1 ODTOE — Observer-Dependent Theory of Everything

1.1 Simple Explanation

1.2 What is ODTOE?

ODTOE (Observer-Dependent Theory of Everything) is a theory in which the observer does not simply watch reality but participates in its creation. Reality does not exist in finished form "somewhere out there"—it arises at the moment of observation.

The central formula of the theory:

$R = \hat{O}(\Psi)$

Here: - **Ψ** — field of all possible states (everything that *can* be) - **$\hat{O}$** — observation operator (the act of observation itself) - **R** — observed reality (that which *became* concrete)

Analogy: imagine a film projector. The film contains all frames (this is Ψ), the projector selects and displays one frame (this is $\hat{O}$), and the image on the screen is R.

1.3 Three Mandatory Participants

In ODTOE, any observation requires exactly three components:

1. **Observer (O)** — the one who looks
2. **Observation operator ($\hat{O}$)** — the very process of observation
3. **Observed reality (R)** — the result

These three elements form a closed loop: the observer initiates observation, observation creates reality, reality influences the observer in return. This is called a *strange loop*—a system that generates itself.

Why exactly three? The theory links this to the number π: Archimedes proved that $\pi > 3$, meaning that to close a loop one needs strictly more than three elements. Three is the minimum at which the loop can exist.

1.4 Belief as a Measurable Quantity

In ODTOE, "belief" is not a religious feeling or emotion. It is a measurable degree of internal coherence between the observer and what he observes. Denoted **B** and depends on four components:

- **F** — focus of attention (how concentrated the observer is)
- **E** — emotional coherence (how feelings align with intention)
- **σ** — internal contradiction (doubts, conflict)
- **Λ** — experiential reinforcement (accumulated experience confirming the observation)

Formula: $\mathbf{B = F^{w_1} \cdot E^{w_2} \cdot (1-\sigma)^{w_3} \cdot \Lambda^{w_4}}$

Important property: if even one of the four components equals zero, all belief becomes zero. This means one cannot compensate for a complete lack of attention with an excess of emotion or vice versa.

1.5 Coherence and Inertia

1.5.1 Coherence (S)

When several observers look at the same thing, their observations may be aligned (all see the same thing) or misaligned (each sees their own). The degree of alignment is called *coherence* and denoted **S**.

- **S = 0** — complete misalignment (each in their own reality)
- **S = 1** — complete alignment (all see the same thing)

A fundamental result of the theory: **S = 1 is unattainable**. The strange loop is structurally incomplete—the spiral never closes into a circle exactly; there is always a gap. This very gap generates the flow of time.

1.5.2 Inertia (I)

The more observers agree that a certain configuration is real, the harder it is to change it. This is inertia. The rate of change of reality is inversely proportional to inertia:

$\mathbf{v = \alpha / (I + \varepsilon)}$

A stone is hard to move because many observers (including all atoms of the stone—they too are observers in ODTOE) consistently “believe” in its position.

1.6 Where Does Time Come From?

In conventional physics, time is a given coordinate. In ODTOE, time *emerges* from the properties of the strange loop.

Each cycle of observation is one “step”:

$\Psi_0 \to \Psi_1 \to \Psi_2 \to \Psi_3 \to \dots$

If the loop closed exactly (S = 1), the system would return to its initial state and there would be no time. But the loop does not close—each turn deviates by an amount related to $(\pi - 3) \approx 0.14159$. We get not a circle but a spiral.

It is the spiral nature of the loop that creates: - **Discrete time** — the iteration number n - **Arrow of time** — the spiral unwinds only in one direction - **Irreversibility** — past and future are not symmetric

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1.7 The Number π as a Fundamental Constant

The theory shows that π emerges not by chance but as an inevitable consequence of self-observation. Five independent arguments:

1. **Topology**: closed loop on a circle → length = 2π
2. **Spectral**: oscillations of the system have period T = 2π/ω
3. **Statistical**: normalization of Gaussian distribution requires factor √(2π)
4. **Dynamic**: coupled oscillations of R and B give period 2π
5. **Algebraic**: Euler’s identity e^(iπ) + 1 = 0 connects all key constants

The transcendence of π (it cannot be expressed through fractions and roots) means that the spiral will never close. This is the mathematical reason for time’s irreversibility.

1.8 Golden Ratio φ as a Second Invariant

Along with π, the theory produces the golden ratio **$\varphi = (1+\sqrt{5})/2 \approx 1.618$**.

- **π** governs continuous phase dynamics (rotation, waves)
- **φ** governs discrete recursive structures (sequences, branching)

Both numbers are consequences of self-reference: π emerges in continuous self-observation, φ in discrete self-observation (through the mapping f(x) = 1 + 1/x, whose fixed point equals φ).

1.9 Atoms as Observer Triads

The theory offers a new view of atomic structure. Three subatomic particles correspond to the three elements of the strange loop:

Particle	Role in ODTOE	Charge
Proton	Observable R (that which became concrete)	+1
Electron	Observation operator $\hat{O}$ (projection function)	−1
Neutron	Observer O (initiating the cycle)	0

From this follow explanations:

- **Charge conservation**: (−1) + (+1) + 0 = 0 — balance is embedded in the loop structure
- **Electron has no precise position**: it is not a particle with coordinates but a function (operator), so its "location" is the domain of action, not a point
- **Proton is stable**: it is a component of a stable fixed point Ψ*
- **Free neutron decays**: an isolated observer without a closed loop cannot exist self-consistently → it is forced to "actualize" → decay $n \to p + e + \bar{\nu}_e$
- **Antineutrino**: manifestation of the structural incompleteness of the loop (that very gap)

1.9.1 Recursion Inward

Each level contains a triad that itself consists of triads:

- **Level −1**: quarks ↔ gluons (u-quark, gluon, d-quark)
- **Level 0**: atom (proton, electron, neutron)
- **Level +1**: molecules (atoms connected by chemical bonds)

This continues in both directions to infinity—self-similarity at all scales.

1.10 Electricity as the Action of the Observer

In ODTOE, electric current is not the movement of particles but a coherent drift of operator projections. When local self-consistency Ψ* is disrupted, the operator redistributes its projections to restore equilibrium—and this is perceived as electric current.

- **Electron** — direct action of operator $\hat{O}$ (charge −1)
- **Positron** — reverse action of operator ι (charge +1)

- **Neutral particle** — initiation without transfer (charge 0)

Maxwell's equations in this interpretation are not fundamental laws but conditions of self-consistency of the mapping Φ.

The symmetry U(1) (gauge symmetry of electromagnetism) follows from the phase invariance of observation: rotation of phase Ψ by an arbitrary angle θ does not change the observation result. Topologically, the strange loop is equivalent to the circle S^1, and the integrality of charge follows from $\pi_1(S^1) = Z$.

1.11 Information and Memory

1.11.1 Film and Screen

ODTOE distinguishes two spaces:

- **H** (space of potential states) — "film" containing all possible frames
- **C** (configuration space) — "screen" showing one frame at the moment

Information is not stored somewhere separately—it is the structure of H itself. Just as the number π is not written in any file but is a property of the ratio of a circle's circumference to its diameter.

1.11.2 World Line

The sequence of all the observer's "frames" forms a world line:

W = {Ψ*_n}, n Z

Key thesis: the world line exists wholly, not frame by frame. "Past," "present," and "future" are simply different cuts of one and the same curve in H.

This explains Kozyrev's experiments: the telescope fixes three positions of the star (past, present, and future) because all three are really existing parts of the world line.

1.11.3 Observer's Window

The observer sees not the entire world line but only a limited "piece" of width Δn:

- **Ordinary human**: $\Delta n \approx 1$ (sees only the current "frame")
- **Memory**: $\Delta n \sim 10^2$ (access to past frames)
- **Kozyrev mode**: $\Delta n \geq 3$ (past, present, and future are visible)
- **Limit**: $\Delta n \to \infty$ (full access to the world line)

1.11.4 Information is Not Destroyed

Since H constitutes itself through the act of observation, information cannot be destroyed. Black holes are configurations with limiting inertia I(C) → 1, and Hawking radiation is the manifestation of the spiral gap δΨ gradually releasing "trapped" information.

1.12 Multiplicity of Realities

ODTOE predicts that the number of coexisting realities depends on the coherence of observers:

- At complete misalignment (S → 0): number of realities |M| → ∞
- At complete alignment (S → 1): reality tends toward uniqueness

This explains why we see one "objective" reality: the high coherence of an enormous number of observers (including all particles of matter) stabilizes one configuration. But complete unity (S = 1) does not exist—therefore, quantum fluctuations, uncertainty, and the probabilistic nature of the microworld exist.

1.13 The Problem of the First Observer

If reality is created by the observer, who created the first observer?

ODTOE resolves this paradox through a *fixed point*. The self-observation mapping Φ(Ψ) = ι(Ô_Ψ(Ψ)) has a fixed point:

Ψ* = Φ(Ψ*)

This is a configuration that generates the observer who constitutes this very same configuration. The system creates itself—without an external "creator" and without an infinite chain of causes.

The existence of such a point is guaranteed by Banach's fixed-point theorem.

1.14 Connection to Known Theories

Theory	What ODTOE Takes
Copenhagen Interpretation	Role of observer in wave function collapse
Many-Worlds Interpretation (Everett)	Multiplicity of realities as observer branching

Theory	What ODTOE Takes
General Relativity	Spacetime geometry is modified by coherence structure
QBism	State of a system as observer's subjective expectation
Relational QM (Rovelli)	All properties are relative to the observer
Causal Mechanics (Kozyrev)	Active properties of time, spiral dynamics
Paradigm Shifts (Kuhn)	Different coherence states = different "theories" simultaneously valid

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1.15 Four Main Assertions

1. **Plurality**: With observer misalignment, the number of valid "theories of everything" tends to infinity. With complete coherence—toward unity.
2. **Convergence of laws**: Physical laws are not fixed—they depend on coherence. At $S \to 1$, laws tend toward a single set; at $S \to 0$, they proliferate.
3. **Structural incompleteness**: Complete coherence ($S = 1$) is unattainable. The strange loop always remains a spiral. Consequences: arrow of time, transcendence of π, impossibility of "final theory."
4. **Self-generation**: There exists a fixed point Ψ^*, solving the problem of the first observer without external causality.

1.16 Coherent Conductivity Resonator (CCR)

The theory proposes the concept of a new device—CCR. The idea: if electricity is the action of the observation operator, then we can organize a coherent flow of operator projections in a conductor using terahertz emitters in a triple configuration with spiral phase correction:

$\delta_\pi = 2\pi(\pi-3)/3 \approx 0.297$ rad

This correction compensates for the spiral gap and allows coherence to approach the threshold of a self-sustaining mode.

1.17 Summary

ODTOE is a metatheoretical framework in which:

- **Observation** — not passive registration but a constructive act generating reality

- **Triad** (observer, observation, observed) — minimal unit of being
- **Strange loop** — fundamental structure from which time, charge, mass follow
- **π and φ** — not random numbers but inevitable structural invariants of self-observation
- **Information** — not stored or destroyed but is the structure of the field of potential states
- **Physical laws** — not absolute but depend on the degree of observer alignment