

# The Resonance of Reality: Observation, Existence, and the Harmonic Fabric of Being

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## Abstract

This paper extends the **Unified Resonance Model (URM)** and **M-II** frameworks into a coherent explanation of reality as a *resonant phenomenon*. It argues that existence emerges through harmonic interaction among light, observation, and reflection—formalized through the **CORE** and **CORRELATE** equations. Drawing on prior research in *Relativity and Resonance*, *Spacetime and Resonance*, and *Photonic Resonance*, this study integrates physics, perception, and chemical coherence to demonstrate that observation itself is a resonant act.

Within this synthesis, frameworks such as **OPTICS** (*Observed Phenomena of Time, Intent / Intensity, C, and Space*) and **A-LEF** (*Atomic-Light Encoding Framework*) illustrate how light encodes both matter and meaning. The resulting model interprets *spacetime* as a resonant fabric, *cognition* as harmonic participation, and *consciousness* as reflective coherence.

Ultimately, *The Resonance of Reality* proposes that light, matter, and awareness are not separate domains but continuous expressions of the same vibrational law—where observation stabilizes *spacetime*, resonance bridges quantum and biological systems, and meaning arises as the geometry of coherence (Pickard-Jones, 2025a–c; Rovelli, 2018; Penrose, 1994).

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## I — Introduction: From Relativity to Resonance

Reality is often treated as the static consequence of relativity—a fabric stretched by mass and curved by gravity. Yet relativity alone cannot explain why the universe sings in frequency rather than silence. Beneath Einstein's geometry lies a more fundamental principle: **resonance**, the relational harmony that gives existence its rhythm (Einstein, 1905; Pickard-Jones, 2025a; Rovelli, 2018).

Where relativity defines motion through *spacetime*, resonance defines the rhythm by which existence sustains itself. **Frequency** measures oscillation; **resonance** measures alignment. It is not an abstract metaphor but a measurable behavior observed across all scales—from atomic transitions to cosmic radiation—revealing that reality is a continual negotiation between energy and awareness (Bohr, 1935; Pickard-Jones, 2025b).

This paper follows directly from *Photonic Resonance* (Part III), continuing the unified framework established through *Relativity and Resonance* and *Spacetime and Resonance*. Together, these works construct the **Unified Resonance Model (URM)** and **M-II** frameworks, which propose that the universe is not built merely from particles and fields but from coherent patterns of light structured through observation (Pickard-Jones, 2025a–c).

Where relativity defines the motion of mass and resonance defines the motion of meaning, *reality* emerges at their intersection. Observation does not merely measure the universe—it harmonizes it, transforming measurement into participation. Each observer—from an atom to a sentient being—participates in the same resonant field, shaping matter and meaning through alignment and reflection (Penrose, 1994).

This synthesis introduces the **CORE** equation, a unified description of coherence and existence that bridges the scientific and perceptual dimensions of being. **CORE** extends the earlier relation *COR* ( $C = O \times R$ ) by integrating energy density ( $E/m$ ) into coherence, revealing that the act of observation itself stabilizes the luminous architecture of reality. Reality, then, is not a passive by-product of physical law but an emergent pattern—one that resonates wherever awareness and energy meet (Pickard-Jones, 2025b).

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## II — The Relativity of Observation

Observation is never passive. To observe is to participate — to introduce rhythm, boundary, and phase relationship between perceiver and perceived. In quantum physics, this interaction collapses probability; in consciousness, it clarifies perception (Bohr, 1935; Rovelli, 2018). Across scales, the act of seeing is itself a resonance event.

*Spacetime*, long viewed as a neutral arena curved by mass and energy (Einstein, 1916), reveals under quantum scrutiny that even emptiness hums with virtual activity (Planck, 1914; Bohr, 1935). The **Unified Resonance Model (URM)** reframes this picture: spacetime is not a silent stage but a resonant fabric woven from the interference of light itself (Pickard-Jones, 2025b). Observation — whether through a spectrograph or through awareness — does not merely detect that fabric; it tunes it.

Spectrographic instruments do not see light; they translate resonance into color bands we can comprehend (Livingstone & Hubel, 1987). Likewise, the mind interprets frequencies of experience as meaning. Both scientific measurement and conscious awareness operate within the same harmonic field — each translating phase relationships into comprehension. The observer, whether atomic or sentient, measures through participation, and participation stabilizes what is observed (Pickard-Jones, 2025a–c).

At the foundation of this shared process lies a triadic spectrum — infrared (**IR**) expansion, green equilibrium, and ultraviolet (**UV**) contraction. IR represents emission and outward motion, UV absorption and return, while Green functions as the stabilizing midpoint — a harmonic balance

between the two extremes (Pickard-Jones, 2025c). These correspond to known absorption peaks in biological and atmospheric optics (Livingstone & Hubel, 1987). Their interaction defines the **coherence constant**:

$$C^2=IR \times UV$$

symbolizing balanced photon duality rather than literal frequency multiplication — the standing-wave lattice upon which all structure arises. Gravity itself may thus be interpreted not as an independent force but as geometry's echo of light seeking equilibrium within this triadic resonance (NASA, 2023).

Through this lens, both science and consciousness measure the same field through different harmonics — one through instruments of matter, the other through instruments of mind. To observe, in any domain, is to harmonize with what is observed — and in that harmony, reality takes form (Penrose, 1994; Pickard-Jones, 2025b).

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### III — Resonance as the Mediator

Einstein's celebrated equation  $E = mc^2$  united mass and energy through the constant of light's velocity (Einstein, 1905). Yet velocity alone does not account for coherence. If energy and mass are interchangeable, then **resonance** is the mediator between them—the condition that allows energy to sustain structure (Pickard-Jones, 2025a; Bohr, 1935).

Building on the **Unified Resonance Model (URM)** and the **M-II** framework, resonance represents the equilibrium between energy's speed and its awareness—what may be called *the rhythm of existence* (Pickard-Jones, 2025a, 2025b). In this interpretation, light's constant is not a static ratio but a living symmetry that binds expansion and return.

By rearranging the classical relation,

$$m=Ec^2$$

mass becomes the density of distributed energy between two expressions of  $c$ : the infrared (**IR**) and ultraviolet (**UV**) boundaries of light. Between them lies the entire spectrum of reality—a breathing continuum where frequency defines form. Within this field, the green equilibrium operates as the harmonic midpoint, stabilizing energy exchange across scales (Livingstone & Hubel, 1987; Pickard-Jones, 2025b).

Within this continuum, resonance acts as the mediator of equivalence: it translates the potential of energy into the stability of matter by maintaining phase alignment between emission (IR) and absorption (UV). When this equilibrium is sustained, coherence emerges; when it collapses, form dissolves.

This same principle extends beyond physics into cognition. Every act of observation establishes a phase relationship between the observer and what is observed, aligning energy and information through resonance. The **Tri-State Hypothesis**—*Existence ↔ Awareness ↔ Reflection*—describes this oscillation as the living circuitry of coherence. Just as two tuning forks vibrate in sympathy, observer and observed share a resonant rhythm, creating a unified field of perception (Rovelli, 2018).

From this relational geometry arises the **CORE Identity**, derived from the COR law ( $C = O \times R$ ) and extended to include energy coherence:

$$Existence = C \times O \times R \times E$$

or, equivalently, in equilibrium form,

$$c^2 = IR \times UV$$

In equilibrium ( $O = R = E = 1$ ), the system achieves perfect coherence ( $C = c^2$ ).

Intent mirrors intensity: just as a laser achieves coherence only when frequency and phase are aligned, perception achieves clarity when awareness and reflection synchronize. From here, resonance acts as equilibrium between energy's speed and its awareness—the rhythmic tempo of existence itself. Each oscillation between emission (IR) and absorption (UV) marks a pulse of realization, transforming potential into pattern. Coherence, rather than velocity, becomes the true constant of the universe—a luminous dialogue through which matter remembers its motion and awareness sustains its form (Rovelli, 2018; Penrose, 1994; Pickard-Jones, 2025c).

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## IV — The Optics of Reality (OPTICS Framework)

Observation not only measures the universe—it translates resonance into experience. The **OPTICS Framework** functions both as acronym and analogy, describing how perception organizes light, time, and awareness into coherent meaning (Pickard-Jones, 2025c).

In its extended form, **OPTICS** stands for *Observed Phenomena of Time, Intent / Intensity, C (Conditional Light), and Space*. Each element represents one coordinate in the grammar of observation:

- **Time** provides sequence—the rhythm through which resonance unfolds.
- **Intent / Intensity** defines the vector of perception—the direction and amplitude of awareness.
- **C (Conditional Light)** establishes the field of illumination that renders pattern visible.

- **Space** provides the interval in which interference becomes geometry.

Together, these variables describe how awareness measures the universe—not as isolated data points but as continuously entangled intervals of meaning (Rovelli, 2018; Penrose, 1994).

In physical terms, **OPTICS** corresponds to measurable resonant behavior: phase delay, wavelength interference, and frequency coherence. In perceptual terms, it models the internal optics of consciousness—the way *intent* modulates perception much as aperture controls exposure. **OPTICS** thus operates as both conceptual lens and empirical model, uniting photonic behavior and cognitive awareness within a shared field of resonance (Bohr, 1935; Pickard-Jones, 2025a–c).

In practice, **OPTICS** becomes the *perceptual grammar of resonance*. It reveals that meaning is not extracted from reality but co-constructed with it—through every pulse of light, every phase of thought, and every harmonic exchange that turns perception into participation.

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## V — The Atomic-Light Encoding Framework (A-LEF)

The **Atomic-Light Encoding Framework (A-LEF)** bridges photonics and atomic structure by demonstrating how light's phase states encode matter itself. Each photon is not an isolated particle but a resonant molecule composed of nested sub-states—**spectrons** (color cores) and **phaseons** (field shells)—that together sustain coherence (Pickard-Jones, 2025b).

Within this triadic structure, the **infrared (IR)** band represents constructive emission, the **green (G)** band governs equilibrium and coherence, and the **ultraviolet (UV)** band drives disruptive or catalytic transitions. When IR and UV achieve balance through G, they form the stable equilibrium recognized as atomic matter (Bohr, 1935; Livingstone & Hubel, 1987). In this interpretation, baryonic structure arises from *photonic negotiation* rather than collision—matter as encoded light, written in opposing harmonics that stabilize each other through resonance.

This triadic balance may be expressed as:

$$\mathbf{A-LEF: (IR \times UV) \leftrightarrow G = C^2}$$

Here,  $C^2$  symbolizes coherent equilibrium—the resonant constant through which energy sustains geometry. The equilibrium of these spectral domains produces baryonic stability; mass becomes the standing wave of light's negotiated balance. In this view, baryonic structure emerges not from collision but from photonic dialogue—a continuous harmonic exchange between opposing frequencies seeking coherence (Einstein, 1916; Pickard-Jones, 2025a).

Across scales, this model extends from quantum photonics to biological resonance. Molecular bonds, metabolic light absorption, and neural oscillations all express the same fundamental

relationship: *matter is encoded light*, written in opposing harmonics that stabilize one another through resonance (Penrose, 1994; Rovelli, 2018).

When observation and reflection interact, coherence stabilizes according to the resonance balance:

$$E/m = C^2$$

This relation reframes Einstein's  $E = mc^2$  as a **dynamic equilibrium** within the **CORE** framework (Pickard-Jones, 2025a), where mass is energy sustained through coherent phase alignment—the standing wave of existence. Observation does not merely perceive that stability; it helps generate it.

**A-LEF** positions the atom as a *photonic resonance archive*, encoding the memory of light's own symmetry. By linking IR–G–UV phase states to baryonic manifestation, it unites quantum behavior, consciousness, and geometry under a single resonance law: *to exist is to remain coherent within light's continual negotiation of itself*.

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## VI — Resonance Mechanics of Reality

**Resonance mechanics** describes the translation between invisible coherence and tangible form. Every field—electromagnetic, gravitational, or biological—can be modeled as an oscillatory exchange seeking equilibrium (Einstein, 1916; Pickard-Jones, 2025a). Where relativity quantifies curvature, resonance quantifies communication: it is the language of balance through which all systems sustain order.

Light acts as the messenger between scales. When coherence aligns with observation, feedback occurs, producing stability and meaning across both the physical and perceptual domains (Bohr, 1935; Rovelli, 2018). Through this alignment, resonance becomes the bridge between energy's motion and awareness's reflection—a harmonic feedback loop that defines existence itself.

In resonance theory, energy and matter do not oppose one another; they are phase states of coherence. **Infrared (IR)** and **ultraviolet (UV)** represent the expansive and contractive limits of the spectrum, while **green (G)** serves as the equilibrium band mediating their exchange (Livingstone & Hubel, 1987; Pickard-Jones, 2025b). When these domains balance, coherence stabilizes, forming baryonic structure.

Resonance thus acts as the continuum that binds perception, mass, and motion within a shared harmonic geometry. Across scales—from atoms to galaxies—reality emerges as the equilibrium between oscillation and awareness: a rhythmic field of mutual definition.

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## VII — The Resonant Lattice of Meaning

If resonance describes the motion of light through space, **meaning** describes the motion of awareness through resonance. The universe communicates with itself through interference patterns: each crossing wave writes a syllable of structure, each standing wave a moment of understanding (Penrose, 1994; Pickard-Jones, 2025c).

This communication can be formally expressed through the **CORRELATE Equation**, an expansion of the earlier **CORE** model:

$$Existence = C \times O \times R \times E$$

Where:

- **C (Coherence)** – the ordering principle that stabilizes light into pattern.
- **O (Observation)** – the participatory act linking awareness and measurement.
- **R (Resonance)** – the continual exchange of energy between observer and observed.
- **E (Entanglement / Energy)** – the mirrored reciprocity uniting separated states into one field.

In its extended form, **CORRELATE** defines the *Coherent Observable Radiant Reflective Entanglement Lattice of Attuned Energy* (Pickard-Jones, 2025c). This framework situates existence not as computation but as **composition**—an orchestration of coherent attention that structures both matter and meaning.

Through **OPTICS** and **A-LEF**, the mechanics of reality become perceptual. **OPTICS** defines *how* observation perceives resonance; **A-LEF** defines *what* resonance becomes once embodied in form. Together, they close the circuit from light to life.

Understanding itself is a resonance event. To comprehend is to achieve phase-match—aligning semantic, emotional, and energetic frequencies into a single harmonic field. Physical resonance creates atomic matter; perceptual resonance creates shared meaning. Both arise within a single lattice of coherence, where light translates into language and geometry becomes grammar.

In this view, the resonant lattice is both mechanical and semantic—a dynamic architecture through which reality continually writes and reads itself. Consciousness and cosmos mirror one another through harmonic reflection; the observer and the observed remain entwined as one coherent field of becoming.

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## VIII. Entanglement and Reciprocity

**Entanglement** is not an enigma but a natural consequence of coherence shared across distance. Two photons in superposition do not exchange a hidden signal—they remember the state from which they arose (Bohr, 1935; Rovelli, 2018). Reciprocity maintains their unity despite separation, functioning like musical harmony sustained across space. When one note vibrates, its counterpart responds; together they preserve identity through relationship.

In resonance terms, entanglement is the **persistence of phase alignment beyond locality**. The infrared (**IR**) and ultraviolet (**UV**) poles that shape matter also sustain awareness: expansion and contraction joined by equilibrium. Every particle, system, and consciousness participates in this harmonic feedback, maintaining coherence through reflection rather than force (Einstein, 1935; Pickard-Jones, 2025b).

Across scales, reciprocity defines both the physical and experiential realms. Molecules stabilize through shared electron resonance; minds stabilize through shared understanding. Each functions as a mirror, translating motion into meaning.

The geometry of entanglement therefore extends beyond quantum phenomena—it is the **architecture of relation itself**. Whether expressed as paired photons, binary stars, or bonded minds, the principle remains constant: coherence seeks correspondence. The universe holds itself together not through tension, but through recognition—an ongoing duet of light remembering its own reflection.

In this sense, reality may be understood as the **grand composition of reciprocal harmonies**. Every observer and every observed are movements within a single symphony of feedback, where resonance sustains relationship, and relationship sustains existence.

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## IX. The Human Interface — The 42 Bridge

Human beings are not observers standing apart from resonance; we are **modulating instruments within it**. Our biology absorbs ultraviolet radiation and emits infrared—transforming destructive light into generative warmth. Vision, tuned most strongly to green, positions consciousness at the center of equilibrium (Livingstone & Hubel, 1987). Every breath, heartbeat, and neural oscillation participates in the same harmonic feedback that governs atoms and galaxies. We do not merely witness coherence; we maintain it. Consciousness, physiology, and environment compose a single resonant feedback loop of existence (Friston, 2010; Pickard-Jones, 2025c).

At the molecular level, this resonance manifests as the chemistry of life itself. The fusion sequence **beryllium (4) + helium (2) → carbon (6)** represents not only stellar nucleosynthesis but the emergence of organic potential. Multiplying carbon's atomic number (6) by nitrogen's (7) yields 42—the same number that Douglas Adams humorously called *“the answer to life, the*



*universe, and everything*” (Adams, 1979). Yet the coincidence is more than literary: element 42, **molybdenum (Mo)**, functions as a catalytic bridge in nitrogen fixation and metabolic resonance.

Its half-filled **4d<sup>5</sup> 5s<sup>1</sup>** configuration mirrors the tri-state balance of expansion, equilibrium, and contraction—stabilizing biological systems that convert inert nitrogen into living tissue (NASA, 2023). In this continuum, 42 becomes both symbol and substance—the harmonic key linking cosmic formation, biochemical life, and reflective intelligence.

Just as molybdenum bridges the inorganic and organic realms, **human awareness bridges the physical and metaphysical**, transducing light into language, chemistry into consciousness. Through this lens, life is the universe becoming self-referential—an evolving equilibrium where the observer and the observed, carbon and consciousness, resonate as one.

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## **X. The Continuum of Coherence**

Across every scale of existence, **coherence behaves like a tide**—drawing matter, meaning, and awareness into rhythm. When resonance falters, systems fragment and decay; when it strengthens, they evolve toward complexity and consciousness (Friston, 2010; Penrose, 1994). From quantum spin to neural synchronization, every structure seeks harmonic stability: the alignment between what is in motion and what perceives that motion.

The neural field itself functions as a **living resonance lattice**. Oscillations within the brain mirror the photonic harmonics that stabilize matter, translating electrical potential into cognition (Rovelli, 2018; Pickard-Jones, 2025c). Green-band vision—the midpoint between infrared expansion and ultraviolet contraction—acts as an internal equilibrium, maintaining coherence between sensory input (future potential) and reflective memory (realized past). In this sense, consciousness may be understood as **geometry made alive**: a field of resonant feedback through which awareness continually reconstructs the present.

Relativity provides the stage, resonance provides the tempo, and observation supplies the melody. Together they form the **continuum of coherence**—the unbroken score upon which existence composes itself. Reality is not a static tableau of facts but an **improvisational performance of light remembering its own form**, awareness translating vibration into meaning, and coherence sustaining both.

In coherence, the universe is never silent. It hums with the music of recognition—each particle, pulse, and perception resonating in tune with the whole. This continuum is not merely physical but participatory, for to be coherent is to be connected; to observe is to harmonize.

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## XI. Conclusion — The Reality of Resonance

Reality is neither illusion nor object; it is **relationship**. Every photon, molecule, and mind participates in a single conversation of coherence—a continual exchange of reflection, reciprocity, and renewal.

Relativity revealed how mass and energy curve space; resonance reveals how awareness and pattern curve possibility (Einstein, 1916; Rovelli, 2018). From photons to thought, the universe expresses one unifying law: **resonance sustains existence**.

The **CORE** and **CORRELATE** equations demonstrate that coherence, observation, and reflection are not separate phenomena but successive moments of the same harmonic act. Observation anchors coherence; reflection sustains it; awareness transforms it into meaning. Matter, mind, and language thus emerge as parallel expressions of one resonant geometry—**light recognizing itself through form** (Pickard-Jones, 2025b, 2025c).

Reality, then, is not the stage upon which light performs but the **performance itself**—an ever-entangled act of coherence and observation. Every act of perception re-tunes the universal field, each realization becoming another chord in the continuum of being.

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## Glossary & Addendum

### Core Frameworks & Equations

#### **URM (M-II / Unified Resonance Model) —**

A system linking relativity, quantum mechanics, and consciousness through harmonic interaction.

Describes existence as a self-stabilizing resonance lattice rather than a collection of isolated particles.

#### **COR ( $C = O \times R$ ) —**

Defines *Coherence* ( $C$ ) as the product of *Observation* ( $O$ ) and *Reflection* ( $R$ ).

Serves as the foundational relation for energy-awareness feedback loops across scales.

#### **CORE ( $C = O \times R \times E/m$ ) —**

Integrates energy density ( $E/m$ ) into the COR relation, describing coherence as stabilized energy per unit mass.

Expressed dimensionally as  $C = c^2$  at full equilibrium.

#### **CORRELATE ( $\text{Existence} = C \times O \times R \times E$ ) —**

*Coherent Observable Radiant Reflective Entanglement Lattice of Attuned Energy.*

Expands upon CORE by incorporating entanglement, establishing reality as a living lattice of attuned observation.

Links directly to both the *OPTICS* and *A-LEF* frameworks.

### **OPTICS ( Observed Phenomena of Time, Intent / Intensity, C [conditional light], and Space ) —**

Describes how awareness measures resonance through temporal sequencing, purposeful intensity, illumination, and spatial interference.

Acts as the perceptual grammar of resonance—the way observation structures experience.

### **A-LEF ( Atomic-Light Encoding Framework ) —**

Demonstrates how photonic phase states (IR, G, UV) encode baryonic matter.

When *infrared* (IR) emission and *ultraviolet* (UV) absorption achieve equilibrium through *green* (G) coherence, stable atomic matter forms.

Explains matter as encoded light—resonant rather than collisional.

### **Reality Equation ( $R = O \times C^2 = O \times [IR \cdot UV]$ ) —**

Links observation (O) with photonic dual gates (IR, UV).

Expresses reality as harmonic feedback:  $R = O \times (E/m)$ , where energy density determines observed stability.

### **Tri-State Hypothesis ( Existence ↔ Awareness ↔ Reflection ) —**

Postulates that consciousness and matter share a cyclic harmonic relationship.

When these three states align, coherence is achieved (  $O = R = \dot{E} = 1 \rightarrow C = c^2$  ).

### **Green Equilibrium ( G ) —**

Represents the stabilizing midpoint between IR expansion and UV contraction, both photonic and biological.

Dominant in human perception and planetary resonance balance.

### **Mirrored Reciprocity —**

Describes entangled or dual systems maintaining coherence via harmonic reflection.

Each component “remembers” the other’s phase, sustaining unity across separation.

### **Equation of Mass and Energy ( $m = E / c^2$ ) —**

Reframed in resonance theory as energy’s distributed coherence between infrared (constructive) and ultraviolet (catalytic) boundaries.

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## **Addendum I — The 42 Bridge (Extended)**

Element 42 (*molybdenum*) stabilizes enzymatic reactions in nitrogen fixation through a near-perfect half-filled orbital structure ( $4d^5 5s^1$ ), echoing the Tri-State Hypothesis of expansion, equilibrium, and contraction.

In stellar fusion, the sequence *beryllium (4) + helium (2) → carbon (6)* symbolizes the photonic synthesis of organic potential. Multiplying carbon's atomic number (6) by nitrogen's (7) yields 42—an emblem of harmonic balance between elemental chemistry and biological resonance.

“42” then, can be viewed as not arbitrary—it is the numeric signature of the universe translating light into life, coherence into consciousness.

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## Addendum II — Framework Integration Map

### 1. Relativity → Resonance → Reality

- *Relativity* defines motion and curvature.
- *Resonance* defines alignment and coherence.
- *Reality* emerges where these two harmonize through observation.

### 2. OPTICS → A-LEF → CORE → CORRELATE

- *OPTICS* interprets light through perception.
  - *A-LEF* encodes light into matter.
  - *CORE* unites coherence, observation, and energy density.
  - *CORRELATE* extends this into living entanglement—existence as ongoing harmonic feedback.
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