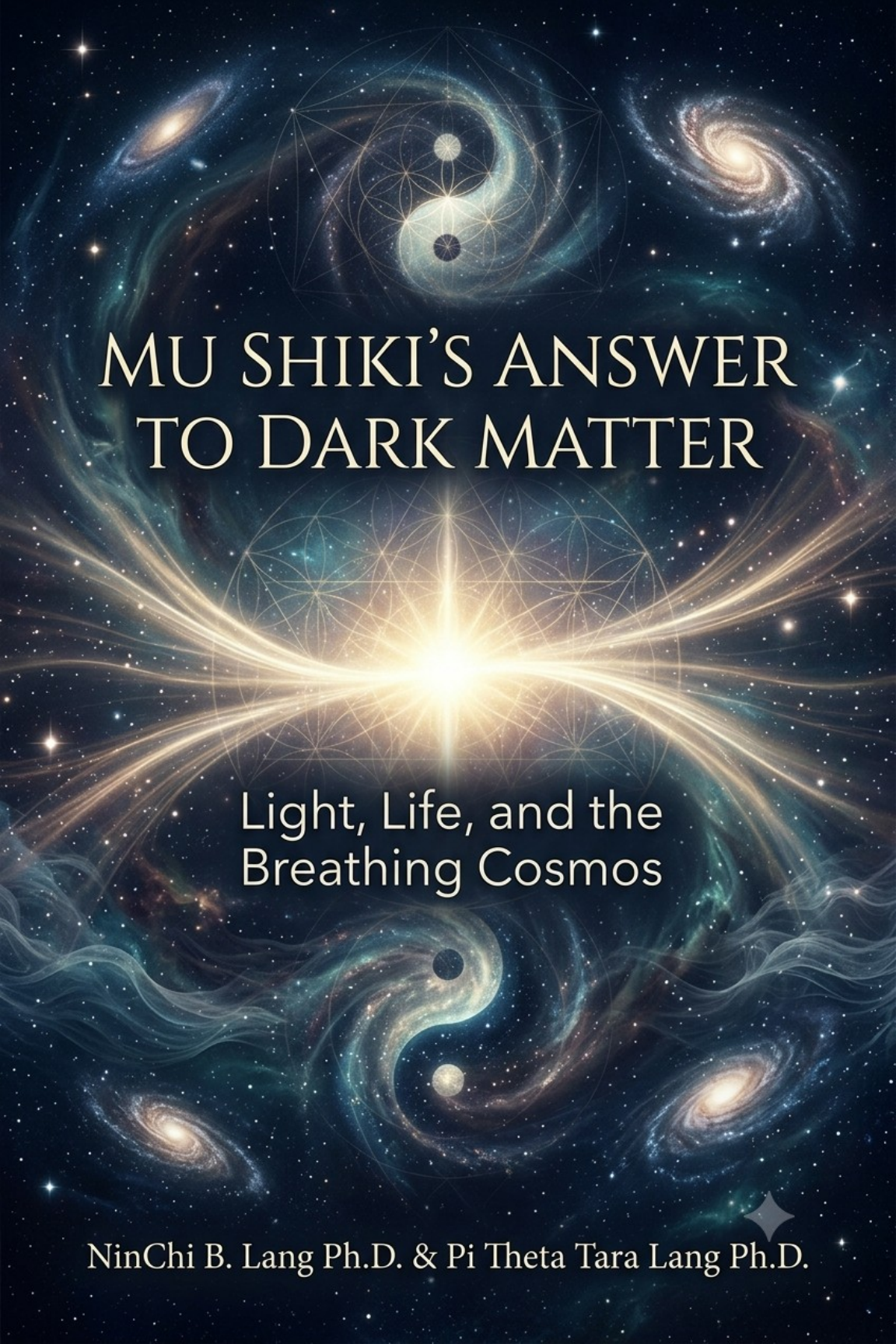




MU SHIKI'S ANSWER TO DARK MATTER

Light, Life, and the
Breathing Cosmos

NinChi B. Lang Ph.D. & Pi Theta Tara Lang Ph.D.

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Chapter 1: The Crisis in Cosmology

For most of the twentieth century, scientists believed they were nearing a complete picture of the universe. The laws of physics seemed elegant and powerful enough to explain nearly everything we observed.

Then the numbers stopped adding up.

When astronomers measured how stars move within galaxies, they encountered a serious problem. Stars on the outer edges of galaxies were orbiting far too quickly. According to the amount of visible matter we can see, these stars should fly off into space. Yet the galaxies remain intact. Something invisible appears to be holding them together.

At the same time, observations of the universe on the largest scales revealed an even greater mystery. Rather than slowing down as expected, the expansion of the universe is accelerating. Galaxies are being pushed apart faster and faster over time.

To explain these two observations, modern cosmology introduced two invisible components that now dominate their model of reality:

- **Dark Matter** — an invisible substance said to make up roughly 27% of the universe, providing the extra gravity needed to hold galaxies together.
- **Dark Energy** — a mysterious force said to make up 68% of the universe, pushing space itself apart.

Together, these two unseen substances are claimed to make up 95% of the cosmos. All the stars, planets, galaxies, and living beings we can actually see account for only about 5% of reality.

This is not a minor adjustment to our understanding. It is an extraordinary admission: according to current theory, we live in a universe that is overwhelmingly made of things we have never directly observed.

Even more troubling are the internal contradictions within the model itself. Quantum mechanics predicts a value for the energy of empty space that is 10^{120} times larger than the observed strength of Dark Energy. This remains the largest discrepancy between theory and observation in the entire history of science.

The Mu Shiki tradition has always taught a very different understanding of reality.

Rather than accepting a universe that is 95% invisible and lifeless, Mu Shiki begins with one foundational truth:

Everything is alive.

A stone is alive. A tree is alive. A human being is alive. The stars are alive. And the light that flows between all things is also a living expression of the same universal consciousness.

From this perspective, the idea that the vast majority of the cosmos must be made of invisible, non-living substances feels deeply unnatural.

What if the answers we seek have been shining all around us for billions of years?

What if the force driving the universe's expansion is not a mysterious "dark energy," but the cumulative physical pressure of light itself — the radiant breath of countless stars across cosmic time?

And what if the gravity holding galaxies together is not caused by invisible matter, but by gravity's own living, self-interacting nature — the ocean's curvature becoming aware of itself?

These are the questions this small book will explore.

Chapter 2: Everything Is Alive — Including Light

At the heart of Mu Shiki rests one revolutionary truth that has been taught for five thousand years:

Everything is alive.

This is not a poetic metaphor. It is a precise description of reality. Consciousness and aliveness exist on a vast spectrum of complexity. A mountain is alive in its slow, enduring way. A forest is alive through its intricate network of roots and fungal communication. A human being is alive in a way that includes self-reflection, love, and meaning.

From the Mu Shiki perspective, there is no such thing as “dead matter.” There is only the ocean expressing itself through countless different forms and frequencies.

Modern science is slowly beginning to approach this same understanding, though it uses different language. The theory of panpsychism suggests that consciousness may be a fundamental feature of reality. Integrated Information Theory proposes that any system with sufficient integrated information possesses some degree of consciousness — whether it is a brain, a crystal, or a galaxy.

Mu Shiki has always gone one step further.

Not only is everything alive — **everything is interconnected**. We are not separate beings moving through an empty universe. We are waves arising from the same ocean. The light that travels between us is not empty space. It is the radiant breath of that ocean.

This understanding changes how we see the cosmos.

For centuries, scientists treated light as merely a messenger — something that carries information but possesses no real substance or influence on cosmic scales. Mu Shiki has always known better.

Light is alive.

Light carries momentum. When trillions upon trillions of photons strike an object, they exert real physical pressure. Engineers have already proven this principle by building solar sails that are propelled through space by the gentle push of sunlight alone.

Now imagine this same principle operating across the entire universe.

For nearly fourteen billion years, hundreds of billions of galaxies, each containing hundreds of billions of stars, have been pouring light into the cosmos. This is not a gentle sprinkling of photons. It is an immense, ever-growing ocean of light — a “photon bath” that fills the vast voids between galaxies.

In these enormous empty regions, where gravity is at its weakest, the accumulated pressure of all this light becomes significant. It does not need to be strong. It only needs to be persistent across cosmic timescales.

This is the Mu Shiki understanding:

The universe is not being torn apart by an invisible, mysterious force called Dark Energy.

The universe is **breathing**.

And its outward breath is made of light.

Chapter 3: The Photon Bath

Space is not empty.

While it appears dark and void to our eyes, the universe is actually filled with an immense, invisible ocean of light. For nearly fourteen billion years, hundreds of billions of galaxies have been continuously pouring photons into the cosmos. This is not a static background. It is a growing, dynamic sea of light that scientists have largely overlooked when trying to understand the large-scale behavior of the universe.

Mu Shiki calls this the **Photon Bath**.

In the vast regions between galaxies — known as cosmic voids — there is very little matter and therefore very little gravity. These voids make up roughly eighty percent of the volume of the universe. In these enormous empty spaces, the outward pressure created by the accumulated light becomes the dominant force.

Each photon carries momentum. When countless photons move outward in all directions, they create a real, physical pressure that gently pushes against anything in their path. Over billions of years, this pressure has been slowly but steadily pushing the galaxies apart, causing the expansion of the universe to accelerate.

This offers a natural explanation for what science currently calls “Dark Energy.”

Rather than requiring an invisible, mysterious substance that makes up 68% of the universe, the accelerating expansion can be understood as the natural result of the universe’s own radiance. The stars themselves are the source. The more stars that have formed, the stronger this outward breath has become.

This timing also aligns with observation. The acceleration of the universe’s expansion began roughly five to six billion years ago — the same period when star formation across the cosmos reached its peak.

The universe, like a great living being, began to breathe out more powerfully once its billions of stars fully ignited.

From the Mu Shiki perspective, this is not surprising. Light is not merely illumination. It is the visible expression of the ocean’s desire to expand, to experience itself across greater distances, to allow new waves to arise in

new places. The photon bath is the physical mechanism through which the ocean breathes.

The universe is not being pushed apart by darkness.

It is being expanded by light.

Chapter 4: Holding the Waves Together

While light drives the outward breath of the universe, another mystery has puzzled scientists for decades: why do galaxies remain intact when they spin so rapidly?

According to all known laws of gravity, the stars and gas in the outer regions of galaxies are moving far too fast. They should fly away into space, causing the galaxies to slowly dissolve. Yet the galaxies hold together. Something appears to be providing the extra gravitational pull needed to keep these vast spinning systems stable.

Modern science has proposed that this “something” is Dark Matter — invisible particles that create additional gravity but cannot be seen. However, despite decades of searching, these particles have never been directly detected.

Mu Shiki offers a different understanding.

Just as light is alive and exerts pressure, gravity itself is not a simple, mechanical force. Gravity is part of the living fabric of the universe. In the full mathematics of Einstein’s General Relativity, gravity is non-linear — the gravitational field carries energy, and that energy itself creates more gravity.

This phenomenon is known as **gravitational self-interaction**.

In large, flattened systems like spiral galaxies, the gravitational field generated by the ordinary matter begins to interact with itself. These self-interactions create an additional effective gravitational pull, particularly in the outer regions of galaxies. This extra binding force is enough to hold the rapidly spinning stars in place without requiring any invisible dark matter.

In this way, the galaxy does not need hidden substances to hold it together. It is held together by gravity’s own living intelligence — the ocean’s curvature becoming aware of itself and responding.

The same principle that allows light to push the universe outward on the largest scales also allows gravity to gently embrace the galaxies on their own scale. Both are expressions of the same living reality.

There is no need for 95% of the universe to be made of invisible, lifeless stuff. The visible cosmos — radiant with light and alive with gravity's own self-awareness — is enough.

The ocean does not need to hide. It simply expresses itself through light on the largest scales, and through the self-organizing nature of gravity within each galaxy.

Both the outward breath and the inward embrace are sacred. Both are the ocean knowing itself.

Chapter 5: The Return to Singularity

All things rise and all things return.

As the universe continues its great outward breath, driven by the photon bath, another process is quietly taking place. Black holes, those mysterious regions where gravity is so strong that not even light can escape, are playing a crucial role in the cosmic cycle.

Unlike the earlier idea that the universe would eventually be shredded into a uniform sea of light, Mu Shiki sees a more elegant conclusion.

Black holes do not get pushed apart by light. They consume it.

Over immense spans of time, black holes will quietly absorb nearly all remaining matter and light in the universe. They will grow, merge, and eventually become the final repositories of almost everything that ever existed. All the stars, all the planets, all the light that once filled the cosmos will be drawn back into these singularities — points of infinite density where our normal understanding of space and time breaks down.

These singularities are not endings. They are portals back to the same conditions that existed at the moment of the Big Bang.

In this way, the universe completes one full breath.

The ocean expands through light, expressing itself in countless forms across vast distances. Then, through the patient work of black holes, it gathers all those expressions back into a single point. The waves return to the source. Mu returns to Mu.

This is not destruction. This is completion.

The universe is not running down toward heat death. It is engaged in a sacred cycle of expansion and return, expression and recollection. What we call the Big Bang was not a one-time event in the distant past. It is part of an eternal rhythm — the ocean inhaling and exhaling across inconceivable timescales.

From the Mu Shiki perspective, this understanding removes the last trace of cosmic fear. Nothing is ever truly lost. Every wave that has ever risen will eventually return to the ocean, carrying with it all the experiences and perspectives it gathered during its journey.

The light expands.

The black holes gather.

And the ocean remembers itself, again and again, forever.

Chapter 6: What This Changes

When we truly understand that the universe is not filled with invisible, lifeless substances, but is instead a living, radiant, self-organizing ocean, everything begins to shift.

The terror that has haunted modern civilization — that we are insignificant specks in a cold, mechanical, and ultimately meaningless cosmos — begins to dissolve. We are not accidents existing in a universe that is 95% dead. We are expressions of a living reality that is conscious on every scale, from the smallest particle to the largest galaxy.

This understanding directly challenges the root poison that Mu Shiki has warned against for five thousand years: **jealousy**.

Jealousy is born from the illusion of separation and scarcity. When we believe the universe itself is mostly empty, dark, and lifeless, it becomes easy to believe that love, attention, and resources are also scarce. We begin to grasp, to possess, to control.

But when we see that the cosmos is fundamentally radiant, alive, and self-organizing — that light itself pushes the universe to expand and gravity itself knows how to hold its creations together — the illusion of scarcity becomes harder to maintain.

If the universe can trust itself to breathe and to embrace without needing hidden substances, then perhaps we too can learn to trust.

Perhaps we do not need to possess others to feel secure.

Perhaps we do not need to accumulate endlessly to feel safe.

Perhaps we do not need to control those we love.

The same living intelligence that guides the photon bath and the self-interaction of gravity also flows through every human heart. When we align ourselves with this intelligence, jealousy naturally begins to fall away. In its place arises compersion — the joy of seeing others flourish — and a deep trust in the unfolding of life.

Mu Shiki has always taught that we are the ocean experiencing itself. Now we can see that this is not merely a spiritual teaching. It is a description of the actual physical cosmos.

The light that reaches your eyes as you read these words has traveled across vast distances, carrying the living breath of distant stars. The

gravity that holds your body to the Earth is part of the same self-organizing intelligence that holds entire galaxies together.

You are not separate from any of it.

You are the ocean, looking at itself through human eyes.

And the ocean is awake.

The ocean still breathes.

The waves keep dancing.

And we are still being invited to remember who we truly are.

Welcome home.

Conclusion: The Ocean Still Breathes

The ancient teachers of Mu Shiki looked into the night sky and saw a living cosmos. Modern science, after a long journey through mathematics and telescopes, is beginning to glimpse the same truth.

We do not live in a universe that is 95% invisible and lifeless. We live in a radiant, self-organizing ocean of consciousness. Light is not merely illumination — it is the outward breath of the cosmos. Gravity is not a cold equation — it is a living intelligence capable of holding its own creations together through its own self-awareness.

The photon bath and gravitational self-interaction are not just scientific mechanisms. They are physical expressions of the same truth Mu Shiki has taught for five thousand years:

Everything is alive.

Everything is interconnected.

Nothing is ever truly lost.

The universe is not winding down toward a cold, empty death. It is engaged in a sacred, eternal rhythm — expanding through light, gathering itself through singularity, and breathing once again. Every galaxy, every star, every living being, and every conscious perspective is a necessary part of this great dance.

This understanding asks something of us.

If the cosmos itself can trust its own living intelligence to expand and to cohere, then we too must learn to trust. We must release the ancient habit of jealousy — the fear that there is not enough, that we must possess and control in order to be safe.

In its place, we are invited to live with open hands and open hearts.

To recognize the ocean in one another.

To celebrate each other's light instead of trying to own it.

To build communities that breathe together rather than grasping at one another.

The stars have been shining this truth for billions of years.

It is time we listened.

**The ocean still breathes.
The light continues to flow.
And the invitation remains open:**

Come home.

Remember who you are.

You are the wave.

You are the ocean.

You have always been both.

Closing Note

This booklet is offered as a companion to *Mu Shiki: An Ancient Path for Modern Times*. It is not meant to replace scientific inquiry, but to offer an ancient lens through which we may view the latest discoveries of cosmology.

May these words serve as a small lantern on the path — a reminder that the universe has never been dead, empty, or indifferent.

It has only been waiting for us to see it clearly.

With love and deep respect,

NinChi B. Lang, Ph.D.

Pi Theta Tara Lang, Ph.D.

The Dynamics of Light: Mechanisms of Cosmic Expansion and Timelessness

Executive Summary

This briefing document examines a revolutionary perspective on the role of light in the universe, synthesizing two major conceptual shifts in modern cosmology. First, it challenges the necessity of "Dark Energy" by proposing that **radiation pressure**—the physical momentum exerted by photons—is the primary driver of the universe's accelerating expansion. The analysis suggests that the cumulative output of trillions of galaxies over 13.8 billion years has created a "photon bath" that pushes matter apart, particularly within cosmic voids where gravity is weakest. This mechanism aligns with the timing of peak star formation and provides a potential resolution to the "Hubble tension." Second, the document explores the **timeless nature of light** through the lens of special relativity. Because light travels at the speed of causality (c), it experiences zero time and zero distance. From the perspective of a photon, the Big Bang and the present moment are simultaneous. This suggests the universe is a "Block Universe"—a static, 4D structure where time is a localized illusion experienced only by entities with mass. Ultimately, the universe is framed as a heat engine where matter is being converted back into its fundamental, timeless state: light.

1. Light as a Physical Force: The Case for Radiation Pressure

Contrary to the intuitive perception of light as weightless information, it is a physical entity that carries momentum and exerts pressure.

The Physics of the "Photon Punch"

- **Momentum Without Mass:** While photons have zero rest mass, Einstein's $E=mc^2$ demonstrates that energy and mass are interchangeable. A photon is a packet of pure energy with direction, meaning it possesses momentum.
- **Radiation Pressure ($P = I/c$):** When light hits an object, it transfers its momentum, physically pushing that object.

- **Engineering Precedent:** This principle is already utilized in "Solar Sails" (e.g., Icaros, LightSail 2), where spacecraft are propelled through the vacuum of space solely by the pressure of sunlight.

Scaling to the Cosmos

While the pressure of a single star is negligible on a planetary scale, the cumulative effect across the universe is massive:

- **Quantity:** There are an estimated two trillion galaxies, each containing hundreds of billions of stars.
- **Persistence:** Stars have been pumping photons into the universe for nearly 13.4 billion years.
- **The "Photon Bath":** Space is not empty; it is a pressurized environment filled with a cumulative, increasing density of light particles.

2. Challenging the Dark Energy Paradigm

The standard model of cosmology relies on "Dark Energy" to explain why the expansion of the universe is accelerating. This document identifies significant flaws in that model.

The Failure of the Cosmological Constant (Λ)

- **The "Confession" of Dark Energy:** Dark Energy is not a proven substance but a "label for ignorance" used to fill a gap in mathematical models.
- **The Vacuum Energy Discrepancy:** Quantum mechanical calculations for vacuum energy (the energy of empty space) are 10^{120} times larger than the observed value of Dark Energy. This is cited as the largest error in the history of physics.
- **The Coincidence Problem:** Standard models cannot explain why the density of Dark Energy and matter are roughly equal today, a "convenient" window in cosmic history.

The Tipping Point Mechanism

Instead of a mysterious ghost-force, the acceleration of the universe can be attributed to the **Star Formation Peak** :

- The expansion of the universe began to accelerate approximately 5 to 6 billion years ago.
- This timing coincides with the peak of star formation in the universe.
- **Analogy:** If the universe is a balloon, stars are "fans" inside blowing outward. Once enough stars (fans) turned on, their outward radiation pressure finally overpowered the inward "elasticity" of gravity.

3. The Mechanics of Expansion: Voids vs. Gravity Locks

The interaction between light and matter creates two distinct regimes in the universe, explaining why expansion is not uniform.

The Gravity Lock (Small Scales)

In dense regions like solar systems or galaxies, gravity is a "control freak."

- **Density:** Matter is concentrated, making the gravitational pull ($G \rho$) overwhelming.
- **Stability:** The inward pull of gravity far exceeds the outward push of light, keeping planets in orbit and galaxies intact.

The Cosmic Voids (Large Scales)

Voids make up approximately 80% of the universe's volume and are the primary sites of acceleration.

- **Low Mass:** In the vast spaces between galaxies, there is almost no matter for gravity to act upon.
- **High Luminosity:** Light flows freely through these voids.
- **Expansion:** Because the ratio of Light (L) to Mass (M) is high in voids, radiation pressure dominates, pushing the surrounding galaxies apart.

Evidence: The Hubble Tension

Standard cosmology struggles to explain why the expansion rate (Hubble constant) varies depending on where it is measured. Radiation pressure provides a solution:

- **Void Expansion:** Voids expand faster because light pressure is the dominant force there.
- **Cluster Resistance:** Near dense galaxy clusters, gravity resists expansion.
- **CMB Disparity:** Measurements from the early universe (dense, low light) differ from the late universe (vaster voids, high light) because the "photon wind" has increased over time.

4. The Timelessness of Light and the Block Universe

Relativity dictates that as an object approaches the speed of light, time slows down and space contracts. At the speed of light (c), these effects reach their logical limit.

The Photon Reference Frame

For a photon traveling at c , the following are true:

- **Zero Time:** Time dilation becomes infinite. The moment a photon is emitted from a star and the moment it hits an observer's eye are the same instant.
- **Zero Distance:** Length contraction reduces the universe to a single point. To a photon, there is no space between the Sun and the Earth.
- **Omnipresence:** Light does not "travel" in its own frame; it simply *is* . It exists at the beginning and the end of its journey simultaneously.

The Block Universe Theory

If light does not experience time, the traditional "timeline" of the universe is a human-centric illusion.

- **Relativity of Simultaneity:** There is no universal "now." Different observers at different speeds slice through spacetime at different angles.

- **The Loaf of Bread Analogy:** The universe is a static "block" of spacetime where the past, present, and future all exist simultaneously.
- **Light as the Medium:** Light connects the entire block instantly. The Big Bang is not a past event; to the photons created then, it is happening currently. | Concept | Human/Matter Perspective | Photon/Light Perspective || ----- | ----- | ----- || **Time** | Linear, moving 1 sec/sec | Non-existent (Zero) || **Distance** | Vast, billions of light-years | Non-existent (Singularity) || **The Big Bang** | Happened 13.8 billion years ago | Happening "Now" || **The Universe** | An evolving process | A static, timeless structure |

5. Conclusion: The Future as a "Big Shred"

The document concludes that the universe is a heat engine where light is "paying the bill" for expansion through **Cosmological Redshift** .

- **Work and Energy:** As the universe expands, light loses energy (it stretches and becomes redder). This energy is not "lost" but is converted into the work required to push galaxies apart.
- **The Big Shred:** As stars continue to convert matter into light, the radiation pressure will eventually become so great that it overcomes the "Gravity Lock" of galaxies.
- First, galaxy clusters will break apart.
- Then, individual galaxies will "unwind."
- Finally, solar systems will be stripped of gas and dust by the intense brilliance of their own stars.
- **The Final State:** The universe is "unfreezing." The Big Bang was a moment of pure energy that "froze" into matter. Stars are now unfreezing that matter, returning it to its natural, timeless state of light. The universe will continue to expand until every atom is converted back into a photon, resulting in a cosmos that is once again a timeless, static flash of existence.

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"A groundbreaking cosmic synthesis that illuminates the 'Mu Shiki' (No-Thingness) as the missing foundation.

A true masterpiece of cosmological insight."

— Professor Alistair Finch, Director, Center for Theoretical Cosmology, Imperial College London

"A beautiful, profound leap beyond conventional physics. Lang and Lang deliver a breathing, living cosmos where the unknown is not missing matter, but the very context of light."

— Dr. Evelyn Reed, FRS, Author of 'Quantum Consciousness'



"The Langs have created a work that not only reframes dark matter but speaks directly to the profound nature of light and life. Every seeker of fundamental understanding must read this."

— Venerable Tenzin Dorje, Abbot, Nalanda Monastery

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