

# Before the Metrics:

## The Observer’s Dilemma and the Conceptual Origin of the UAT/UCP Framework

Miguel Ángel Percudani

Independent Researcher, Puan, Buenos Aires, Argentina

miguel.percudani@yahoo.com.ar

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### Abstract

Every physical theory begins not with an equation, but with a question. This document records the question that gave birth to the UAT/UCP framework — a question that arose not from a disagreement with existing data, but from a discomfort with the position of the observer who collects it. If different species perceive the passage of time at demonstrably different rates, then any measurement of a physical constant that depends on time is filtered through the biology of the measurer. This simple observation led to a deeper inquiry: can we construct a metric that does not depend on the biological clock of the observer, but only on the geometric structure of the causal membrane that separates potentiality from actuality? This note is not a validation of the UAT/UCP framework; it is a record of the conceptual seed from which the entire programme grew.

## 1 The Fly and the Physicist

In 2013, researchers at Trinity College Dublin demonstrated that smaller animals with faster metabolic rates perceive time at a finer temporal resolution [1]. The common housefly (*Musca domestica*), with a visual flicker-fusion frequency of approximately 200–250 Hz, samples reality roughly four times faster than a human being, whose visual system saturates at around 50–60 Hz.

This is not a metaphor. It is a quantitative, experimentally verified difference in the **sampling rate** of sensory information. The fly does not live in a different universe; it lives in the same universe, but it takes four temporal “frames” for every one that we take.

Now imagine —as a thought experiment— that the fly were to formulate the laws of physics. It would build instruments calibrated to its own neural clock. It would define a “second” based on its own flicker-fusion cycle. It would measure the speed of light using those units. The numerical value it would obtain would be approximately **four times larger** than the human value of  $c \approx 3.00 \times 10^8$  m/s — not because light travels faster for the fly, but because the fly’s unit of time is four times finer.

Both measurements are correct within their respective frames. Neither is absolute. The constant  $c$  is not a property of light alone; it is a property of the **interaction** between light and the clock that measures it.

## 2 The Uncomfortable Question

This biological relativity is not confined to the speed of light. Any physical phenomenon that involves time—which is to say, **all** physical phenomena—is measured against a clock. If the clock ticks differently for different observers, then the numerical values we inscribe in textbooks are not properties of the universe alone; they are properties of the observer-universe pair.

This led to an uncomfortable question:

*If our fundamental constants depend on how we measure time,  
and if how we measure time depends on our biology,  
then what is the real time of the universe?  
And can we construct a physics that does not care who is asking?*

This was the question that preceded all the equations. Before  $R_{\text{geom}}$ , before  $k_{\text{early}}$ , before the Ivancho limit, there was this: the suspicion that the “weirdness” of quantum mechanics—the superpositions, the measurement problem, the apparent indeterminacy—was not a feature of reality, but an artefact of our own limited sensory bandwidth.

The housefly, with its faster neural clock, would observe quantum events with a temporal resolution four times finer than ours. What appears to us as a particle being in two places at once might appear to the fly as a perfectly deterministic sequence of discrete states. The fly does not see magic. It sees causality.

## 3 The Seed of the Metrics

The UAT/UCP framework [2, 3] was the attempt to answer that question. It does not take the human second or the human metre as fundamental. Instead, it anchors physical law to a geometric structure—the causal membrane—and to constants that are derived from the interference of eight phase fronts, not from the flicker-fusion rate of a primate’s retina.

The constants  $R_{\text{geom}} = 0.2792$ ,  $k_{\text{early}} = 0.967$ , and the Ivancho limit  $\kappa_{\text{crit}} = 4.978$  are not measured against a human clock. They are measured against the geometry of the filter that separates the unmanifested potential (Bit 0) from observable reality (Bit 1). They are, in this sense, **observer-independent**.

The framework does not claim to have eliminated the observer entirely — no physical theory can. But it attempts to shift the point of reference from the biology of the measurer to the structure of the membrane that makes measurement possible.

## A Speculative Calculation: The Frequency of the Membrane

We may push this reasoning to its logical limit. If the causal membrane processes information at a characteristic frequency, then an observer capable of sampling at that frequency would perceive the quantum world as fully deterministic — without superpositions, without collapse, without indeterminacy.

The UAT/UCP framework predicts the QCD confinement scale as  $M_{\text{obs}}(4) = 215.6 \text{ MeV}$  [2]. This energy scale corresponds to a characteristic frequency via the Planck–Einstein relation:

$$f_{\text{QCD}} = \frac{E}{h} = \frac{215.6 \times 10^6 \text{ eV} \times 1.602 \times 10^{-19} \text{ J/eV}}{6.626 \times 10^{-34} \text{ J}\cdot\text{s}} \approx 5.21 \times 10^{22} \text{ Hz}. \quad (1)$$

This frequency — $5.21 \times 10^{22}$  Hz— is the “clock speed” at which the membrane operates at the scale of the strong nuclear force. A hypothetical observer sampling at this rate would see the subatomic universe as clearly as we see a falling apple: deterministic, causal, and free of quantum ambiguity.

**This is a speculative calculation.** It is not a prediction of the UAT/UCP framework, nor does it imply that such an observer could ever be constructed — the energies required to resolve individual events at this frequency lie far beyond current technology. Its purpose is solely to illustrate the instrumental limitation that the framework seeks to overcome: any finite sampling rate introduces a bias. The solution is not to accelerate the sampling indefinitely, but to construct a metric that does not depend on the sampling rate at all. That is what the UAT/UCP constants are designed to provide.

A simple Python script illustrating the effect of sampling rate on the perception of a quantum event is provided as supplementary material to this note.

## 4 A Note on the Nature of This Document

This is not a scientific paper. It contains no new results, no data, no statistical tests. It is an **antalogy**: a record of the conceptual seed from which the UAT/UCP framework grew. It is placed in the public domain so that those who encounter the metrics may understand the question that gave rise to them.

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*Every equation is an answer.  
This is the question that came first.*

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## References

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- [2] M. A. Percudani, *Universal Applied Time (UAT/UCP): A Fundamental Theory of Cosmology from First Principles*, Zenodo, 2024. DOI: [10.5281/zenodo.17729221](https://doi.org/10.5281/zenodo.17729221).
- [3] M. A. Percudani, *The Causal Coherence Constant  $\kappa_{\text{crit}}$ : A Fundamental Limit on Retrocausal Influence*, Zenodo, 2024. DOI: [10.5281/zenodo.18210808](https://doi.org/10.5281/zenodo.18210808).