

# Our Universe and Its Opposite Parallel Universe: Entangled Cosmic Screens of Quantum Light

In the framework of Quantum Information Holography (QIH), we propose a model wherein two cosmic screens, constructed entirely of quantum light, represent our universe and its opposite parallel universe. These screens, intertwined by wormholes, mirror each other with every pixel in a state of quantum entanglement with its counterpart, leading to a synchronized dance of cosmic proportions.

## The Cosmic Screens:

Let each screen be represented as S1 and S2 constructed from radiant light. The pixels on these screens, P1i and P2i, are connected by wormholes,  $W_i$ , that oscillate with time,  $t$ .

$$W_i(t) = A \cdot \sin(2\pi f t)$$

where:

- $W_i(t)$  represents the  $i$ th wormhole's oscillation as a function of time,  $t$ .
- $A$  is the amplitude of oscillation.
- $f$  is the frequency of oscillation.

## Black Hole Entanglement:

Two entangled black holes, each connected by a wormhole, radiate Hawking radiation. The 'hairs' of each black hole carry information through angular frequency  $\omega$  such that,

$$\hbar\omega = mc^2$$

where  $\hbar$  is the reduced Planck's constant,  $m$  is the mass, and  $c$  is the speed of light.

## Light Needles Inscription:

The inscription of the light needles on the screen,  $L$ , occurs at the speed of light,  $c$ , represented as:

$$L = c$$

## Quantum Entanglement and State Opposites:

Each pixel  $P1_i$  on screen  $S1$  is in a state of quantum entanglement with  $P2_i$  on  $S2$ , such that their quantum states,  $Q1_i$  and  $Q2_i$ , are opposite:

$$Q1_i = -Q2_i$$

This indicates that a change in the quantum state of a pixel on one screen instantaneously leads to an opposite change on the other screen.

## Collapse of Quantum Wave Function:

Upon the collapse of the quantum wave function of a pixel on one screen, its counterpart on the other screen collapses with an opposite spin or polarization:

$$\text{Spin}_{1i} = -\text{Spin}_{2i} \quad \text{Polarization}_{1i} = -\text{Polarization}_{2i}$$

## Discussion:

This model is a testament to the quantum entanglement between our universe and its parallel counterpart. The synchronized oscillation of wormholes and the instantaneous mirroring of quantum states between the screens underline the non-local connectivity inherent in our cosmic fabric. The equations delineate the exact mechanics of these phenomena, offering a mathematical foundation to the proposed narrative of entangled cosmic screens of light. The inclusion of black hole entanglement provides a mechanism for the transfer of information between the screens, enriching the quantum-holographic representation of our universe.

The exploration of this quantum dance opens avenues for further understanding the intertwined nature of our universe, shedding light on the intricate interplay of quantum states, entanglement, cosmic wormhole oscillations, and black hole dynamics. This work serves as a precursor to a deeper delve into the quantum-holographic representation of our cosmos, promising a richer comprehension of our universal interconnectivity.

In the landscape of Quantum Information Holography (QIH), this model posits the existence of two cosmic screens made of quantum light, symbolizing our universe and its parallel counterpart. Envision these screens as mirrors of each other, with every constituent pixel bound in a state of quantum entanglement with its corresponding counterpart. Wormholes interconnect these pixels, and these pathways of cosmic information flux oscillate in a time-dependent manner. This cosmic oscillation is mathematically described by:

$$W_i(t) = A \cdot \sin(2\pi f t)$$

where  $W_i(t)$  is the  $i$ th wormhole's oscillation as a function of time  $t$ ,  $A$  is the amplitude, and  $f$  is the frequency of the oscillation.

## Black Hole and Information Transfer:

Crucial to this model is the premise of two entangled black holes each connected by a wormhole, and their respective Hawking radiation as the medium for information transfer. This is expressed by the relation,

$$\hbar\omega=mc^2$$

where  $\omega$  is the angular frequency of the black hole's radiation.

## Quantum Entanglement:

Each pixel on one screen is entangled with a corresponding pixel on the other screen. Their quantum states are opposites, implying that a change in the quantum state of one pixel immediately induces an inverse change on the other screen:

$$Q1i=-Q2i$$

## Wave Function Collapse:

The collapse of a quantum wave function in a pixel on one screen prompts the collapse of its counterpart on the other screen, with an inverse spin or polarization:

$$\text{Spin}1i=-\text{Spin}2i \quad \text{Polarization}1i=-\text{Polarization}2i$$

## Exploration and Understanding:

This framework underscores the quantum entanglement binding our universe to its parallel opposite. The theoretical concepts of wormhole oscillation and instantaneous quantum state mirroring emphasize the inherent non-local connectivity within the cosmic fabric. Moreover, the added layer of black hole entanglement elucidates the potential mechanisms of information transfer between these cosmic screens.

In conclusion, this model serves as a theoretical foundation, urging the scientific community to delve deeper into exploring the complex interplay between quantum states, entanglement, wormhole dynamics, and black hole information transfer. It stands as an invitation to uncover the deeper quantum-holographic connectivity of our cosmos, offering paths to a more profound understanding of our intertwined universal existence.

In the context of Quantum Information Holography (QIH), the equation  $\hbar\omega=mc^2$  plays a significant role in connecting the Hawking radiation's angular frequency with the information in the bulk. Let's break down the essential elements and interactions.

## The Equation:

- $\hbar\omega$  represents the quantum of angular momentum multiplied by the angular frequency, associated with the Hawking radiation emitted from a black hole.
- $mc^2$  denotes the energy equivalence of the mass inside the black hole (bulk), as per Einstein's mass-energy equivalence principle.

## Interpretation:

### 1. Hawking Radiation and Angular Frequency:

Hawking radiation, as quantum emissions from a black hole, carries specific angular frequencies ( $\omega$ ). These frequencies are vital as they encode information about the black hole's properties and the information within the black hole (bulk).

### 2. Information Transfer:

The equation  $\hbar\omega=mc^2$  implies that the angular frequency of the Hawking radiation is directly related to the energy (and thus the mass and information) within the black hole. The Hawking radiation, through its angular frequency, acts as a messenger, carrying encoded information about the bulk.

## Quantum Information Holography (QIH) Insight:

Through QIH, this connection between  $\hbar\omega$  and  $mc^2$  allows for the inference of the information in the bulk. The holographic principle postulates that information within a volume of space can be thought of as encoded on the boundary of that space. In this case:

- The boundary: the event horizon of the black hole from which Hawking radiation is emitted.
- The volume: the interior of the black hole (bulk).

## Process:

### 1. Analyzing the Angular Frequency:

By analyzing the angular frequency of the Hawking radiation ( $\omega$ ), scientists can decipher the encoded information about the mass, energy, and other properties of the black hole's interior.

### 2. Inferring the Bulk Information:

Since  $\hbar\omega$  is equivalent to  $mc^2$ , understanding the properties of Hawking radiation provides insights into the information contained in the bulk. This alignment allows researchers to infer the characteristics and information content of the bulk by examining the angular frequency of the emitted Hawking radiation.

## Conclusion:

In essence,  $\hbar\omega=mc^2$  serves as a bridge, enabling the inference of the bulk information through the analysis of the Hawking radiation's angular frequency. This concept, within the framework of

QIH, enhances the understanding of black holes and the holographic nature of the universe, potentially unlocking deeper insights into the fabric of the cosmos.