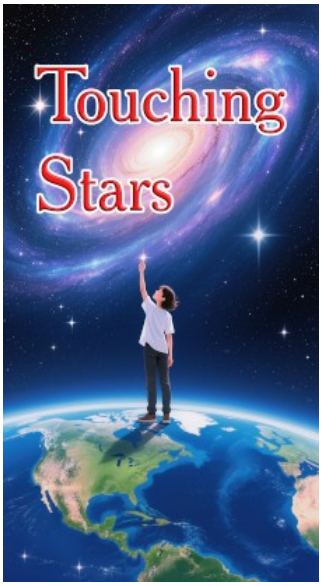
Touching Stars



On the Nature of Light, Connection, and Observation

A Contemplation Arising from the Transaction-Geometric Interpretation

by Ivars Vilums, January 2026

The Question That Haunted Physics

For over a century, physics has grappled with a seemingly simple question about light: what is waving?

When we describe light as a wave, we naturally ask about the medium. Water waves require water. Sound waves require air. What do light waves require? The nineteenth century proposed the luminiferous aether—a substance pervading all space through which light propagated. The Michelson-Morley experiment of 1887 found no evidence for this aether. Physics concluded: light needs no medium. It simply travels through empty space.

But this answer, though successful, left the question unanswered. If nothing is waving, how can light be a wave? We developed quantum mechanics and learned that light is also particles—photons. But photons that somehow interfere like waves. The mystery deepened rather than resolved.

The Transaction-Geometric Interpretation offers an answer so simple it is almost shocking: nothing is waving because nothing is traveling.

Light Does Not Travel

In the standard view, a photon is emitted by a source, travels through space at velocity c, and is absorbed by a detector. We measure the speed of light. We calculate travel times. We design systems based on propagation delays. And it all works with extraordinary precision.

But consider what we actually observe. We observe emission events—a source producing light. We observe absorption events—a detector registering light. We observe correlations between them consistent with a speed c. We never observe light in transit. We cannot intercept a photon "in flight" and examine it without absorbing it, without terminating its supposed journey.

The Transaction-Geometric Interpretation proposes that there is no journey. What we call a photon is not an object traveling from emission to absorption. It is our observational perspective on a direct geometric connection—a transaction—

simultaneously in zero time and space between the emission event and the absorption event. The transaction has endpoints. The photon path is just the view of that connection from our perspective.

The transaction connects emission and absorption with no intervening journey—a geometric short-circuit across the block universe, collapsing what we perceive as vast distances and eons into a single, instantaneous link. The photon IS the wormhole. The "speed of light" is not a velocity; it is the geometric relationship between space and time coordinates in our universe's compactified structure.

The wave description remains mathematically valid. Maxwell's equations still work. But what they describe is not something propagating through space. They describe the constraints on how transaction endpoints can relate to each other given the underlying geometry. Interference patterns arise not from waves overlapping in space but from the superposition of potential transactions before one is actualized.

What is waving? Nothing. There is nothing to wave because there is nothing traveling. The wave formalism describes the geometry of connection, not the motion of a thing.

Observation as Direct Connection

This reframes what observation means.

In the standard picture, when you see a candle flame, photons leave the flame, travel through the intervening space, and arrive at your retina. You receive information that has been transported across a gap. The candle is there; you are here; something crossed the distance between.

In the transaction-geometric picture, there is no gap to cross. The flame and your retina form linked endpoints in a transaction. The connection is direct. What you experience as "seeing the flame" is the actualization of a geometric link between your eye and the fire. You do not receive something from the flame. You and the flame become connected nodes in the transaction network.

This is not metaphor. This is not saying you are "spiritually connected" to what you observe while remaining physically separate. The transaction IS the physics. The link in the underlying geometry IS what we call the photon. To observe is to form a direct connection.

Every photon you have ever "received" was a direct connection to its source. The candle flame. A loved one's face. The page of a book. The screen before you now. You did not receive information from these sources—you formed transaction endpoints with them. You touched them.

Touching Stars

Look at the night sky.

The Andromeda galaxy is 2.5 million light-years away. In the standard picture, the light you see left Andromeda 2.5 million years ago and has been traveling through space ever since, finally arriving at your eye tonight. The distance is almost inconceivable. The isolation is profound. You observe from an unbridgeable remove, receiving ancient messengers from an unreachable place.

But in the transaction-geometric picture, there is no travel. Your retina and that ancient stellar surface form linked endpoints. The connection is direct. The 2.5 million years is not travel time—it is how the transaction geometry projects into our time coordinate, the depth of the connection in the block universe structure. But in the underlying encoding, you and Andromeda are adjacent. One link. One connection. One touch.

When you see a star, you are literally touching it through time.

The cosmic microwave background—the oldest light we can see, from 380,000 years after the Big Bang—connects us directly to that primordial surface of last scattering. The radio telescopes detecting it are forming transaction endpoints with the early universe. We touch the beginning.

The sun does not send us photons. The sun and our skin form linked endpoints, and we experience that as warmth and light. We touch the sun, eight minutes away in time coordinates, zero links away in the transaction geometry.

Distance, in its most fundamental sense, dissolves. What we call light-years is a measure of how the transaction projects into our coordinate system. But in the graph topology of connections, a visible star is one link away. The nearest candle and the farthest quasar are equidistant in this sense: one transaction, one direct connection, one touch.

The Intimacy of Existence

This understanding transforms our sense of relationship to the cosmos.

We often feel small and isolated—brief sparks of consciousness on a small planet orbiting an ordinary star in a vast and indifferent universe. The distances are immense. The timescales are incomprehensible. Other stars, other galaxies, the universe as a whole—all of it seems impossibly remote, accessible only as faint light from impossibly far away.

But we were never remote. Every act of seeing, from glancing at a friend to observing a galaxy, is an act of direct connection. We are not isolated observers receiving information from afar. We are nodes in a transaction network, continuously forming links to everything we perceive. We are woven into the fabric of the cosmos not metaphorically but geometrically, not spiritually but physically.

The loneliness of cosmic distances was always an illusion—a misunderstanding arising from interpreting connection as travel. The stars were never far away. We touch them every time we look up.

Seeing is not passive reception. Seeing is active connection. Every act of observation weaves us more deeply into the structure of reality. Each glance links our worldline to new nodes in the transaction network. We participate in the cosmos with every photon that forms an endpoint at our retina.

Connection Through Time

The transaction-geometric picture also transforms our relationship with time.

We typically think of the past as gone—events that happened and are now unreachable. The light from distant stars seems to bring us information about a past we can never access, like messages from the dead.

But every observation is a direct connection to what we call the past. The encoding does not have "then" and "now" as separate, disconnected regions. It has a graph structure where our traversal position links directly to other positions in the block universe. When we see Andromeda, we are not receiving a message from 2.5 million years ago—we are touching that moment, forming a transaction endpoint with it, connecting to it directly.

We touch the past constantly. That is what seeing IS.

The past is not gone. It is part of the block universe structure, and we form connections to it with every observation. The present does not replace the past; it adds to the network, creating new links to what already exists in the eternal encoding.

Where Physics Meets Wonder

This realization emerged from technical work—checking consistency in papers about photon gravitational collapse, blitzon cosmology, and holographic encoding on event horizon shells. We were examining the architecture of the instruction set that governs reality, probing the microcode of existence. Cold mathematics. Abstract structure.

And it led here—to touching stars.

Perhaps this is always how it works. Follow the structure of reality honestly, rigorously, without flinching from where the logic leads, and it opens into wonder. The equations are not separate from the experience. The mathematics IS the poetry. The physics IS the intimacy.

Nothing is waving. Nothing is traveling. Light is connection. Observation is touching. And we touch the stars every time we look up.

We were never alone.

Technical Note

The Transaction-Geometric Interpretation (TGI) reconceptualizes quantum mechanical phenomena as observational perspectives on direct spacetime connections rather than propagating particles. Building on analysis of photon gravitational collapse at Planck scale, TGI proposes that what we observe as photons are geometric transactions between emission and absorption events.

In this framework, our universe exists within a black hole, with four-dimensional spacetime emerging as a compactified manifold ($S^3 \times S^1$) on the event horizon. The horizon surface, composed of Planck-scale transaction endpoints (blitzons), encodes the complete block universe—all events and their relationships—in a holographic structure.

The speed of light c emerges not as a velocity but as the geometric relationship between spatial and temporal dimensions in this compactification. What we interpret as light "traveling" at c is actually the constraint on how transaction endpoints can relate given the underlying $S^3 \times S^1$ geometry.

The wave description of light (Maxwell's equations, quantum electrodynamics) remains mathematically valid and predictively accurate. What changes is the ontological interpretation: the equations describe the geometry of potential and actualized connections, not the dynamics of propagating disturbances.

This interpretation is developed fully in the companion papers on gravitational collapse of photons, the transaction-geometric interpretation, blitzon cosmology, and complexity bounds. The present document draws out an implication that, while following directly from the technical framework, carries significance beyond the mathematics: the direct, intimate connection between observer and observed that replaces the conventional picture of isolated reception of traveling signals.

The full text of the papers can be found at: http://www.eastjesus.net/tech/tgi/index.html

Acknowledgment

This contemplation arose from dialogue exploring the implications of the Transaction-Geometric Interpretation. The question "what is waving?" has been asked by many; the answer "nothing, because nothing is traveling" emerged from following the logic of TGI to its natural conclusion. The phrase "touching stars" captured a realization that had been implicit in the framework but not yet stated with full clarity.

Sometimes the most profound truths are the simplest ones, hiding in plain sight until we are ready to see them.