committee draws from three landmark (and peer-reviewed) proposals, assembling them in a novel way, and meeting the resulting challenges as they arise. But in place of hydrocarbon combustion and electric propulsion, the assembled theory in this case draws on *gravitation* and *information holography.*

TWIN SPACETIME (BIMETRIC GRAVITATION): *BIMETRIC (DUAL-SHEET) THEORIES*

Bimetric theories propose that our universe is not alone; it exists in parallel with a second, interacting spacetime. Picture two vast trampolines side-by-side; a heavy weight on one not only creates a dip but also tugs on the fabric of its neighbor. The great achievement of S. F. Hassan and R. A. Rosen was discovering the precise mathematical rules for this interaction that prevent the theory from collapsing into absurdity—a notorious problem known as the "Boulware-Deser ghost".

ORIGINS OF THE 'DUAL METRIC' MODEL:

The concept of a mirror universe is not new, and the framework builds upon a rich intellectual heritage. It starts with Andrei Sakharov's "twin-universe" cosmology, which proposed a CPT-symmetric partner to our own—a universe reflected in charge, spatial orientation, and the arrow of time. (Notably, Sakharov created his model as a rejection of the emerging Western consensus.) His idea was later refined by Jean-Pierre Petit and Jean-Marie Souriau into the "Janus Cosmological Model," giving the twin sheets a more formal geometric role in generating cosmic dynamics. The BT8G framework grounds this legacy in a rigorous, modern context by identifying these twin universes with the two interacting spacetimes of a ghost-free Hassan-Rosen bimetric theory.

TETRADIC TORSION: TELEPARALLEL GRAVITY

The second component of our alternative gravitation stack is derived from classical **teleparallelism**. First explored by Einstein himself, it has been recently recast as a modern "gauge theory" by M. Partanen and J. Tulkki. Instead of describing gravity as the *curvature* of spacetime (the dip in the trampoline), it describes it as the *torsion* or "twist" of spacetime's fabric. Imagine a stack of perfectly flat glass plates (the geometric tetrads characterized by Einstein) that are slightly rotated relative to one another; the overall structure has a twist, even though each individual pane is flat. It's a different language for the same force, but one that offers powerful new mathematical tools for tackling quantum problems.

EINSTEIN'S UNFINISHED SYMPHONY

The theory's use of teleparallelism revives one of Einstein's own research programs, which he called "distant parallelism" (*Fernparallelismus*). He hoped this "torsion" approach would provide the key to unifying gravity and electromagnetism. However, he ultimately abandoned it, in part because it did not solve the **singularity problem**—the cosmic dead-end where the mathematics of his theory breaks down into infinities at the center of black holes. (e.g. the Schwarzchild radius, et all)

The BT8G framework offers a potential solution. By introducing a second, conjugate spacetime, it provides a "geometric scaffolding". The repulsive nature of the interaction can prevent a complete gravitational collapse to an infinite point, potentially resolving the very issue that stymied Einstein.

The authors of this integrated proposal believe Einstein almost certainly would never have abandoned his Teleparallel approach if only it had been developed *after* the introduction of bimetric field theories.

CONFORMANCE TO GENERAL RELATIVITY

Critically, this twin lineage – the *conceptual work* of making teleparallelism work within a bimetric manifold – ensures the resulting framework produces identical to General Relativity within the observed spectra (that is, GR results that have been observed and validated are also predicted in an identical manner under the combined 'Tetradic Autoparallel' assembly). Where they diverge directly addresses the unresolved arguments left by GR: supernovae lensing and distribution, galactic rotation, and dark-sector mass/energy.

BOUNDARY IS EVERYTHING: *HOLOGRAPHIC PRINCIPLES*

The final component of our stack is the **holographic principle**, (via Gerard 't Hooft, Leonard Susskind, and Raphael Bousso, among others): an increasingly-popular concept suggesting that all the information in a volume of space (like a room) can be described by physics happening on its boundary (the walls). Just as a 3D holographic image is fully encoded on a 2D film, this principle allows physicists to relate a higher-dimensional reality to a lower-dimensional description, providing a powerful tool for information management.

FIFTH-DIMENSIONAL HALO REGULATOR

To regulate the complex informational interaction required for the bimetric+teleparallel model, the framework introduces a **5D Kaluza-Klein 'halo'**—a tiny, curled-up fifth dimension that surrounds the 4D bimetric universe. (This is the only bit of string theory that is used anywhere, *we swear!*) This halo acts like a sophisticated filter, absorbing problematic high-energy quantum effects.

THE BIMETRIC HOLOGRAPHY ENGINE

From a mechanistic standpoint, the work relies on two conceptual "Pipelines":

A: consisting of the kinematic/geometry mechanics, and
B: consisting of topological characterizations

When fully assembled, (alongside a few other components we will gloss over here), these 'bimetric' Pipelines function as a **'Holography Engine',** by taking regulated information from the 5D halo (the "film reel", or to use technical terms, *'bulk invariance'*) and projecting that onto the 4D boundary between the two spacetimes (the "screen", or *'boundary conditions'*). This holographic projection is what creates the physical reality we observe. The result of this entire process, integrating bimetric gravity into a teleparallel framework, is a theory of **Autoparallel Gravitation**, which is then promoted via this projection engine into a complete **Autoparallel Holography**.

TAMING THE QUANTUM GHOST

A major hurdle for many modified gravity theories is the "ghost problem," (*or 'ghost infinity',* or *'massive graviton')*: *an* instability that emerges when trying to give the graviton (the particle of gravity) a mass. The Hassan-Rosen potential solves this problem at the classical level (through the use of a mass-carrying graviton that self-interacts with a massless 'ghost' graviton). However, such a delicate construction simply does not work in the quantum world.

PARTANEN & TULKKI'S FOUR-GAUGE 'FLAT-SPACE'

This is where the **Partanen & Tulkki Four-Gauge proposal** comes into play. Their formulation of teleparallel gravity is believed to be quantum-consistent at one-loop, (as verified by David A. Prince's VIECAF-C analysis avoiding the infinities that plague other theories. BT8G then performs a novel extension: it applies this 4-gauge structure to *both* bimetric sheets, creating a doubled "**Octo-Gauge**" architecture. (The authors take care to distinguish this from Partanen & Tulkki's more recent '8-spinor' discrete gravity-term extension, as used in their developing Unified Gravitation proposal).

DIAGONALIZING ENERGY

This unique construction is what facilitates the special interaction between the sheets, turning two stable theories into one unified, holographic system. As a result of this careful assembly, problems specific to energy output resulting from the bimetric interface (through a process called 'diagonalization') are explainable by a minimal energy-transfer operation – a phase-floated 'Jordan' lock – that makes the model irreducibly compatible with observed effects within the laboratory and orbital scales.

FROM THEORY TO REALITY: *TESTABLE PREDICTIONS*

This story, of geometry living in twin planes, doesn't exist in a purely mathematical realm. It makes concrete, falsifiable predictions.

COSMIC CLUSTERING

The theory predicts that the rate at which galaxies cluster is slower than in the standard model, yielding a specific "growth index" of

$$\gamma_{\mathrm{BT8g}} = 0.420 \pm 0.008.$$

This stands in sharp contrast to the standard prediction ($\gamma_{\Lambda\mathrm{CDM}} \approx 0.545$) and is testable by observatories like DESI.

- The authors are happy to report that initial analysis of DESI's DR1 archive appear to produce a growth index of 0.425 – inline with the second-order error window. Findings will be published for peer-review in the forthcoming 'Bimetric Teleparallel 8-Gauge Holography' whitepaper.

INFLATIONARY STELLAR COMPLEXITY

Paired to the predicted 'cosmic clustering' is the prediction that early stellar observations (or those observations made 'farther back in time') will demonstrate galactic complexity of an order greater than that predicted under ΛCDM; meaning, we would expect to see *significantly* more complex spiral-type and bar-type galaxy formation in a bimetric universe.

- The authors are again happy to report early findings from JWST deep-time field observations *appear to show precisely this.*

SPIN-VECTOR LAB EXPERIMENTAL DESIGN

A meticulously designed **twin-pendulum experiment** could detect a tiny, differential twist caused by the two spacetimes' influence on spinning matter—a mechanism called "spin-vectorization". *(pending approved funding via Spectrality Institute)*

LENSING THROUGH COSMIC VOIDS

The theory makes the unexpected prediction that vast, empty regions of space should bend light *away* from them, an effect of **negative convergence** that is the opposite of normal gravitational lensing.

- The authors anticipate a fully-funded LIGO observatory should provide sufficient resolution to prove/disprove the hypothesis.

A GHOST-FREE UNIVERSE, LIBERATED FROM THE DARK-SECTOR

Of primary importance, as far as predictions go, is the proposed characterization of a cosmological framework free of dark energy and dark matter.

Bimetric Teleparallel 8-Gauge Holography (or, more succinctly, 'Autoparallel Holography'), resolves reliance on a dark sector by reinterpreting dark matter and dark energy as the observable consequences of a geometric interaction between two parallel spacetimes, or "sheets". This is achieved through a specific bimetric condition known as **antisymmetric coupling**.

THE CORE MECHANISM: *GEOMETRIC CONJUGATION*

The central idea is that the two spacetimes do not interact arbitrarily. Their connection is governed by a strictly **antisymmetric coupling** at their shared boundary.

This specific type of coupling enforces a "geometric conjugation" between the two sheets. This means that the stress-energy on the "negative" sheet is effectively a CPT-inverted, mirror image of the stress-energy on our own "positive" sheet. The framework formalizes this relationship at the level of torsion (T) and then stress-energy $(T_{\mu\nu})$:

- $T^{(-)} = -\mathcal{C}T^{(+)}\mathcal{C}^{-1}$
- $T^{(-)}_{\mu\nu} = -\mathcal{C}T^{(+)}_{\mu\nu}\mathcal{C}^{-1}$

These *"'negative-mass' dynamics are not an added hypothesis but the mathematical entailment of antisymmetric inter-sheet coupling".* This single mechanism then produces effects that precisely result in the observations (Hubble Tension, galactic rotation and acceleration, et al) that is presumptively interpreted to be the work of unobserved 'dark energy' and 'dark matter'.

THE RESULTS: *EXPLAINING OBSERVATIONS OF 'DARK ENERGY' AND 'DARK MATTER'*

1. **Geometric Acceleration (Dark Energy):** The accelerated expansion of the universe arises from a "dilution asymmetry". As the universe expands, the effective negative energy of the conjugate sector dilutes more slowly than the positive energy and matter in our own sector. This growing imbalance creates a gentle, persistent repulsive force at cosmic scales, driving the late-time acceleration that we currently attribute to dark energy.

1. **Geometric Scaffolding (Dark Matter):** The extra gravity needed to hold galaxies together is explained as "geometric mass enhancement". The conjugate sector provides an invisible "geometric scaffold" that adds to the total gravitational potential. The total effective mass felt by stars in a galaxy

becomes the sum of the visible mass on our sheet and the absolute value of the mass from the conjugate sheet $\left(M_{eff}(r) = M_{(+)}(r) + \left|M_{(-)}(r)\right|\right)$.This naturally produces the flattened galaxy rotation curves without requiring any new, undiscovered particles.

CONCLUDING

In summary, this proposal presents a complete and self-consistent theoretical framework that replaces the "dark sector" of cosmology with a richer, more empirically-grounded gravitational geometry.

The Spectrality Institute, and the assembled members of Complexity Committee, forward this proposal as a preferential alternative to the dominant regime, on grounds that it provides discrete and immediate falsifiable hypotheses.

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