

The Cosmic Tension Pulse Theory (White Paper)

Subtitle:

A Tensional Continuum Unifying Structure, Energy, and Matter

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Abstract:

This paper presents a unified cosmological framework grounded in the dynamics of spatial tension, offering an alternative to particle-centric and dark-matter-dependent models. It introduces a fundamental identity — *space = matter + wave* — wherein matter is defined as a localized expression of spatial compression, and light as the propagating wavefront of tension transformation.

Matter and antimatter are reinterpreted not as annihilative opposites but as inverse tension states; their transitions are structural reversals mediated by light, not particle destruction. Black holes and main-sequence stars are shown to be cyclic extremes of this process, functioning as sinks and sources of spatial tension, respectively.

The model further extends to atomic behavior, nuclear reactions, and macroscopic thermodynamic effects such as thermal expansion, unifying them through tension state variation. This theory asserts that all energy phenomena — from stellar radiation to quantum transitions — are expressions of a single, continuous, and self-modulating field of spatial tension.

The result is a non-anthropocentric, annihilation-free cosmological vision that closes long-standing theoretical gaps without invoking unverifiable constructs such as dark matter or vacuum fluctuations.

Introduction · Observing the Universe Through Tension

Over the past century, humanity's understanding of the universe has relied heavily on a paradigm of “particle dominance within a gravitational framework.”

While this model has explained many observed phenomena, it still leaves numerous paradoxes unresolved, including:

- Why stars continuously emit light;
- Why black holes seem to destroy information;
- Why galaxies rotate faster at their edges than predicted;
- Why the universe is accelerating in its expansion.

To reconcile these contradictions, the scientific community has introduced patchwork concepts such as “dark matter,” “dark energy,” and “particle annihilation.”

Yet these constructs have not been directly observed and increasingly depend on mathematical fixes and theoretical scaffolding.

This theory offers another path:

To view the universe as a system governed primarily by the behavior of **spatial tension**.

Particles are not fundamental entities, but structured expressions of space;

and all manifestations of energy, light, and matter transformation are ultimately expressions of spatial tension in motion.

Chapter 1: The Fundamental Relationship Between Spatial Tension and Matter Structure

Traditional physics treats space as a passive backdrop and matter as the active protagonist.

Yet this distinction fails to explain why “emptiness” itself exhibits behaviors such as expansion, curvature, and the transfer of energy.

This theory proposes that **space itself possesses both structure and behavior**, and that its fundamental building block is **tension**—a primal field that determines matter states, energetic expression, and structural evolution.

We propose a foundational formula:

Space = Matter + Wave

Under this definition:

- “Matter” is the result of spatial tension being locally concentrated—a stable node formed by constrained tension;
- “Wave” is the propagation pattern formed when tension is released or

redistributed—manifesting as light, sound, radiation, and all wave phenomena;

- “Energy” is no longer an independent substance, but the transitional expression of changing tension states.

Thus, the universe is no longer "particles filling space," but rather "tension shaping particles."

Matter becomes a structural mirage of tension, and energy its transformational language.

Chapter 2: The Spatial Behavior Symmetry Between Matter and Antimatter

In conventional models, matter and antimatter are defined as "opposites" that annihilate each other upon contact.

Yet this framework suffers from conceptual discontinuities and cannot explain why antimatter is so rarely found in nature, why annihilation produces light, or why light has directional behavior.

This theory redefines matter and antimatter from the standpoint of spatial tension:

- **Matter** is the **contracted state** of spatial tension—absorptive, cohesive, and inward-directed;
- **Antimatter** is the **expanded state** of tension—radiative, outward-pushing, and releasing.

They are not mutual destroyers, but **two polar expressions of space’s structural tension**,

and the transition between them is a **reversal of tension polarity within form**.

This transformation is directionally specific:

- Matter under extreme compression, absorbing light → becomes antimatter;
- Antimatter at maximum expansion, releasing tension → becomes matter and emits light.

This establishes a symmetry of behavior:

Table 1 Comparison of Matter and Antimatter

Property	Matter	Antimatter
Spatial Action	Cohesion, compression, light absorption	Expansion, tension release, light emission
Energy Expression	Stimulated emission (needs external compression)	Spontaneous emission (continuous release)
Prevalence	Stable in observable universe	Exists in high-energy stellar cores

Property	Matter	Antimatter
Transition Trigger	Extreme compression + light	Maximum expansion + light emission

Hence, the universe is not made of opposing particles, but of a dynamic system of **tensional flows** that alternate between contraction and release.

Chapter 3: The True Role of Light — A Participant in Structural Transformation

Conventional physics defines light as a massless energy packet (photon), believed to emerge from particle annihilation or generate particle pairs under high energy. But this model raises several paradoxes:

- Do particles truly "disappear"? Experiments show no net decrease in electrons;
- If light has no mass, how does it exert force or transfer momentum?
- Why would light "create" particles? Were the particles already present in a latent state?

This theory asserts that light is neither a byproduct of annihilation nor a direct particle generator.

Instead, light is the **form in which spatial tension is released or absorbed during structural transformations.**

The essence of light is:

A directional wave of tension — an energy unit participating in the restructuring of space.

Its behavior is bidirectional:

Table 2 Role of Light

Process	Role of Light	Examples
Matter → Antimatter (Black Hole)	Light is absorbed	Matter absorbs light to trigger structural reversal
Antimatter → Matter (Star)	Light is released	Tension released as antimatter converts to matter
Atomic transitions	Light is absorbed/emitted	Electrons jump between orbitals
Nuclear fusion/fission	Light released via compression	Structural change emits mesons and radiation

Thus, light is a visible signature of tension behavior.

It is not the "ashes of particles," but the "language of structural motion."

In the context of spatial pulsation,

light is the observable trace of form in motion — a necessary echo of shifting tension states.

Chapter 4: Black Holes and Main-Sequence Stars — Structural Reversal and the Cycle of Extremes

Black holes and main-sequence stars are typically regarded as the two most extreme celestial phenomena —

one consumes all, inescapable; the other shines brightly and radiates energy.

Yet their relationship is unclear in traditional models, lacking a coherent mechanism of interaction.

In the theory of spatial tension, black holes and stars are not opposites,

but **reverse phases of the same tension cycle** — an alternation between **extreme matter and extreme antimatter**.

1. Black Holes = Inverted structures of extreme matter compression

- A black hole's core is not empty, but a dense nucleus of matter compressed to the limit of tension;
 - This structure continuously absorbs light, further condensing space until a threshold is reached;
 - Matter + absorbed light → transforms into **extreme antimatter** (non-radiative);
 - Due to reversed tension polarity, the antimatter is expelled from the black hole's edge.
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2. Main-Sequence Stars = Expansive structures of extreme antimatter release

- The **extreme antimatter** expelled from black holes is highly dense and readily condenses into a stellar core;
 - The star shines not because of combustion, but due to the **ongoing release of tension** from its antimatter structure;
 - As it unfolds, the antimatter gradually transforms into stable matter;
 - The star's lifecycle is thus a spatial process of **antimatter** → **matter + light**.
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3. The Cycle:

Matter (normal state)

- Compressed to the extreme (black hole)
- Transformed into extreme antimatter (no light)
- Escapes → forms stellar core
- Releases tension → shines → becomes matter
- Star decays → collapses → returns to black hole

This creates a **closed loop of cosmic tension pulsation**, with black holes and stars as the poles of absorption and emission, compression and expansion.

Every star is a reverse memory of collapsed matter.

Chapter 5: The Spatial Mirror Principle Between Red Giant Expansion and Black Hole Collapse

In standard theories, the sudden expansion of red giants and the rapid collapse of black holes are treated as unrelated extreme events:

one due to “fuel exhaustion” in the stellar core, the other from gravitational mass threshold.

Yet the fact that both involve abrupt transitions at critical thresholds lacks a unified explanation.

In the spatial tension theory, red giants and black holes are time-reversed mirrors of spatial behavior:

one is an outward eruption caused by maximal tension release, the other an inward implosion from maximal tension compression.

1. Red Giant Expansion = Spatial behavior at the peak of antimatter release

Main-sequence stars are originally structured by extreme antimatter tension;

As they shine, this structure unfolds and transforms into matter;

When expansion reaches a critical threshold, the antimatter framework collapses;

Space tension flips outward → the star rapidly and dramatically inflates;

The structure enters a state of maximum tension release.

2. Black Hole Collapse = Spatial behavior at the limit of matter compression
Matter continuously aggregates under gravity, compressing spatial tension;

Upon reaching a structural limit, space tension implodes inward;

An event horizon forms; all matter and light are absorbed;

The structure enters a state of maximum tension absorption.

3. Mirror Structure Relationship:

Table 3 Red Giant vs Black Hole — Spatial Behavior Comparison

Behavior	Red Giant	Black Hole
Structural Seed	Extreme antimatter tension	Extreme matter tension
Spatial Action	Expansion, tension flipping outward	Contraction, tension collapsing inward
Observed Event	Sudden expansion + high luminosity	Sudden collapse + light absorption
Time Direction	Maximal release → outward eruption	Maximal compression → inward collapse
Cycle Position	Late-stage star highlight	Genesis of a new collapse cycle

This suggests that red giants do not expand simply because they “run out of hydrogen,” but because their tension structure can no longer contain the expanding antimatter — space flips outward and erupts.

Likewise, black holes do not contain “singularities,” but are the self-collapse of space torn by extreme matter compression.

Chapter 6: A Unified Tension-Based Explanation of Atomic Structure, Nuclear Reactions, and Everyday Phenomena

If the theory of spatial tension applies only to large-scale cosmic systems, it would be difficult to justify.

A truly persuasive theory must also explain microscopic structures and everyday physical phenomena.

In this chapter, we demonstrate:

From atomic structure to nuclear reactions, from electron transitions to thermal expansion,

all observable energy variations are fundamentally **expressions of spatial tension behavior**.

1. Atomic Structure and Electron Transitions

- Within the atom, electron orbits are not fixed paths, but **levels of spatial tension equilibrium**;
 - When an electron jumps from an outer to an inner orbit: structure compresses → tension is released → a photon is emitted;
 - When it jumps from inner to outer: a photon is absorbed → tension expands;
 - Thus, light absorption and emission are **expressions of tension release and uptake**.
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2. Nuclear Fission and Fusion as Tensional Processes

- Fission: a heavy nucleus is split → internal structure releases tension → radiation emitted (gamma rays, mesons);
 - Fusion: light nuclei merge under pressure → spatial tension is highly concentrated → light and new nuclei are released;
 - Both are not “mass-to-energy” conversions, but **reconstructions of structural tension**;
 - The so-called “mass deficit” corresponds to **tension being released in the form of propagating waves**.
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3. Thermal Expansion and Contraction: Everyday Spatial Behavior

- Heating → particles gain kinetic energy → spatial tension expands → volume increases;
 - Cooling → tension retracts → particle structures compress → volume decreases;
 - This needs no extra thermodynamic assumption—**tension dynamics suffice**.
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4. General Summary

Phenomenon	Explanation via Spatial Tension
Light emission	Tension release
Light absorption	Tension uptake, structural expansion
Nuclear fission	Structural tension release
Nuclear fusion	Tension compression, release via reversal
Thermal expansion/contraction	Spatial tension balance reconstruction

Thus, **tension is not an abstraction**,
but the **structural principle that connects stars with steel rulers**.

Chapter 7: Conclusion · The Ecological Flow of a Pulsating Universe and Its Future Outlook

We began with the extreme behaviors of black holes and stars, traversed the spatial symmetry of matter and antimatter, the true nature of light, and arrived at a unified understanding of atomic transitions and everyday phenomena—constructing a vision of the **universe as shaped and sustained by the pulsation of spatial tension**.

This theory seeks to answer the most complex phenomena with the simplest principle: The universe is not a pile of particles, but a **flow of spatial tension continuously transforming, releasing, and reorganizing itself through structure**.

Tension is not a hidden background field, but a structural force visible in every cosmic behavior—from stellar radiance, black hole absorption, particle metamorphosis, to the wavefronts of light.

This framework reaffirms several key positions:

1. **Antimatter is not an opposing particle, but a state of tension expansion;**
2. **Light is not an echo of annihilation, but the propagation of structural tension;**
3. **Black holes and stars are mirrored cycles of space, not terminal and origin;**
4. **All so-called “mass loss,” “particle creation,” and “energy release” are expressions of tension redistribution.**

This means:

- The universe requires no “dark matter,” “negative energy particles,” or “annihilation models” to explain its workings;

- It is self-consistent and whole, driven by the **alternating evolution of spatial structure and tension states**.

Looking forward, we may construct galactic models through tension networks,
map particle lifetimes and masses via tension spectra,
and perhaps even simulate a **cosmic genesis without the Big Bang**, driven instead by
oscillating tension fields.

If space is not the backdrop, but the subject—
then the universe is not a lucky blast, but **a rhythmic breath with memory and return**.

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