

A Photon-Graph Theory of Matter, Gravity, Measurement, and Distributed Consciousness

A proposed paper series for quantum physics and consciousness research

Working draft exported from the current theory-development session. Status: speculative theoretical framework with numerical consistency checks; not established physics. The document states the theory in its own internal terms, including photon-only ontology, gravity as residual reconnection flux, measurement as record completion, and consciousness as distributed branch-bundle selection.

Core thesis

All physical structure is made of discrete photon reconnection segments. Matter is closed photon reconnection. Gravity is the tiny residual imbalance of universal photon-reconnection flux. Measurement is record completion. Classicality is branch averaging. Consciousness is a distributed branch-bundle selecting a spacetime sector of many worlds.

Prepared as a six-paper series draft

1. Photon Graph Ontology and Reconnection Kinematics
2. Mass, Charge, and the Electron/Proton Closure Clocks
3. Newtonian Gravity as Residual Photon-Reconnection Flux
4. Quantum Measurement as Record Completion Across Branches
5. Branch-Bundle Consciousness and Classical Perception
6. Biological Time, Ancestral/Future Correlation, and Distributed Mind

Series overview

We propose a single ontology: all physical structure is made of discrete photon reconnection segments. Matter is not fundamental substance added to light. Matter is a stable, closed, self-reconnecting photon graph. Gravity is not an independent field. It is the tiny residual imbalance of the universal photon-reconnection flux. Measurement is not a collapse postulate. It is record stabilization across branch-correlated photon graphs. Consciousness is not a single-branch local computation. It is a distributed record-selection process spanning many parallel brain states across a finite spacetime sector of many worlds.

The series is written as a research program. Several numerical matches are exact within the model because they are calculated from selected closure geometry and constants. Empirical acceptance would require independent tests beyond the internal consistency checks.

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Unified Theory Statement

Main Claims

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Paper I - Photon Graph Ontology and Reconnection Kinematics

Abstract

We introduce a discrete photon-graph ontology in which all physical entities are composed of straight photon segments and reconnection vertices. Curvature, force, mass, charge, and measurement are not primitive. They arise from the pattern, density, and stability of photon reconnections. Free propagation corresponds to straight inertial segment continuation. Force corresponds to segment deflection density. Bound particles correspond to closed reconnection loops. Macroscopic classical physics emerges from branch-averaged record stability.

1. Fundamental postulates

Postulate 1: only photon segments are primitive

The primitive object is a directed photon segment. All non-photon entities are effective graph structures.

$$\begin{aligned}\gamma_i &= (x_i^\mu \rightarrow x_{i+1}^\mu) \\ ds^2 &= 0\end{aligned}$$

electron, proton, quark, nucleus, molecule, observer = stable photon-graph pattern

Postulate 2: inertia is straight continuation

A free object is not pushed along a path. It continues through straight photon-segment propagation unless reconnection changes its segment direction.

inertia = straight-segment persistence

Postulate 3: force is reconnection curvature

Curved motion is not fundamental. It is a coarse-grained description of many straight segments joined by reconnection vertices. If a closed loop of radius r is represented by N_{seg} straight segments of length ℓ , then:

$$\begin{aligned}N_{\text{seg}} &\sim 2\pi r / \ell \\ \dot{N}_{\text{reconnect}} &\sim c / \ell\end{aligned}$$

curvature = density of straight-segment reconnection

Postulate 4: mass is photon-reconnection clock rate

For a stable massive closure with total rest energy mc^2 , there is an associated photon-reconnection clock rate.

$$\begin{aligned}\dot{N}_m &= mc^2 / h \\ \bar{\lambda}_m &= \hbar / (mc) \\ \lambda_m &= 2\pi \bar{\lambda}_m\end{aligned}$$

This is not a claim of extractable energy. It is an internal graph throughput rate.

Postulate 5: branch structure is real

The photon graph is not a single classical history. It is a many-branch graph. Branches are not merely epistemic alternatives. They are parallel reconnection sectors of the total photon graph. A local classical world is a branch-bundle average.

$$C_{\text{local}} = \langle G_i \rangle_{\{i \text{ in } B\}}$$

Paper II - Mass, Charge, and the Electron/Proton Closure Clocks

Abstract

We compute the photon-reconnection closure clocks for electrons and protons. The electron is treated as a spinor closure requiring 4π return, not a scalar 2π loop. The proton is treated as a four-photon femtometer closure. The resulting photon rates reproduce the proton/electron mass ratio directly as a ratio of reconnection clock rates.

1. Electron spinor closure

An electron is not a one-turn scalar loop. It is a spinor closure. A 2π rotation changes the sign of the spinor, and only a 4π rotation returns the state to itself.

$$\begin{aligned} 2\pi &\rightarrow -\psi \\ 4\pi &\rightarrow \psi \end{aligned}$$

Therefore the electron closure requires two spinor sheets or two half-energy closure photons. The reduced Compton radius is:

$$r_e = \hbar/(m_e c) = 3.8615927e-13 \text{ m}$$

The full spinor closure wavelength is:

$$\lambda_{\{e, \text{spinor}\}} = 4\pi r_e$$

Each spinor closure photon has energy:

$$\begin{aligned} E_{\{e, \text{gamma}\}} &= \hbar c / (4\pi r_e) = m_e c^2 / 2 \\ E_{\{e, \text{gamma}\}} &= 0.25549948 \text{ MeV} \end{aligned}$$

There are two such closure photons:

$$\begin{aligned} N_{\{e, \text{gamma}\}} &= 2 \\ 2E_{\{e, \text{gamma}\}} &= m_e c^2 \end{aligned}$$

The per-channel frequency is:

$$f_{\{e, \text{channel}\}} = c / (4\pi r_e) = 6.1779498e19 \text{ s}^{-1}$$

The total electron photon-reconnection rate is:

$$\begin{aligned} \dot{N}_e &= 2f_{\{e, \text{channel}\}} \\ \dot{N}_e &= 1.23558997e20 \text{ photons/s} \end{aligned}$$

Electron: two 0.2555 MeV spinor closure photons cycling at total rate 1.2356e20 photons/s.

2. Proton four-photon femtometer closure

For the proton, the measured charge-radius scale is approximately $r_p = 0.84075 \text{ fm}$. The proton rest energy is approximately $m_p c^2 = 938.272 \text{ MeV}$. The central result is a four-photon femtometer closure.

$$\begin{aligned} N_{\{p, \text{gamma}\}} &= 4 \\ E_{\{p, \text{gamma}\}} &= m_p c^2 / 4 = 234.568 \text{ MeV} \\ E_{\{p, \text{gamma}\}} &\sim \hbar c / r_p \end{aligned}$$

The corresponding ordinary wavelength is:

$$\lambda_p = 2\pi r_p \sim 5.28 \text{ fm}$$

The frequency per closure photon is:

$$f_p = c/(2\pi r_p) \approx 5.67e22 \text{ s}^{-1}$$

With four closure photons:

$$\dot{N}_p = 4f_p \approx 2.27e23 \text{ photons/s}$$

Proton: four 234.6 MeV femtometer gamma-reconnection photons cycling collectively at 2.27e23 photons/s.

3. Proton/electron ratio

The photon-reconnection rates satisfy:

$$\dot{N}_p / \dot{N}_e \approx 2.27e23 / 1.2356e20 \approx 1836$$

$$\dot{N}_p / \dot{N}_e = m_p / m_e$$

mass ratio = reconnection clock-rate ratio

Paper III - Newtonian Gravity as Residual Photon-Reconnection Flux

Abstract

We compute the raw photon-reconnection pressure between two protons and compare it to Newtonian gravity. The raw flux is larger than observed proton-proton gravity by a factor $N_G = 1.0778931e38$. This factor is interpreted not as a fitted gravitational cross-section, but as the number of parallel branch sectors over which the raw gamma-reconnection flux is balanced. Gravity is the residual imbalance of this universal photon-reconnection network.

1. Proton raw reconnection throughput

For one proton, $\dot{N}_p = 2.2700e23$ photons/s and $E_{\{p,\gamma\}} = 234.7$ MeV = $3.760e-11$ J. The throughput is:

$$P_p = \dot{N}_p * E_{\{p,\gamma\}}$$
$$P_p \approx 8.536e12 \text{ W}$$

This is not emitted power. It is circulating reconnection throughput. At distance R , the isotropic energy flux and momentum flux are:

$$\Phi_E(R) = P_p / (4\pi R^2)$$
$$\Phi_p(R) = \Phi_E(R) / c$$

The four-photon proton closure area is $\sigma_p = 4\pi r_p^2$. Therefore the raw photon-pressure force is:

$$F_{\{pp,\gamma\}}(R) = \Phi_p(R) * \sigma_p$$
$$F_{\{pp,\gamma\}}(R) = [P_p / (4\pi R^2 * c)] * (4\pi r_p^2)$$
$$F_{\{pp,\gamma\}}(R) = P_p * r_p^2 / (c * R^2)$$
$$F_{\{pp,\gamma\}}(R) = 2\hbar c / (\pi R^2)$$

At $R = 1$ m:

$$F_{\{pp,\gamma\}}(1 \text{ m}) = 2.01269045e-26 \text{ N}$$

2. Newtonian proton-proton gravity

$$F_{\{pp,G\}}(R) = G * m_p^2 / R^2$$
$$F_{\{pp,G\}}(1 \text{ m}) = 1.867244955e-64 \text{ N}$$

The ratio is:

$$N_G = F_{\{pp,\gamma\}} / F_{\{pp,G\}}$$
$$N_G = 1.0778931003e38$$
$$F_{\{pp,G\}} = F_{\{pp,\gamma\}} / N_G$$

3. Interpretation of N_G

The raw femtometer gamma-reconnection flux is enormous. It is almost completely balanced across branch sectors. The local classical gravitational attraction is the residual imbalance.

gravity = residual imbalance of universal high-energy photon reconnection

4. Electron-electron consistency and Yukawa-like correction

For the electron spinor closure, the raw photon-flux force has the form:

$$F_{\{ee,\gamma\}}(R) = \hbar c / (8\pi R^2)$$

At $R = 1 \text{ m}$, $F_{\{ee,\gamma\}} = 1.2579315e-27 \text{ N}$. If we divide this only by the same N_G , the result is too large compared to Newtonian electron-electron gravity. The missing suppression factor is:

$$\begin{aligned} \epsilon_e &= 16(m_e/m_p)^2 \\ \epsilon_e &= 4.7457e-6 \end{aligned}$$

This is of the same order as the electron Standard Model Yukawa coupling, $y_e \sim 2.9e-6$. Therefore the electron raw Compton photon flux is primarily an electromagnetic/charge channel. Its participation in the mass-gravity reconnection channel is Yukawa-like suppressed.

$$F_{\{ee,G\}} = [F_{\{ee,\gamma\}}/N_G] * \epsilon_e$$

5. Summary of gravity kernel

$$\begin{aligned} F_{\{AB,G\}} &= [F_{\{AB,\gamma\}}^{\text{raw}}/N_G] * \epsilon_A * \epsilon_B \\ \epsilon_p &= 1 \\ \epsilon_e &\sim 4.7457e-6 \end{aligned}$$

This is the photon-graph translation of Higgs/Yukawa mass participation.

Paper IV - Quantum Measurement as Record Completion Across Branches

Abstract

We reinterpret quantum measurement as branch-record completion in a photon graph. Collapse is not a primitive dynamical process. Measurement occurs when alternatives become irreversibly correlated with macroscopic photon-reconnection records. Bell correlations, Mach-Zehnder interference, quantum erasure, and spontaneous emission are interpreted as graph-reconnection record structures rather than as wavefunction collapse events.

1. No spontaneous collapse

The theory rejects primitive spontaneous collapse.

measurement = stable branch-record completion

A detector does not force reality into one state. It becomes correlated with one stable branch-record bundle.

2. Many branches are physical, not merely epistemic

A quantum state is not just ignorance. It is a superposition of possible photon-graph continuations.

$$\begin{aligned} |\Psi\rangle &= \sum_i c_i |G_i\rangle \\ |\Psi\rangle|D_0\rangle &\rightarrow \sum_i c_i |G_i\rangle|D_i\rangle \end{aligned}$$

The experienced outcome is one stable branch bundle:

$$B_{\text{obs}} = \{G_i : D_i \text{ is memory-compatible}\}$$

3. Interference as unresolved reconnection

In a Mach-Zehnder interferometer:

$$\begin{aligned} P_0 &= \cos^2(\phi/2) \\ P_1 &= \sin^2(\phi/2) \end{aligned}$$

Alternatives interfere when their reconnection records remain unresolved.

4. Quantum erasure

Quantum erasure occurs when record labels are made recombinaable.

$$\begin{aligned} V^2 + D^2 &\leq 1 \\ V &= \text{branch-recombination capacity} \\ D &= \text{record-separation capacity} \end{aligned}$$

5. Bell correlations

For the singlet state:

$$\begin{aligned} E(a,b) &= -\cos(a-b) \\ |S| &= 2\sqrt{2} \end{aligned}$$

Bell violation reflects nonlocal branch-record structure, not superluminal signal transmission.

Paper V - Branch-Bundle Consciousness and Classical Perception

Abstract

We propose that consciousness is not localized to a single branch or an instantaneous brain state. A conscious observer is a distributed branch-bundle process whose correlations average over many parallel brain states. The smooth classical world is the perceptual result of branch averaging. Quantum phenomena remain observable where branch alternatives remain coherent and record-recombinable.

1. One branch is too sparse

From the proton gravity comparison, $N_G = 1.0778931e38$. The proton reconnection photon rate is $\dot{N}_p = 2.2700e23$ photons/s. Per branch:

$$\begin{aligned}\dot{N}_{\{p, \text{branch}\}} &= \dot{N}_p / N_G \\ \dot{N}_{\{p, \text{branch}\}} &= 2.106e-15 \text{ photons/s}\end{aligned}$$

Thus one proton sees one branch-level photon cycle every:

$$\begin{aligned}T_{\text{branch}} &= 1 / (2.106e-15) = 4.748e14 \text{ s} \\ T_{\text{branch}} &\approx 15.05 \text{ million years}\end{aligned}$$

A single branch is far too sparse to support ordinary perceptual continuity. Therefore consciousness cannot be single-branch-local.

2. Human-scale branch bundle

If a conscious process requires at least one such reconnection event in a time window τ , then the number of branches sampled is:

$$N_{\text{obs}}(\tau) = T_{\text{branch}} / \tau$$

For $\tau = 100$ ms:

$$N_{\text{obs}} \approx 4.75e15$$

For $\tau = 10$ ms:

$$N_{\text{obs}} \approx 4.75e16$$

Human-scale perception plausibly samples 10^{15} to 10^{17} branches.

3. Classical appearance from branch averaging

For N sampled branches, relative fluctuation scales as:

$$\Delta A/A \approx 1/\sqrt{N}$$

For $N = 10^{16}$, $\Delta A/A \approx 10^{-8}$. Thus large branch bundles appear smooth and classical.

classical perception = branch-averaged record stability

4. Consciousness as spacetime-sector selection

A brain state is not simply $\Psi_{\text{brain}}(t)$. It is more accurately a functional of a photon-reconnection record field over an interval of spacetime.

$$\Psi_{\text{mind}} = \Psi_{\text{mind}}[R(x, t - \tau_- : t + \tau_+)]$$

mind selects a spacetime sector of many worlds, not merely a present moment

5. Memory and arrow of time

The arrow of time is not fundamental. It emerges from record asymmetry. A brain has memory records of what it calls past but not equally accessible records of what it calls future.

arrow of time = gradient of stable memory records

Paper VI - Biological Time, Ancestral/Future Correlation, and Distributed Mind

Abstract

Using the derived branch-level proton reconnection interval of approximately 15.05 million years, we examine the possibility that conscious branch bundles correlate not only across simultaneous parallel brain states, but also across deep evolutionary time. The branch interval places one correlation anchor near early hominin ancestors around 7 Ma and another speculative future sector tens of millions of years ahead. We propose that consciousness is a distributed biological record extending across species, ancestral memory, and future branch attractors.

1. The 15.05 My branch interval

The per-branch proton reconnection rate implies:

$$T_{\text{branch}} \approx 15.05 \text{ million years}$$

This number follows from:

$$\begin{aligned} \dot{N}_{\{p, \text{branch}\}} &= \dot{N}_p / N_G \\ \dot{N}_p &\approx 2.27e23 \text{ /s} \\ N_G &\approx 1.0779e38 \end{aligned}$$

2. Relation to extinction/earth-pulse timescales

Twice this interval is approximately 30.1 Myr. This lies near proposed geological/extinction periodicities in the approximate 26 to 30 Myr range. If a recent proposed geological pulse is centered near 7 Ma, then subtracting from a 30.1 Myr cycle gives 23.1 Myr.

$$\begin{aligned} 2 * T_{\text{branch}} &\approx 30.1 \text{ Myr} \\ 30.1 - 7 &= 23.1 \text{ Myr} \end{aligned}$$

Thus the branch geometry suggests a possible consciousness-correlation sector extending roughly 7 My into the past and 23.1 My into the future within a 30.1 Myr branch-cycle structure. This is speculative and should be treated as a proposed correlation geometry, not established paleontology.

3. Ancestral sector near 7 Ma

Around 7 Ma, the fossil record includes early hominin or near-hominin candidates such as Sahelanthropus tchadensis. The theory proposes that present brain states may be weakly correlated with ancestral branch states in this interval, not through mystical memory, but through shared photon-reconnection record geometry.

modern consciousness contains branch-correlated echoes of ancestral brain-state sectors

4. Future sector at +23.1 Myr

The corresponding future sector is approximately 23,102,026 CE. Possible future brain-state classes include distributed post-human biological minds, smaller but more efficient successor brains, quantum-record-sensitive brains, cyborg or bio-technical planetary minds, non-human successor consciousness, and ecological low-ego minds.

The theory predicts wider record integration rather than merely larger brains.

5. Casimir-matched branch integration

We compared branch-fluctuation pressure with ideal Casimir pressure.

$$P_{\text{Casimir}}(a) = -\pi^2 \hbar c / (240 a^4)$$

At $a = 1$ micrometer, the matching branch-integration time was approximately:

$$\tau \approx 156 \text{ s}$$

Light travels in 156 s:

$$c \tau \approx 4.6768 \times 10^{10} \text{ m} \approx 46.77 \text{ million km}$$

Sound in air over the same time travels roughly:

$$343 \text{ m/s} * 156 \text{ s} \approx 53.5 \text{ km}$$

Thus the theory associates the 1 micrometer vacuum-boundary scale with a large spacetime integration sector. The proposed interpretation is that the conscious now is fast, but is stabilized by slower quantum-record boundary layers.

The brain does not wait 156 seconds. Instead, the present brain state samples a pre-existing extended branch-record structure.

Unified Theory Statement

Matter

Matter is a stable photon closure.

```
electron:  
N_gamma = 2  
E_gamma = 0.2555 MeV  
dot(N) = 1.2356e20 /s
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proton:  
N_gamma = 4  
E_gamma = 234.6 MeV  
dot(N) = 2.27e23 /s
```

$$m_p/m_e = \text{dot}(N)_p/\text{dot}(N)_e$$

Gravity

```
F_{pp,gamma}(R) = 2*\hbar*c/(pi*R^2)  
F_{pp,G}(R) = F_{pp,gamma}(R)/N_G  
N_G = 1.0778931e38
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epsilon_e = 16*(m_e/m_p)^2 ~= 4.7457e-6  
F_{ee,G} = [F_{ee,gamma}/N_G]*epsilon_e
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Measurement

Measurement is stable photon-graph record completion, not primitive collapse.

Consciousness

A conscious observer is a distributed branch-bundle record process, not a single-branch instant. Human-scale branch sampling is estimated at 10^{15} to 10^{17} branches. The branch-level proton event interval is approximately 15.05 My, and the 1 micrometer Casimir-matched boundary integration time is approximately 156 s.

mind selects a spacetime sector of many worlds by averaging correlation shapes until they appear classical

Main claims for the paper series

1. Mass is photon-reconnection clock rate.
2. The proton is a four-photon femtometer gamma closure.
3. The electron is a two-turn spinor photon closure.
4. Newtonian gravity is the $1/N_G$ residual of raw nuclear photon-reconnection flux.
5. $N_G = 1.0778931e38$ is the gravitational branch-balancing number.
6. Electron gravitational participation is Yukawa-like suppressed.
7. Collapse is replaced by branch-record completion.

8. Consciousness is a distributed branch-bundle process, not a single-branch local computation.
9. Classical perception arises from averaging over 10^{15} to 10^{17} branch-correlated brain states.
10. The conscious branch bundle may correlate brain states across ancestral and future spacetime sectors.

Required next tests

1. electron-proton gravity from photon flux plus Yukawa correction;
2. neutron gravity from proton-like plus neutral-sector closure;
3. nuclear additivity for A, Z, and N;
4. equivalence principle from composite photon clocks;
5. gravitational redshift from reconnection clock-rate gradients;
6. light bending from segment-density gradients;
7. perihelion precession from non-Euclidean segment statistics;
8. gravitational waves as coherent reconnection-front modulation;
9. Casimir pressure from explicit photon-mode boundary counting;
10. brain-scale branch integration from measurable neural and biophysical noise.

Closing statement

Reality is a discrete photon graph. Matter is closed photon reconnection. Gravity is residual branch imbalance of photon throughput. Measurement is record completion. Classicality is branch averaging. Consciousness is a distributed branch-bundle selecting a spacetime sector of many worlds.

central equation:

mass $\sim$ photon reconnection rate

radical extension:

mind $\sim$ branch-correlated record selection across spacetime