

## A QUANTUM CHEMICAL APPROACH TO CONSCIOUSNESS BASED ON PHASE CONJUGATION

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**ABSTRACT:** Classic holography involves a reference beam and an object beam (which bounces off an object) which interact and form a holographic interference pattern on a holographic plate (grating). This method has been used for numerous applications and theoretical models. Holographic information storage is often utilized in the field of opto-electronics. The goal of this research is to understand how to transmit/receive, code/decode, modulate and focus optical signals.

**KEYWORDS:** Holography; Holographic information; Information storage; Optical signals

Classic holography involves a reference beam and an object beam (which bounces off an object) which interact and form a holographic interference pattern on a holographic plate (grating). This method has been used for numerous applications and theoretical models. In classical holography a coherent laser beam is required to generate interference patterns. In quantum holography, however, quantum light (a single or double photon beam) is used as the source for the reference beam. In this case the reference beam contains two electrons or photons that are entangled. One of the photons acts as a reference beam and interacts directly with the holographic grating. The second photon interacts with the object to obtain information about the object, but does not interact directly with the holographic grating. Instead the information about the object is transferred to the holographic plate via entanglement between the two photons. The net result is the formation of an interference pattern similar to that obtained with classic holography.

Holographic information storage is often utilized in the field of opto-electronics. The goal of this research is to understand how to transmit/receive, code/decode, modulate and focus optical signals. Holographic data storage, with its huge data

capacities and fast data-transfer rates, is promising to become the next-generation optical data-storage technology.

### PHASE CONJUGATION

Phase conjugation, also referred to as four-wave mixing or stimulated Brillouin scattering, is mediated via a phase conjugation mirror. Incident coherent light is reflected off such a mirror in an unusual manner. The reflected beam is the complex conjugate of the amplitude of the input wave. Instead of being classically reflected at an angle, the reflected beam retraces its path coincident with the incoming wave-field returning back to its source. The reflected beam, or phase conjugate replica, is referred to as second harmonic (Hsieh, 2010), time reversed (Hellwarth, 1978) and virtual (Powers 2011) radiation. Phase conjugation is now being used for spatial information processing (White, 1982). It is used in nonlinear optical imaging to increase the efficiency of image transmission along optical fibers and to restore distorted spatial and phase information (White, 1982). In phase conjugation holography, the photographic film used in conventional holography is replaced with a phase conjugation mirror. This has been achieved experimentally using electro-optical material and crystals (Kukhtarev, 1976). Phase conjugation holography uses complex spatial information processing for image storage, amplification and transmission that can surpass those of traditional recording methods (Weingartner 2002).

### PHASE CONJUGATION IN BIOLOGY

In addition to non-linear optical applications of holography, the concepts associated with this technology have also been used to describe consciousness in general as well as various functions of the mind- perception, intention, attention and intuition. Bischof further attributes this mechanism to account for learning and memory (Loo 2004). Previous holographic models of consciousness describe how light generated from a perceived object is reflected off a phase conjugation mirror-like grating containing stored information about the object in the form of constructive interference patterns. The virtual light which is reflected off the mirror forms a virtual image of the original object. The image and the object are coincident, superimposed and entangled. The brain then interprets the image as the perceived object (Marcer, 1997). Mitchell (2011) similarly proposes that the virtual energy field of an object is reflected off a holographic grating in the brain and this outgoing field interacts with the incoming virtual field from the object. When these two virtual fields meet, they form a virtual interference pattern and a standing wave. This model further proposes that the observer also emits a virtual energy field of its own which is reflected off a phase conjugation mirror located in the perceived object. The reflected virtual light from the

object interacts with the virtual light from the perceiver and forms a second set of interference patterns. Furthermore, the two sets of interference patterns exchange information via resonance interactions.

Whether physical or virtual interference patterns are considered, shining a light on these patterns creates a hologram. Marcer (1997), Mitchell (2011) and Pitkanen (2015) describe this hologram as a conscious quantum hologram. All three models use the quantum hologram to characterize and even define the mind, although Mitchell admits that holograms can occur in every cell of the body.

The location of the holographic mirror/grating in the body and in the brain is rarely defined. This is of particular concern when using phase conjugation holography. Since phase conjugation has been observed in nanoparticles (Hsieh 2010), fluorocarbons (Yoshida 1997) and sodium atoms (Hemmer, 1995), these molecules assumedly contain a phase conjugation mirror. Since phase conjugation holography has been proposed to mediate perception, the phase conjugation mirror has been proposed to reside in the neuronal circuitry of the brain. Mitchell proposed that the grating is found in the logic gates within neuronal circuitry of the brain (Mitchell 2011). Some propose the holographic grating occurs as spatio-temporal patterns in the brain. Others have proposed that the grating exists in crystalline and liquid-crystalline structures in the brain. This is a reasonable hypothesis because there is scientific evidence that planes within a crystal interact with incoming laser light and exhibit phase conjugation behavior (Kukhtarev, 1976). Finally it has been proposed that the holographic grating exists as space/time patterns in free space or in the ZPE of the vacuum (Mitchell, 2011) and not in the brain.

#### MOLECULAR PHASE CONJUGATION MIRRORS

The molecular electronics industry has synthesized several organic dyes and polymers which exhibit unusual non-linear optical properties. Infrared absorbing dyes, for example, have been shown to exhibit phase conjugation behavior (Maloney, 1988). Certain chemicals, like isopropanol and hexane, also exhibit phase conjugation behavior (Slatkine, 1982). However, relatively few studies have demonstrated the ability of natural bio-molecules to exhibit phase conjugation behavior despite the fact that the benzene molecule exhibits quantum properties due to its delocalized pi electrons (Wyatt, 1992). Nonetheless, a primary example of a natural biomolecule exhibiting phase conjugation, even using low light intensities, is bacteriorhodopsin (Werner, 1990).

Another example, is the porphyrin molecule which also exhibits phase conjugation behavior (Devane, 1984; Gosh, 1998).

Porphyrins are usually attached to heme protein molecules. Protein molecules themselves are capable of inter-molecular communication, a phenomena which is well described in the literature in terms of protein-protein interactions. Such interactions form networks which allow information to be transferred non-locally within the networks (Jansen 2003). The topological features and global organization of such networks are often studied in systems-biology.

Like proteins, porphyrins have the ability to self-assemble into coordination networks (Abrahams 1994). These crystalline-like networks are held together by Van der Waal forces, hydrogen bonds and pi-pi interactions. Porphyrin molecules are described as building blocks forming highly ordered supra-molecular assemblies capable of long-range inter-molecular interactions. They form various 2D and 3D interconvertible topologies including closely packed rhombic, hexagonal and square symmetries (Lein 2001, Kuhn 2008).

Porphyrins themselves contain four benzene groups connected by coordination bonds with a metal ion (Fe, Mg, Mn, etc) in the center. Porphyrins are conjugated systems because they contain alternating single and double bonds. As such they contain delocalize and highly mobile pi electrons which generate large amounts of energy due to highly efficient electron transfer. In some cases electron transfer can occur as quantum tunneling thereby indicating they can function at the quantum level. Thus, they are used in the electronics industry as p-n junctions, transistor sensors, semiconductors and solar cells (Studener, 2015). In biological systems, they function to convert chemical energy and to transport oxygen in the blood (Goldberg, 1988).

## THE QUANTUM CHEMICAL MODEL OF CONSCIOUSNESS

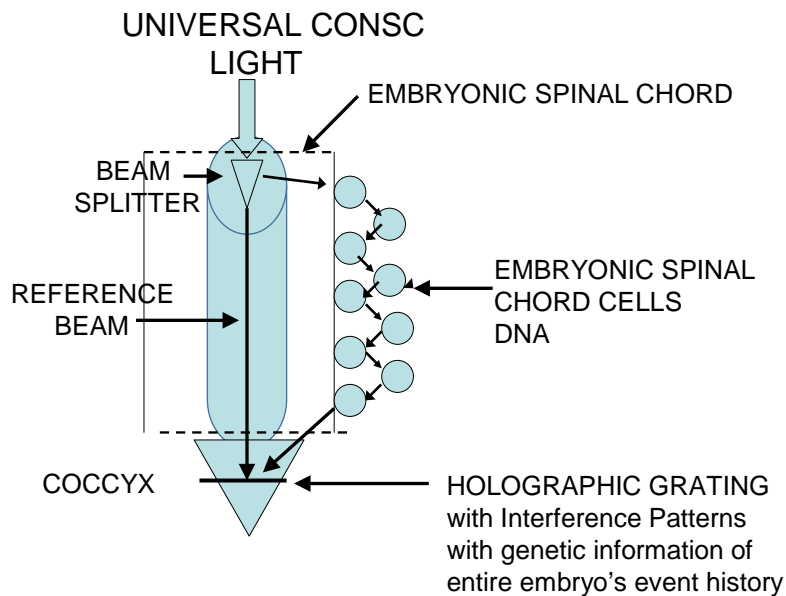
### *A. Formation of Holographic Phase-Conjugation Gratings*

The present model proposes that the holographic grating resides in the quantum chemical properties of porphyrin networks known to exhibit phase conjugation behavior.

It is proposed that in the young embryo, just after the spinal chord is formed, two main holographic grating are created – one at the base of the spine and one at the top of the head (see Figure 1). In the first case, Universal Consciousness enters the top of the head as quantum light and acting as a reference beam descends down the central channel of the spinal chord until it reaches the base of the spine at the coccyx. A portion of this quantum light is deflected off the central channel by crystalline lattice structures at the top of the head which act as a beam splitter. As the light descends toward the base of the spine, it interacts with the cells immediately surrounding the

spinal chord where it is reflected by various cellular components (biochemicals, microtubules, DNA etc). Thus this beam is modulated by the information contained within these structures and acts like an object beam in holographic language. These two beams meet at the base of the spine where their interaction produces constructive interference patterns thereby creating a holographic grating. It is proposed here that this holographic plate also functions as a phase conjugation mirror. It is further proposed here that the holographic grating is a 3D network of porphyrin-enriched bone cells in the coccyx.

**FIGURE 1**



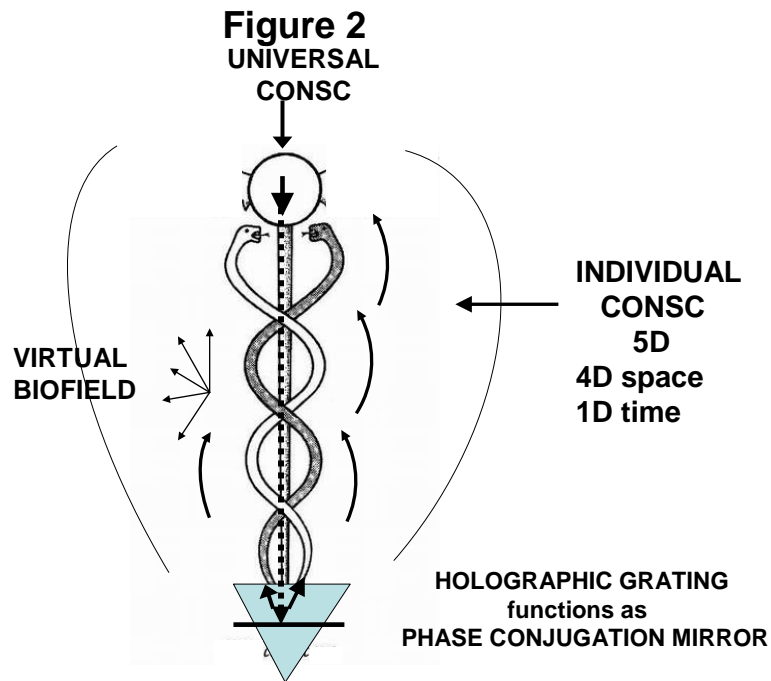
A similar process occurs when Universal Consciousness enters the embryo at the base of the spine. In this case the reference beam ascends straight up the spinal chord and ends at the holographic grating in the crown of the head. The object beam interacts with the various cells around the spinal chord as it ascends up the body. The interaction of these two beams forms a second holographic grating at the crown of the head which also functions as a phase conjugation mirror.

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*B. Creation of Individual Consciousness*

The model further proposes that after the holographic grating is created, Universal Consciousness again enters the now mature fetus at the top of the head as quantum light and travels down the central channel within the spinal chord to the base of the spine (coccyx) where it is reflected back as a phase conjugation replica (see Figure 2). As this virtual light energy ascends back up the spinal chord in a criss-cross fashion, it concentrates and forms a hologram at key centers along the spine where major organs are located, eg. solar plexus, heart, throat, etc. In addition, as the virtual light ascends up the spine it radiates outwards permeating all the cells in the embryo and further extends beyond the skin. This radiated energy can be considered the quantum hologram referred to in the writings of Marcer (1997) and Mitchell (2011) and the biofield by others (Rubik, 2002; Rein, 2004), but is here referred to as individual consciousness. Thus, the present model distinguished Universal Consciousness from individual consciousness, where the later can be considered a subset of Universal Consciousness. This endogenous virtual hologram contains all the physical (biochemical), mental (mind) and emotional information about the fetus including its entire event history.

Similarly when the quantum light of Universal Consciousness enters the mature embryo at the base of the spine, it ascends up the spinal chord and interacts with the interference pattern previously created at the top of the head. When it is reflected off the phase conjugation mirror at the crown, it descends and forms a hologram commonly referred to as the mind.



Thus the present model of consciousness explains the formation of individual consciousness and the individual mind from Universal Consciousness. Such a model also allows the conclusion that although each individual consciousness/mind is unique, we are all subsets of Universal Consciousness and are therefore all composed of the same fundamental energy (consciousness). Sharing such an innate essence indicates that all humans are fundamentally the same despite our apparently different external appearance.

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