

## The Nature of Mathematical Intuition and Mental Imagination

**Abstract:** The nature of mathematical intuition and mental imagination are explained in terms of the holographic principle. The key factor for this explanation is the nature of the mind's eye, which has no scientific explanation.

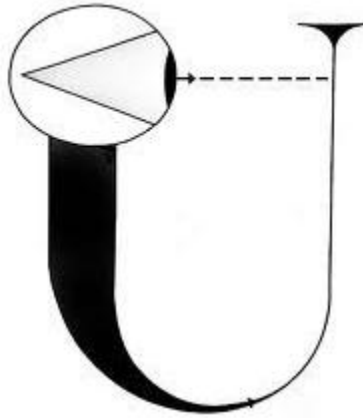
**Keywords:** Mathematical intuition, mental imagination, mind's eye, holographic principle

**Introduction:** Mathematicians often speak about discovering new mathematics based upon their intuition about geometry. They don't base it on sense perception of the physical world, logic, reason or solving equations, but on their intuition about geometry, which they can see in their mind's eye. The geometry they can see only exists in their mental imagination. This mathematical intuition about geometry spills over into theoretical physics. Einstein had a deep intuitive understanding of the structure of a curved space-time geometry for several years before he discovered his field equations for gravity. He actually struggled for several years before he discovered the equations. He was able to make predictions about gravitational effects based only on his geometrical intuition, which his equations eventually confirmed. Feynman eventually solved the problem of quantum electrodynamics only after a confusing period of about twenty years during which time the mathematical structure of quantum theory was understood and both Maxwell's field equations for electromagnetism and the Dirac equation for the electron were known. Feynman only discovered the solution based on his deep intuitive understanding of the geometrical structure of the path integral formulation of quantum theory that led to his discovery of Feynman diagrams. Another example is the discovery of the Lorentz group and Majorana spinors, which is the fundamental basis for the standard model of particle physics as formulated in terms of quantum field theory. This discovery was based on a deep intuitive understanding of the geometrical structure of Minkowski space.

**Analysis:** None of these examples of mathematical intuition are based upon sense perception of the physical world, logic, reason or solving equations. They all arise from a deep intuitive understanding of geometry that arises from seeing that geometry in mental imagination, as seen by the mind's eye, which cannot be explained in scientific or logical terms. Even if science could come up with a plausible explanation for the nature of mental imagination, it has no explanation for the nature of the mind's eye.

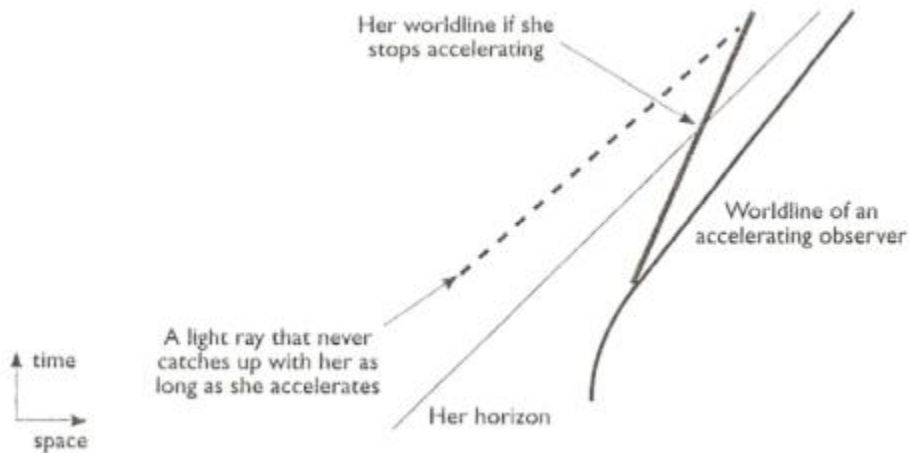
The critical factor at work here is the connection between the nature of intuition and the mind's eye, for which science has no explanation and never will have an explanation. The critical question is who is seeing what? When you see something with your mind's eye, are you the thing you see, or are you what is seeing things? The obvious conclusion is that you are the presence of consciousness that sees things. When you see things, you are not the thing you see, like the form

of a person that appears in the physical world you perceive, but the presence of consciousness that perceives things. That presence of consciousness is the nature of the mind's eye.

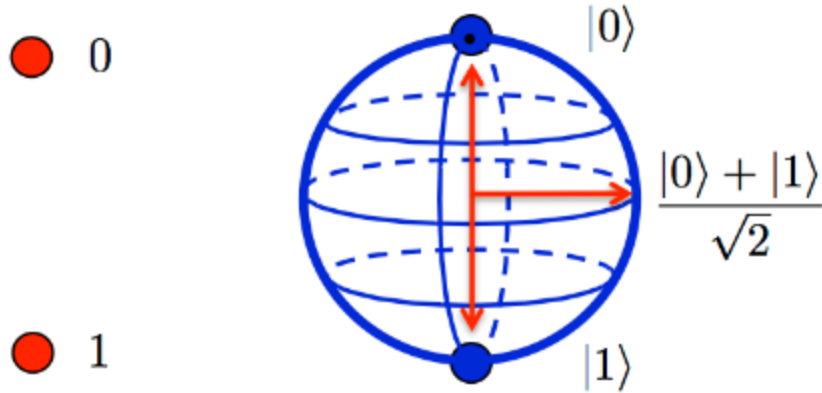


Intuition is an aspect of that consciousness, and is not inherent to a person or its mind, which are perceivable things. You are that presence of consciousness that we call the mind's eye, which is to say that you are nothing more than the consciousness present at the center of your own world. Intuition is an aspect of your true nature. You naturally develop intuition about the nature of things as you focus your attention on whatever is being displayed in your mental imagination.

How is this even possible? The holographic principle gives a natural explanation. Mental imagination is being constructed on a holographic screen. That holographic screen arises due to an observer's accelerated motion that gives rise to its event horizon that becomes its holographic screen when qubits of information are encoded on its horizon.



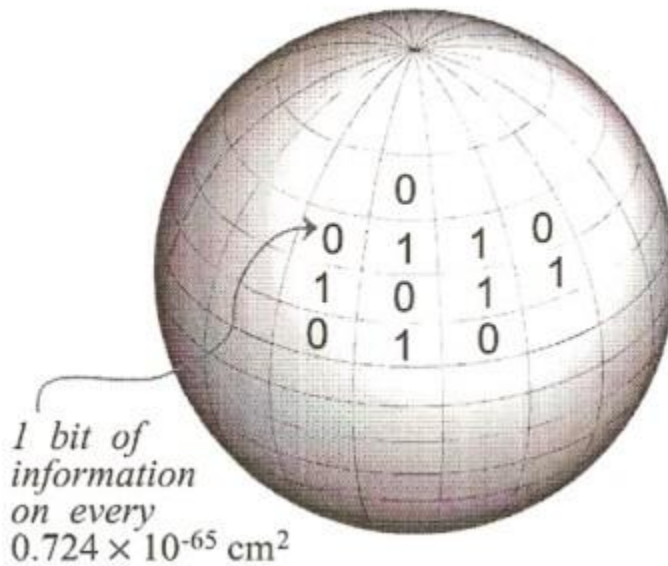
Accelerating Observer's Event Horizon



**Classical Bit**

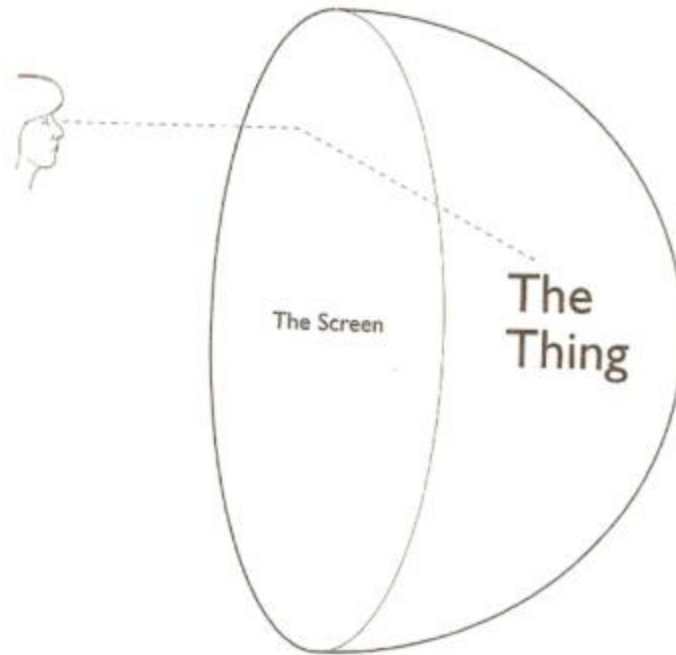
**Qubit**

Qubit of Information Encoded on a Planck-size Event Horizon



Holographic Principle

Mental imagination is just like the animated images of a virtual reality movie that's being constructed and displayed on a computer screen as the images are projected to the central point of view of an observer. The observer's holographic screen is its mental screen that constructs and displays the images of mental imagination, and the observer at the center of its own holographic world is the mind's eye that perceives the images of mental imagination. All objects of perception that can be perceived by the observer are forms of information that can be reduced to qubits of information encoded on its own holographic screen. Those forms are projected like images from its screen to its central point of view and are animated in the flow of energy that arises from its own accelerated motion.

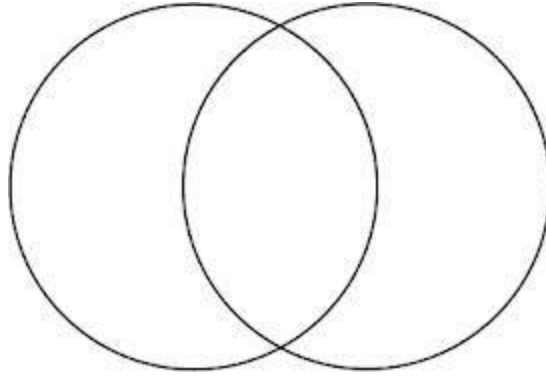


### The Observer, its Holographic Screen and its Object of Perception

There is only confusion about this state of affairs because the observer at the central point of view of its own holographic world is emotionally identifying itself with the form of its character in the virtual reality movie that's being displayed on its holographic screen as that personal form is emotionally animated relative to all other forms that appear in its holographic world, which leads to feelings of emotional self-limitation to that personal form. In reality, the central form of a person that appears in the observer's holographic world is only like an avatar in the virtual reality or the central character in the movie.

How do we explain a consensual reality shared by multiple observers, each present at the central point of view of its own holographic world? The answer is information sharing, like that seen in a network of connected computer screens. Each observer observes events in its own holographic world as displayed on its own holographic screen that arises due to its own accelerated motion, but those screens can share information to the degree they overlap like a Venn diagram.

A peculiar aspect of this kind of consensual reality occurs when information is no longer shared, which can be called a disconnection syndrome. In effect, the observer's holographic screen is no longer connected to the network and no longer shares information with the screens of other observers. This kind of disconnection routinely happens during dreaming sleep and in the mental imagination of daydreams. Mental imagination becomes a private experience.



### Information Sharing Among Overlapping Holographic Screens

**Conclusion:** A corollary of this analysis is the observer's sense perception of the physical world is also constructed in its mental imagination. There is no objective physical reality of a world out there that is represented in mental imagination. The perceived physical world is a holographic world constructed on a holographic screen, just like all other forms of mental imagination. A perceived holographic world is a construction of mental imagination, and is not an objective physical reality that can be perceived and represented in mental imagination. Mental imagination as constructed on an observer's holographic screen is the whole thing. In reality, everything you can perceive in your own holographic world is a figment of your own mental imagination.

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