

## Chapter 8: Quantum Consciousness

A comparison of the latest available data, despite the different scales of objects, unexpectedly revealed a deep commonality of the foundations of the universe, that the micro- and macrocosm "are not so different from each other" -Kravkov

In a previous chapter, 'Ch. 4 Lessons from an American Weapons Designer' we read about the development of Thought Injection of Dr. John Norseen, while employed at Lockheed-Martin. In his research articles and in conversations he explained several of the key areas involved in his work. One of the areas that he touched upon was the concept of Quantum Consciousness, citing many researchers in this area, he was influenced by the holonomic ideals of Dr. Karl Pribram, Dr. Norseen, specifically in one particular key technological area his research specifically cites the gravitational based Orchestrated Objective Reduction of Nobel laureate Sir Roger Penrose and University of Arizona professor, Dr. Stuart Hameroff. It is important to again note Dr. Norseen's concept of Quantum Shift Keying (QSK), which is to say a code, which was suggested in Koruga-Hameroff's 1994 research on Quantum Consciousness, Norseen claimed to use this QSK as a lock-key mechanism that he also compared to Die casting a thought into the biological fabric of a target brain. In the previous chapter, 'Ch. 6 Physics of Neuroweapons' we studied how gravitational waves served as the basis of this technology, and in detecting gravitational waves the technology of interferometry is used. Which is exactly how Norseen viewed the brain, the brain is an interferometer:

"If we take Pribram and the Russian work, it shows that the human brain structure is an interferometer that uses Gabor Function (wavelet-codelet analysis) in Hilbert Space."  
(Norseen, 2002, Part 4)

GABOR FUNCTION	Spectral domain first, inverse transform to space time, phase space
HILBERT SPACE	A phase space in which the geometric coordinates are supplemented by dimensions representing means of variation (frequency, probability, amplitude, phase)
HOLOGRAPHY	A method of representing space time configurations (images) by their spectral transformations. The initial configuration can be recovered and from the representation by the inverse transform.
HOLONOMIC	Representation in Hilbert Space (Spectral & Time Space)
STEGANOGRAPHY	Image hidden Stego-Objects

A slide preserved by Laurie from a presentation prepared by Dr. John Norseen

Gabor Function	Spectral domain first, inverse transform to space time, a phase space
Hilbert Space	A Phase space (Sequence, probability, amplitude phase)
Holography	A method of representing space time configurations by their spectral transformations. Acted upon by the inverse transform.
Holonomic	Representation in Hilbert Space (Spectral and Time Space)

The seat of the QSK is revealed by Dr. Norseen as taking place in a particular part of the brain, inside neurons, in the molecular mechanism of Microtubules (MTs) writing:

“Invariance can be captured in MT by quantum encryption of various combinations of photons, phonons [GW produces phonons] and electrons, which may synergistically produce, via solitons, a binding property of emergent epiphenomenon, a **biofield communication** both local and **non-local** to the **protein MT strings**. Calpain induced start/stops in the dendritic-synaptic receptors, with varying degrees of glial cell neurochemical nutrient infusion, turn on or off the QSK coded learning sequences in the MT. As more and more of neuronal activity forms a topological geometry around these events, oscillating in concert, perceptual and then cognitive events transpire, suggesting a process for sensory to sentient computation” Norseen (1996)

A phonon is the quantum mechanical description of an elementary vibrational motion in which a lattice of atoms or molecules uniformly oscillates at a single frequency. In classical mechanics this designates a normal mode of vibration.

In his conversations with Laurie he speaks of the Orchestrated Reduction, in his 1996 Russian presentation he cites Hameroff's ORCH-OR three times:

Semiotics leads to greater complexity and teleological concentration of energies. Brain structures form to interface and resonate with ZPE; memories are captured ZPE events stored in orchestrated reductions of proteins. When memories are tapped by brain signals — electromagnetic, biochemical or phononic or vibrational — the proteins unwind and unleash the stored memories. Then, as proteins do, they rewind themselves to be tapped again...think of a balsa wood, rubber band-powered airplane that can be used over and over again to fly around the yard. (Norseen, 2002, Part 11).

An important thing to notice about these remarks, aside from familiarity with Orchestrated Reduction of Penrose, is that he is also formulating the Amplifier Theory of Jordan, as he speaks of memories coming from ZPE, Zero Point Energy, which are vacuum fluctuations of virtual particles which in the Classical world are encountered in the Casimir Effect where virtual particles can appear, of which we will read more about from Dr. Michael Persinger later. Dr. Persinger also points to ORCH-OR as a viable candidate as a physical explanation for Consciousness, see more below  
In talking about the negentropy (structure) of Semiotics Norseen brings up the issue of the ability to speak of them quantitatively and then improve on that quantization through technology:

So if you are concerned we are dealing in Esoteric, erudite, non-approachable conditions of Semiotics and Radionics and ZPE and Alfvén Wave Grids, then BE SOFTENED my good friend. The very fact that SEMIOTICS requires structure means that it can be TESTED, MEASURED, VERIFIED and understood and **TECHNICALLY AMPLIFIED**. I have given examples of how simply **twisting Chromatin within a mitochondrial (ZPE channel) cell structure results in SEMIOTICS** expression and cell division/cloning (Representamen)...and this can be shown faithfully and measurably. (Norseen, 2002, Part. 7)

The question becomes is how is the measuring done? To which Norseen has also provided some insights, speaking of using holography, which we also encountered in the work of Dr. Bar in terms of gravitational wave holography. Norseen also speaks of the gap junctions between neuronal cells, they correspond to a small enough distance for Casimir Effects to take place:

It is only in the communications switching capacity of the brain — (no two neurons normally physically touch each other, therefore, this gap represents a switching capacity), and it is this switching capacity of several million objects that allows for our great mental scan and scope capabilities, not the Memory Storage in physical memory of proteins.

This structure is almost limitless in the ability to generate Holonomic - holographic like resonance patterns. In physical protein memory, there are parts of the brain that deal in one memory to one laid down protein. For instance, in the Fusiform Gyrus, the one to one memories of loved one's faces are stored in isomorphic recall conditions, whereas the rest of the brain is involved with undulating and regular modifications of the alternating calpain, induced plasticity of neurons and protein lay down, that occurs each time we introduce a new memory for codification. These functions normally take place during the delta frequency of deep sleep patterns, only after repeated Rapid Eye Movement (REM) cycles trigger new memory consolidation.

(Norseen, 2002, Part. 7)

Here he is noting the difference between Long Term Memory which can become encoded in proteins, and a holographic resonant model of memories before they become encoded as long term memories. Not all resonances will become memories though. Norseen has noted that to get a hologram of the brain state at a given time that the Casimir Effect is employed. Another methodology he explicitly brings up in regards to measurements and modeling (holographic mapping) is the Zeeman Effect which he received from the Russians:

"I am into Continuous Wave Energy (CWE) using the Zeeman Effect (ZE), and refined by the Russkies under Zavoisky in '45, and picked up by the Japanese in the mid 80's at Hitachi. It is even being used in conjunction with some deep space and HAARP projects and hyper spectral satellite transmissions groups to find gravity lenses, and ionosphere scintillation factors that corrupt GPS, etc. Anyway, in the human brain the combination of electric fields, biochemical

plasma and magnetic dipoles [MT dipoles] set up conditions ripe for monitoring by CWE and the hyper spectral definitions come about by looking at the Zeeman Effect - the directions that the electrons take in the presence of the regular and applied magnetic field...you can peer right into the actual communications structures, the semiotics if you will, of the target. (Norseen, 2002, Part 8)

He writes in another section:

...and right at the zone where Alfvén Wave corridors of the brain Magnetite exchange ZPE in the dendritic neuropil at nanoscale [MTs], discrete bandwidth, channels. It is right here in the Marianas Trench of human thought/perception, that the person is exposed to the Universals of Quantum State potentials, and that each individual thought or Semiotic Identity is formed, only to then bubble or shoot right up to the surface of positive thought realms. Just as you can look into an aquarium or a fish bowl and see the stuff at the bottom work its way up to the surface, you can track the origin of Semiotics from Alfvén Wave Interactions with ZPE, from the plumbed depths of the Brain. (Norseen, 2002, part 6)

Norseen here specifically mentions the Zeeman effect, which is of special interest because of the importance of Zeeman data in the analysis and theoretical interpretation of complex spectra used in Atomic spectroscopy and spectroscopy in general--the study of the interaction between [matter](#) and electromagnetic [radiation](#) [see chapter 6, 'Physics of Neuroweapons' for HFGW spectroscopy of Dr. Robert Baker]. Pieter Zeeman effect: splitting of a spectral line into several components in the presence of a static magnetic field (CWE radar of Norseen). It is analogous to the Stark effect, the splitting of a spectral line into several components in the presence of an electric field. Splits, via changing angular momentum, a spectral line say 400nm into a more energetic line, it's normative line and a less energetic line, 3 lines. Since the distance between the Zeeman sub-levels is a function of magnetic field strength, this effect can be used to measure magnetic field strength, e.g. that of the Sun and other stars or in laboratory plasmas. The Zeeman effect is very important in applications such as nuclear magnetic resonance spectroscopy, electron spin resonance spectroscopy, magnetic resonance imaging (MRI) and Mossbauer spectroscopy. A theory about the magnetic sense of birds assumes that a protein (cryptochrome-2) in the retina is changed due to the Zeeman effect. humans have similar proteins in their eyes. Kernbach in experiments directly related to the work of Norseen has noted that earlier Russian versions of this technology used spectroscopy based on Impedance Spectroscopy which uses Zeeman splitting. Kernbach also notes that this technology is used in Intelligence work:

There are known cases of application of these methods in anti-terrorist, military and intelligence operations but they also have the nature of rare exceptions. Reaction from the academic community is quite polarized, although in the field of quantum research such a potential it is quite possible: 'Quantum entanglement allows engineered quantum systems to

exceed classical information processing bounds', especially for biological systems, neurons, nervous system and brain (and 'nonlocal functions' of consciousness) (Kernbach, 2018)

Kernbach further elaborates on the meterological aspects of this science speaking in regarding keeping track of entangled objects and mapping them:

The proposed method for remote monitoring is based on Electrochemical Impedance Spectroscopy (EIS) with optical excitation and is a combination the nation of the two systems published in [36] and [25]. The essence method is to create a entangled system from a remote object and a measuring container with liquid. A new element is the introduction of optical IC excitation at two wavelengths 470 / 940nm into the measuring system. Experiments with LED demonstrated the property of transmission of influence between two entangled macrosystems therefore, it is assumed that in the presence of an optical the excitation of the container with water will be the impact is also the remote object. Necessary bridging of EM radiation for entangling macro objects other authors also paid attention. Measuring the excitation of electrochemical dynamics water system, it is possible to express this impact result in numbers. The more 'active' the remote object is etc, the more intense the EIS deflection will be from an unexcited state. For a numerical estimate uses a statistical method to characterization of electrochemical noise, which is good has proven itself in other EIS applications. Thus, this method makes it possible to estimate the degree of the level of the 'activity' of a remote object is its way the ability to influence other objects. By observations, this property is characterized by biological organisms, generators, shape effects, certain processes. An interesting area of study is the 'activity' of information (sym-free) objects, which brings us back to the discussion in work on the possible independent character of the sym-free structures. 'Activity' can stimulate or depress the dynamics of the corresponding channel. These changes can be expressed in terms of entropy (negentropy) and associate with the state of the remote object. This moment is especially interesting when working. with pathogenic objects / zones, allowing casting their possible parameters without directly the contact. Experiments have shown so the same possibility of selective detection of global 'informational / cosmo-biological' events. In tests with human, when volunteers with sufficient the exact level of sensitivity was informed the beginning of the measurements, various subjective reactions - dizziness, specific 'tingling / burning' on the skin, changes in state of consciousness and sleep patterns. If the subject is not knew about the measurement process, he could determine in large in most cases, the fact of measurement, however there was an error in determining the measurement time. With short-term use, this method can can be used for self-diagnosis, for example, when taking infoceutical drugs or with psycho mental training (yoga, meditation, various practice), in the experiments there was a correlation between the current psycho-physiological state and the received data. (Kernbach, 2018)

Others Kernbach points to in Russia working on 'Quantum Indexing of Entangled Macro Objects' during the Soviet era were Shkatov, Kravchenko, Savelyev [who worked with Okatrin, see below]. With this ability to alter brain, nervous systems with nonlocal functions of consciousness would be one of the most valuable assets any military commander could have, hence, we see the importance the KGB put behind developing these technologies. Indeed, the Soviet Military was involved in this research:

"The test of the Radiation installation in military unit 71592, where this installation was created (in the Novosibirsk region), has become well-known. A report on this test was heard at the Institute of Radio Engineering and Electronics of the Russian Academy of Sciences. The authors of the invention called the report "Impact on biological objects by modulated electrical and electromagnetic impulses"

The ability to cover an entire battlefield is noted, "You can put an entire stadium, concert hall or military unit into a 10-minute sleep using psychotronic weapons.". From the preceding we can see the direct connection of remote biological influence and it's study as a weapon by the Soviet Military.

Regarding the spectroscopy involved it is interesting that it in one presentation for the product GeoScan System speaks of referencing hyper dimensions in their program in this use instance it is able to penetrate kilometers of earth to find mineral deposits, when radar can only penetrates a few meters (Geoscan 2016). Again, this research was also looked into by the Soviets from at least the 1970s. (Sokolova, 2016)

In an interesting corollary, Persinger relates the Schumann Resonance to the Zeeman effect in the cerebrum:

"The operating intensity of the cerebrum has been measured and calculated to be in the 1 to 100 pT range with a wide band of coefficients. From this context it is interesting that  $\text{kg/As} \cdot 1/\text{s}$  or the mass of an electron divided by a unit charge multiplied by 7 Hz is  $9.1 \times 10^{-31} \text{ kg}/1.6 \times 10^{-19} \text{ As} \cdot 7 \text{ Hz}$  (1/s) or  $40 \times 10^{-12} \text{ T}$ . This relationship is closely coupled to the Zeeman effect whereby the application of a magnetic field produces an additional or a third spectral line in an absorption spectrum by inducing different quantum levels. The change in angular frequency with an applied field of  $40 \times 10^{-12} \text{ T}$  would be, according to classic Zeeman formula solutions, the product of  $4 \times 10^{-11} \text{ T} \cdot 1.6 \times 10^{-19} \text{ As}$  divided by  $12.56 \cdot 9.1 \times 10^{-31} \text{ kg}$  or about 0.6 Hz. However in non-angular systems it would be 7 Hz [Schumann Resonance]." (Persinger, 2010, 818)

Persinger here seems to correlate the rate of Alpha Brain Waves with the Zeeman effect's angular momentum, suggesting that the reason that at 7Hz the entire Brain is vibrating, which is also the Schumann Resonance of the Ionosphere, in other works Persinger has suggested that there is some memory connection to the EM in the ionosphere and particular individual brain memories, remote storage of memories in the ionosphere.

Another area that is of interest in terms of mapping is the ability to measure brain waves. The Casimir effect plays a direct role in these waves. As the effect creates the contracting and expanding of neuron cells. Duncan Laurie gave this encapsulation of Norseen's presentation on the creation of brain waves:

The communications described are instantaneous, and to describe how that is possible, Norseen introduced two additional factors: Zero Point Energy and Alfvén Waves. Zero Point Waves (ZPE) having been introduced earlier in the manuscript. This energy of the vacuum has actually been measured and is called the Casimir Effect. The Casimir Effect is measurable when two metal plates are placed extremely close together (1 nanometer). The vacuum created interferes with the flow of ZPE and has been scientifically measured. The result is that the plates are drawn together, as if by magnetic attraction. Norseen points out by comparison that the identical 1 nanometer distance is the distance between brain cells, thereby implying a stage for ZPE coupling. As these distances open and close between the cells, a signal impressed upon the ZPE [virtual particles in a vacuum] can be generated out in the 5-30 Hz. range.

How it becomes an instantaneous signal reaching anywhere in the universe is accomplished by the Alfvén Wave (AW). Norseen's definition of Alfvén waves is that of a magnetic string stretched out, and then impinged upon by unique traveling magnetic resonant structures...like plucking a magnetic harp. Theoretically, Alfvén waves interconnect all parts of the universe via magnetic fields. Magnetite within the brain cells connect local magnetic swirls to the magnetic river or storms existing locally or outside our magnetosphere. Norseen describes the AW as a universal plasma that extends between local and non-local events, capable of carrying semiotic communications via directed ZPE [virtual particles in a vacuum] pulsation. These signals are capable of penetrating the magnetic storm, in the same way radio signals penetrate our congested airways carrying selective information from point to point. (Norseen, 2002)

Here Norseen seems to suggest that to observe Brain state, you need an EM field (Alfvén Wave Grid), which can also be a correlate to a Gravitational Field, perhaps using gravito-electromagnetics (GEM). An Alfvén Wave is a wave behavior of magnetic grid lines, if you could imagine those grid lines as the surface of an ocean, then the Alfvén Waves would be surfable. A more technical definition is given:

Alfvén waves, being transversal, are incompressible.

In a compressible fluid, the pressure acts as a restoring force, and one obtains sound waves. The combination is magneto-acoustic waves, which have three modes: i) unchanged Alfvén mode, because it is incompressible; and sound waves modified into two coupled slow ii) and fast iii) modes. Considering a stratified fluid (e.g., an atmosphere) and adding gravity as a restoring force, one has magneto-acoustic-gravity waves and Alfvén-gravity waves decouple only if the horizontal wave-vector (which exists only in the direction transverse to stratification) lies in the plane of gravity and the external magnetic field. Adding rotation and the Coriolis force as the fourth restoring force leads to magneto-acoustic-gravity-inertial waves for which decoupling of Alfvén-gravity modes is generally not possible. Below, the Alfvén waves are uncoupled to other types of waves in fluids. [https://encyclopediaofmath.org/wiki/Alfv%C3%A9n\\_waves](https://encyclopediaofmath.org/wiki/Alfv%C3%A9n_waves)



Although, Norseen here seems to use Alfvén waves as a pseudonym for 'magnetic grid lines' in general. Other researchers have remarked on the correlation to Alfvén waves to their occurrence in the earth's ionosphere (resonating at 3Hz to 5Hz), which is related to the psychotronic area of the Schumann Resonance, named after a German scientist brought to America under Project Paperclip, though credited to an Irishman, Fitzgerald. Although there are in these plasmas magnetogravity wave A magnetogravity wave is an acoustic gravity wave which is associated with fluctuations in the background magnetic field. In this context, gravity wave refers to a classical fluid wave, and is completely unrelated to the relativistic gravitational wave, see Gravitational Ahronov-Bohm effect in Ch. 9. Although, as we know the Alfvén Wave Grid would and does interact with gravity, thus producing gravitational waves, and one would also be able to interact with the Alfvén EM Grid, as explained by Norseen, with gravitational waves.

"In 1985 P.P. Belyaev ... discovered a resonant structure of electromagnetic noise at frequencies below the first harmonic of the Schumann resonance. It turned out that Alfvén waves in the ionosphere form an Alfvén resonator with an oscillation frequency that depends on the thickness of the ionosphere, the strength of the Earth's magnetic field and the concentration of ionospheric plasma particles... the resonant frequency of the Alfvén resonator varies within 0.5-3.0 Hz... the amplification of the Alfvén resonance phenomenon occurs at night, in the daytime the amplitude of resonance increases decreases to the values of ordinary noise... historical "adjustment" to the rhythms of the ionosphere..., synchronization of delta - and theta - rhythms with the frequencies of the Alfvén resonator, most likely, did take place"

The frequency of the delta-rhythm inherent in the state of sleep,  $F = 0.3-4.0$  Hz, indeed, in general, coincides with the ionospheric frequencies  $F = 0.5-3.0$  Hz. Is it possible to replace natural oscillations with generator waves of the same length? (Norseen Laurie 2002)

I am not aware of any working HFGW Surveillance at the time of Norseen's engineering work at Lockheed-Martin, it would be shortly after Norseen ended his work at Lockheed that Dr. Baker would write to the NSA regarding such technology. In interviews Norseen indicated a small local Radar system was to be deployed to do neural scanning of suspected terrorists at airports. As we know a gravitational signal receiver/transmitter can do the type of spectroscopy that was done with Radar alone before, but with added resolution. One other note in relation to Alfvén Waves is that they are usually associated with Solar plasmas, in the inner solar corona of Stars. It is known that during Solar Storms, vast EM discharges from the Sun that are shielded from the Earth by the Atmosphere, correlate with decreased 'psi' ability according to Dr. Persinger and earlier Russian studies, related to breaking the static conditions of the EM Field as rapidly increasing levels from solar coronal masses make their way to the Earth's Schumann Resonance or EM Field. Also, what the relationship to geomagnetic plasmas in the inner core of the earth may also have a relationship to Dr. Persinger's proposal to predict Earth Quakes based on EM discharges. Kravkov explains the relationship of Schumann Resonance, Alfvén Waves and Consciousness:

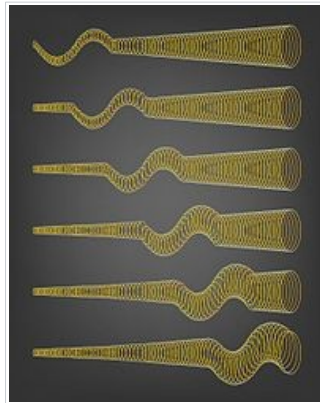
"It has been experimentally revealed that the brain, as an oscillatory system, has a high Q factor. With a simple forced resonance of a linear system with a high quality factor, the amplitude of the oscillations increases significantly only when the natural frequency and the frequency of the external influence exactly coincide ". The basic rhythms of the human brain are as follows:

- Delta - rhythm, rhythm of a sleeping person, sinusoidal,  $F = 0.3-4.0$  Hz;



- theta - rhythm, rhythm of a completely relaxed state and transition to a state of sleep, anesthesia, sinusoidal,  $F = 4-8 \text{ Hz}$ ;
- alpha - rhythm, the rhythm of a waking person, dominant in the occipital parts of the brain, is associated with the ability to abstract thinking, sinusoidal,  $F = 9-13 \text{ Hz}$ .

So it is easy to see from the research provided from Norseen, Persinger, Kravkov and others that there is a direct correlation to Electro-Magnetic Fields and Consciousness. How consciousness is affected by EM is part of the theory of Orchestrated Reduction.



Magnetic waves, called Alfvén S-waves, flow from the base of [black hole jets](#).

### Orchestrated Objective Reduction and Neuroweapons

As we've seen Dr. Norseen directly cites the work of Hameroff-Penrose on ORCH-OR as the model or physical explanation for Quantum Shift Keying, which is to say changing or monitoring the brain maps of a given target, thus directly affecting cognitive function of that brain targeted. ORCH-OR has also had its detractors, such as Stefan Koch. The most direct explanation of ORCH-OR was given by Hameroff in his 2014 paper:

'Orchestrated objective reduction' ('Orch OR') is a theory which proposes that consciousness consists of a sequence of discrete events, each being a moment of 'objective reduction' (OR) of a quantum state (according to the DP scheme), where it is taken that these quantum states exist as parts of a quantum computations carried on primarily in neuronal microtubules. Such OR events would have to be 'orchestrated' in an appropriate way (Orch OR), for genuine consciousness to arise. OR itself is taken to be ubiquitous in physical actions, representing the 'bridge' between the quantum and classical worlds, where quantum superpositions between pairs of states get spontaneously resolved into classical alternatives in a timescale  $\sim \tau$ , calculated from the amount of mass displacement that there is between the two states. In our own brains, the OR process that evoke consciousness, would be actions that connect brain biology (quantum computations in microtubules) with the fine scale structure of space-time geometry, the most basic level of the universe [Norseen's ZPE], where tiny quantum space-time displacements are taken to be responsible for OR. The Orch-OR proposal therefore

stretches across a considerable range of areas of science, touching upon the foundations of general relativity and quantum mechanics, in unconventional ways, in addition to the more obviously relevant areas such as neuroscience, cognitive science, molecular biology, and philosophy. It is not surprising, therefore, that Orch OR has been persistently criticized from many angles since its introduction in 1994. Nonetheless, the Orch OR scheme has so far stood the test of time better than most other schemes, and it is particularly distinguished from other proposals by the many scientifically tested, and potentially testable, ingredients that it depends upon. It should be mentioned that various aspects of the Orch OR theory have themselves evolved in response to scientific advances and, in some cases, constructive criticism. We here list some recent adaptations and developments that we have now incorporated into the theory.

### Cell and molecular biology

- Tubulin information states in Orch OR quantum and classical computation are now correlated with dipoles, rather than mechanical conformation, avoiding heat and energy issues. [Tubulin Information states are interacted with via Ahronov-Bohm potentials changing EM of Tubulin]

- Tubulin dipoles mediating computation and entanglement may be electric (London force charge separation), or magnetic (electron 'spin' states and currents) [spin is the basis of Soviet 'Thought Injection'], as presented in this paper.

- Enhanced electronic conductance discovered by Anirban Bandyopadhyay's group in single microtubules at warm temperature at specific alternating current gigahertz, megahertz and kilohertz frequencies ('Bandyopadhyay coherence', 'BC') strongly supports Orch OR.

- BC and Orch OR may well be mediated through intra-tubulin quantum channels of aromatic rings, like in photosynthesis proteins, plausibly for quantum computing in microtubules.

- Anesthetics bind in these tubulin quantum channels, presumably to disperse quantum dipoles necessary for consciousness.

### Brain science

- Alzheimer's disease, brain trauma and other disorders are related to microtubule disturbances; promising therapies are being aimed at BC in the brain.

- Scale invariant ( $1/f$ , 'fractal-like') processes at neuronal and network levels might perhaps extend downward to intra-neuronal BC in microtubules, e.g. megahertz excitations.

- Orch OR conscious moments, e.g. at 40 Hz, are now viewed as 'beat frequencies' of BC megahertz in MTs, the slower beat frequencies coupled to neuronal membrane physiology and accounting for EEG correlates of consciousness. The Orch OR proposal suggests conscious

experience is intrinsically connected to the fine-scale structure of space– time geometry, and that consciousness could be deeply related to the operation of the laws of the universe. (Hameroff, 2014)

Hameroff writing on the information processing ability of MT to represent boolean values:

Hameroff and Watt suggested that distinct tubulin dipoles and conformational states—mechanical changes in protein shape—could represent information, with MT lattices acting as two-dimensional Boolean switching matrices with input/output computation occurring via MAPs. MT information processing has also been viewed in the context of cellular (‘molecular’) automata (‘microtubule automata’) in which tubulin dipole and conformational states interact with neighbor tubulin states in hexagonal MT lattices by dipole couplings, synchronized by biomolecular coherence as proposed by Fröhlich [67–71]. Protein conformational changes occur at multiple scales [72], e.g.  $10^{-6}$  s to  $10^{-11}$  s transitions. Coordinated movements of the protein’s atomic nuclei, far more massive than electrons, require energy and generate heat. ....recent Orch OR papers do not make use of conformational changes, depending instead on tubulin dipole states alone to represent information. Within MTs, each tubulin may differ from among its neighbors due to genetic variability, post-translational modifications [73,74], phosphorylation states, binding of ligands and MAPs, and moment-to-moment conformational and/or dipole state transitions. Synaptic inputs can register information in dendritic–somatic MTs in brain neurons by metabotropic receptors, MAP2, and CaMKII, [Norseen’s Calpain] a hexagonal holoenzyme able to convey calcium ion influx to MT lattices by phosphorylation (Fig. 4 [64]). Thus tubulins in MTs can each exist in multiple possible states, perhaps dozens or more. However for simplicity, models of MT automata consider only two alternative tubulin states, i.e. binary ‘bits’. Another potential factor arises from the specific geometry of MT lattices in which helical winding pathways (in the A-lattice) repeat according to the Fibonacci sequence (3, 5, 8...) and may correlate with conduction pathways [75]. Dipoles aligned along such pathways may be favored (and coupled to MT mechanical vibrations) thus influencing MT automata computation. MT automata based on tubulin dipoles in hexagonal lattices show high capacity integration and learning [61].... Finally, MT information processing may be directly related to activities at larger scale levels of neurons and neuronal networks through something of the nature of scale-invariant dynamics. Several lines of evidence point to fractal-like (1/f) self-similarity over different spatio-temporal scales in brain dynamics and structure [76,77]. These are generally considered at the scale levels of neurons and higher-level neuronal networks, but may extend downward in size (and higher frequency) to intra-neuronal MT dynamics, spanning 4 or 5 scale levels over many orders of magnitude. MT information processing depends on interactive dipole states of individual tubulin proteins. What are those states, and how are they governed?”

In this technical explanation of information processing an important point is that “MT information processing depends on interactive dipole states of individual tubulin proteins”. Another important point he makes is that MT information processing is scale-invariant with fractal-like self-similarity. This is also seen not just in the Brain but also in the human eye where cones and rods match a Fibonacci sequence in an octagonal antenna for EM. This is also seen in DNA. Helical structures are also designed by Dr. Baker in his HFGW receiver/transmitter, using a double helix like DNA. Given that these structures may be scale-free fractal based patterns there may be a reason that the Retina Antenna is similar to Brain Information processing. The manipulation of MT dipoles may be the key in Norseen’s QSK. It is also important to note that the binary model was a toy model created for a simple explanation of information processing. If we are talking about Quantum Computation then we are probably talking about qubits or qutrits. A qubit reduces to 0 or 1 with a temporary superposition 0,1. A qutrit reduces to 0,1,2 with the superposed state maintaining it’s own state without a binary collapse, objective reduction. A final point regarding computation is that Hameroff-Penrose do not see human consciousness as something computable, rather they view it as non-computable, their colleague Badhyapadhyay has created a project, Artificial Brain (not AI), based on the resonant model of dipole switching (shifting) in MTs.

Hameroff goes into detail about the role of gravitation in the Objective Reduction, in a lengthy explanation, although necessary to understand, he writes:

In Penrose, the tentatively suggested OR proposal would have its onset determined by a condition referred to there as ‘the one-graviton’ criterion. However, in Penrose, a much better-founded criterion was used, now frequently referred to as the Diósi–Penrose proposal (henceforth ‘DP’; see Diósi’s earlier work, which was a similar gravitational scheme, though not motivated via specific general-relativistic principles). The DP proposal gives an objective physical threshold, providing a plausible lifetime for quantum-superposed states. Other gravitational OR proposals have been put forward, from time to time as solutions to the measurement problem, suggesting modifications of standard quantum mechanics, but all these differ from DP in important respects. Among these, only the DP proposal (in its role within Orch OR) has been suggested as having anything to do with the consciousness issue. The DP proposal is sometimes referred to as a ‘quantum-gravity’ scheme, but it is not part of the normal ideas used in quantum gravity... Moreover, the proposed connection between consciousness and quantum measurement is almost opposite [Copenhagen Interpretation, Heisenberg], in the Orch OR scheme, to the kind of idea that had frequently been put forward in the early days of quantum mechanics (see, for example Wigner) which suggests that a ‘quantum measurement’ is something that occurs only as a result of the conscious intervention of an observer. Rather, the DP proposal suggests each OR event, which is a purely physical

process, is itself a primitive kind of 'observation', a moment of 'proto-conscious experience'. This issue, also, will be discussed below. "

It is a very important distinction that Hameroff-Penrose are making here in terms of the reduction or collapse of the quantum wave into a fixed state. In the Copenhagen Interpretation the observer plays a role in collapse, in D-P the collapse has no 'conscious' element, it rather is based on the effects of gravity. In this sense of being a purely physical process alone, it is like P. Jordan's ideals, "there were times when a quantum system effectively observed itself, by collapsing into a specific state rather than remaining in a superposition of states. This does not need any "conscious observer," as had been argued by John von Neumann and Eugene Wigner, but it does need decoherence (and collapse) of the wave function that prevents further interference of various possibilities."

(<https://www.informationphilosopher.com/solutions/scientists/jordan/> [accessed 7/19/19])

Hameroff continues on the distinction of D-P quantum gravity:

"OR and quantum gravity Diósi–Penrose objective reduction (DP) is a particular proposal for an extension of current quantum mechanics, taking the bridge between quantum- and classical-level physics as a 'quantum-gravitational' phenomenon. This is in contrast with the various conventional viewpoints, whereby this bridge is claimed to result, somehow, from 'environmental decoherence', or from 'observation by a conscious observer', or from a 'choice between alternative worlds', or some other interpretation of how the classical world of one actual alternative may be taken to arise out of fundamentally quantum-superposed ingredients. The DP version of OR involves a different interpretation of the term 'quantum gravity' from what is usual. Current ideas of quantum gravity (see, for example, Smolin) normally refer, instead, to some sort of physical scheme that is to be formulated within the bounds of standard quantum field theory—although no particular such theory, among the multitude that has so far been put forward, has gained anything approaching universal acceptance, nor has any of them found a fully consistent, satisfactory formulation. 'OR' here refers to the alternative viewpoint that standard quantum (field) theory is not the final answer, and that the reduction R of the quantum state ('collapse of the wavefunction') that is adopted in standard quantum mechanics is an actual physical process which is not part of the conventional unitary formalism U of quantum theory (or quantum field theory). In the DP version of OR, the reduction R of the quantum state does not arise as some kind of convenience or effective consequence of environmental decoherence, etc., as the conventional U formalism would seem to demand, but is instead taken to be one of the consequences of melding together the principles of Einstein's general relativity with those of the conventional unitary quantum formalism U, and this demands a departure from the strict rules of U. According to this OR viewpoint, any quantum measurement—whereby the quantum-superposed alternatives produced in accordance with the U formalism becomes reduced to a single actual occurrence—is a real objective physical process, and it is

taken to result from the mass displacement between the alternatives being sufficient, in gravitational terms, for the superposition to become unstable. In the DP scheme for OR, the superposition reduces to one of the alternatives in a timescale  $\tau$  that can be estimated (for a superposition of two states each of which is assumed to be taken to be stationary on its own) according to the formula  $\tau \approx \hbar/E_G$ . An important point to make about  $\tau$ , however, is that it represents merely a kind of average time (Hameroff, 2014)

To abridge the above, rather than there being any kind of ‘conscious observer’ or environmental decoherence, the collapse or reduction is caused by the mass displacement between alternatives available which is given with:

$$\text{formula } \tau \approx \hbar/E_G.$$

This reduction is random and is given as an analogy to nuclear decay, occurring over a time series (t).

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*S. Hameroff, R. Penrose / Physics of Life Reviews 11 (2014) 39–78*

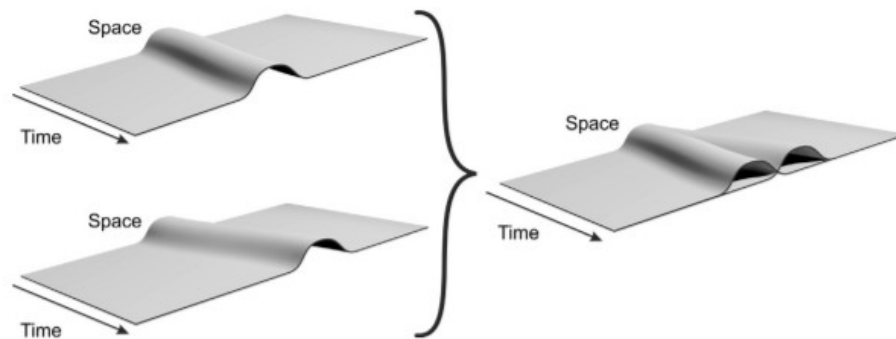


Fig. 8. Space–time geometry schematized as one spatial and one temporal dimension in which particle location is represented as curvature. Left: Top and bottom show space–time histories of two alternative particle locations. Right: Quantum superposition of both particle locations as bifurcating space–time depicted as the union (‘glued together version’) of the two alternative histories (adapted from Penrose [24], p. 338).

It is helpful to have a conceptual picture of quantum superposition in a gravitational context. According to modern accepted physical theories, reality is rooted in 3-dimensional space and a 1-dimensional time, combined together into a 4-dimensional [Minkowski] space–time. This space–time is slightly curved, in accordance with Einstein’s general theory of relativity, in a way which encodes the gravitational fields of all distributions of mass density. Each different choice of mass density effects a space–time curvature in a different, albeit a very tiny, way. This is the standard picture according to classical physics. On the other hand, when quantum systems have been considered by physicists, this mass-induced tiny curvature in the structure of space–time has been almost invariably ignored, gravitational effects having been assumed to be totally insignificant for normal problems in which quantum theory is important. Surprising as it may seem, however, such tiny differences in space–time structure can have large effects, for they entail subtle but fundamental influences on the very rules of quantum mechanics [92–95].

....

The degree of separation between the space–time sheets is a more abstract mathematical thing; it would be more appropriately described in terms of a symplectic measure on the space of 4-dimensional metrics (cf. [92,121]) but the details (and difficulties) of this will not be important for us here. It may be noted, however, that this separation is a space–time separation, not just a spatial one. Thus the time of separation contributes as well as the spatial displacement. It is the product of the temporal separation  $T$  with the spatial separation  $S$  that measures the overall degree of separation, and OR takes place when this overall separation reaches the critical amount. In the absence of a coherent theory of quantum gravity there is no accepted way of handling such a superposition as a separation (or bifurcation) of space–time geometry, or in any other way. Indeed the basic principles of Einstein’s general relativity begin to come into profound conflict with those of quantum mechanics [93,95]. Some form of OR is needed. The OR process is considered to occur when quantum superpositions between such slightly differing space–times take place (Fig. 9), differing from one another by an integrated space–time measure which compares with the fundamental and extremely tiny Planck (4-volume) scale of space–time geometry. As remarked above, this is a 4-volume Planck measure, involving both time and space, so we find that the time measure would be particularly tiny when the space-difference measure is relatively large (as with Schrödinger’s hypothetical cat), but for extremely tiny space difference measures, the time measure might be fairly long. For example, an isolated single electron in a superposed state (very low  $E_G$ ) might reach OR threshold only after thousands of years or more, whereas if Schrödinger’s ( $\sim 10$  kg) cat were to be put into a superposition, of life and death, this threshold could be reached in far less than even the Planck time of  $10^{-43}$  s. As already noted, the degree of separation between the space–time sheets is technically a symplectic measure on the space of 4-metrics which is a space–time separation, not just a spatial one, the time of separation contributing as well as spatial displacement. Roughly speaking, it is the product of the temporal separation  $T$  with the spatial separation  $S$  that measures the overall degree of separation, and (DP) OR takes place when this overall separation reaches a critical amount. This critical amount would be of the order of unity, in absolute units, for which the Planck–Dirac constant  $\hbar$ , the gravitational constant  $G$ , and the velocity of light  $c$ , all take the value unity. For small  $S$ , the lifetime  $\tau \approx T$  of the superposed state will be large; on the other hand, if  $S$  is large, then  $\tau$  will be small. To estimate  $S$ , we compute (in the Newtonian limit of weak gravitational fields) the gravitational self-energy  $E_G$  of the difference between the mass distributions of the two superposed states. (That is, one mass distribution counts positively and the other, negatively.) The quantity  $S$  is then given by:  $S \approx E_G$  and  $T \approx \tau$ , whence  $\tau \approx \hbar/E_G$ , i.e.  $E_G \approx \hbar/\tau$ . Thus, the DP expectation is that OR occurs with the resolving out of one particular space–time geometry from the previous superposition when, on the average,  $\tau \approx \hbar/E_G$ . The Orch-OR scheme adopts DP as a physical proposal, but it goes further than this by attempting to relate this particular version of OR to the phenomenon of consciousness. Accordingly, the ‘choice’ involved in any quantum state-



reduction process would be accompanied by a (minuscule) proto-element of experience, which we refer to as a moment of proto-consciousness, but we do not necessarily refer to this as actual consciousness for reasons to be described.

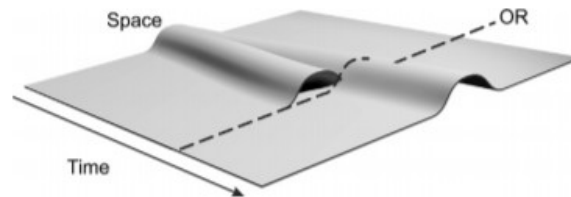


Fig. 9. As superposition curvature  $E$  reaches threshold (by  $E_G = \hbar/\tau$ ), OR occurs and one particle location/curvature is selected, and becomes classical. The other ceases to exist.

With such a simple mechanism of collapsing the wave function, rather than ‘observers’ or ‘decoherence’ we have a straight forward measure of reduction. In a later section Hameroff discusses the question of Quantum Computing in the Brain, this would correlate with the ‘cryptological’ QSK of Dr. John Norseen. A long passage which goes over QC in MTs is given by Hameroff:

5.1. **Quantum computing** in the brain Penrose [23,24] suggested that consciousness depends in some way on processes of the general nature of quantum computations occurring in the brain, these being terminated by some form of OR. Here the term ‘quantum computation’ is being used in a loose sense, in which information is encoded in some discrete (not necessarily binary) physical form, and where the evolution is determined according to the U process (Schrödinger’s equation). ... A proposal was made in Penrose [23] that something analogous to quantum computing, proceeding by the Schrödinger equation without decoherence, could well be acting in the brain, but where, for conscious processes, this would have to terminate in accordance with some threshold for self-collapse by a form of non-computable OR. A quantum computation terminating by OR could thus be associated with consciousness. ... Penrose and Hameroff teamed up in the early 1990s when, fortunately, the DP form of OR mechanism was then at hand to be applied in extending the microtubule–automata models for consciousness as had been developed by Hameroff and colleagues. ... the most logical strategic site for coherent microtubule Orch OR and consciousness is in post-synaptic dendrites and soma (in which microtubules are uniquely arrayed and stabilized) during integration phases in integrate-and-fire brain neurons. Synaptic inputs could ‘orchestrate’ tubulin states governed by quantum dipoles, leading to tubulin superposition in vast numbers of microtubules all involved quantum-coherently together in a large-scale quantum state, where entanglement and quantum computation takes place during integration. The termination, by OR, of this orchestrated

quantum computation at the end of integration phases would select microtubule states which could then influence and regulate axonal firings, thus controlling conscious behavior. Quantum states in dendrites and soma of a particular neuron could entangle with microtubules in the dendritic tree of that neuron, and also in neighboring neurons via dendritic–dendritic (or dendritic–interneuron–dendritic) gap junctions, enabling quantum entanglement of superposed microtubule tubulins among many neurons (Fig. 1).... In dendrites and soma of brain neurons, synaptic inputs could encode memory in alternating classical phases, thereby avoiding random environmental decoherence to ‘orchestrate’ U quantum processes, enabling them to reach threshold at time  $\tau$  for orchestrated objective reduction ‘Orch OR’ by  $\tau \approx h/E_G$ . At that time, according to this proposal, a moment of conscious experience occurs, and tubulin states [which would be Norseen QSK encoded] are selected which influence axonal firing, encode memory and regulate synaptic plasticity....the idea is that consciousness is associated with this (gravitational) OR process, but occurs significantly only when

(1) the alternatives are part of some highly organized cognitive structure capable of information processing, so that OR occurs in an extremely orchestrated form, with vast numbers of microtubule acting coherently, in order that there is sufficient mass displacement overall, for the  $\tau \approx h/E_G$  criterion to be satisfied.

(2) Interaction with environment must be avoided long enough during the U process evolution so strictly orchestrated components of the superposition reach OR threshold without too much randomness, and reflect a significant non-computable influence.

Only then does a recognizably conscious Orch OR event take place. On the other hand, we may consider that any individual occurrence of OR without orchestration would be a moment of random proto-consciousness lacking cognition and meaningful content. We shall be seeing orchestrated OR in more detail shortly, together with its particular relevance to microtubules. In any case, we recognize that the experiential elements of proto-consciousness would be intimately tied in with the most primitive Planck-level ingredients of space–time geometry, these presumed ‘ingredients’ being taken to be at the absurdly tiny level of  $10^{-35}$  m [Baker’s HFGW resolution] and  $10^{-43}$  s, a distance and a time some 20 orders of magnitude smaller than those of normal particle-physics scales and their most rapid processes, and they are smaller by far than biological scales and processes. These scales refer only to the normally extremely tiny differences in space–time geometry between different states in superposition, the separated states themselves being enormously larger. OR is deemed to take place when such tiny space–time differences reach the Planck level (roughly speaking). Owing to the extreme weakness of gravitational forces as compared with those of the chemical and electric forces of biology, the energy  $E_G$  is liable to be far smaller than any energy that arises directly from biological processes. OR acts effectively instantaneously as a choice between dynamical alternatives (a choice that is an integral part of the relevant quantum dynamics) and  $E_G$  is not

to be thought of as being in direct competition with any of the usual biological energies, as it plays a completely different role, supplying a needed energy uncertainty that then allows a choice to be made between the separated space–time geometries, rather than providing an actual energy that enters into any considerations of energy balance that would be of direct relevance to chemical or normal physical processes.

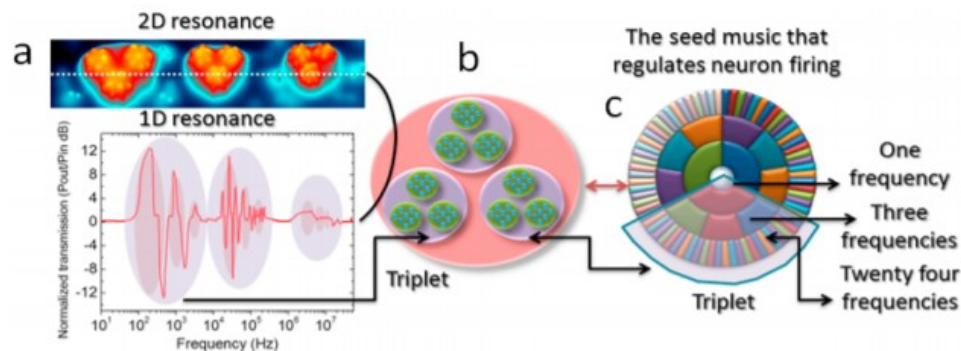
The previous depiction of Hameroff seems to confirm that it is indeed possible to have QSK targeted at the MTs of the brains neurons. One other pointer in the direction of confirmation of Quantum Consciousness is that Dr. Michael Persinger.

### **Electromagnetic Resonance of Microtubules**

Another colleague of Hameroff's that supports the ORCH-OR theory is the research scientist that works with physical materials at a Japanese Materials Science lab is Dr. Anirban Badhyapadhyay. There is a convergence between Dr. Persinger and Dr. Badhyapadhyay's research in studying the EM resonance of molecular materials. Both cite the work of Dr. Irene Cosic and her Resonant Recognition Model (RRM) which is an implementation of research carried out in the Soviet Union as early as the 1960s and earlier in Nazi Germany, Dr. Badhyapadhyay based his resonance research model on Cosic. Dr. Badhyapadhyay has found the following in studying Microtubules in which he examined tubulin, the MT and the Neuron with the same meterology used by Kernbach, Impedance Spectroscopy:

Here, we report a self-similar triplet of triplet resonance frequency pattern for the four-4 nm-wide tubulin protein, for the 25-nm-wide microtubule nanowire and 1- $\mu$ m-wide axon initial segment of a neuron. Thus, preserving the symmetry of vibrations was a fundamental integration feature of the three materials. There was no self-similarity in the physical appearance: the size varied by 106 orders, yet, when they vibrated, the ratios of the frequencies changed in such a way that each of the three resonance frequency bands held three more bands inside (triplet of triplet). This suggests that instead of symmetry, self-similarity lies in the principles of symmetry-breaking. This is why three elements, a protein, it's complex and neuron resonated in 106 orders of different time domains, yet their vibrational frequencies grouped similarly. Our work supports already-existing hypotheses for the scale-free information integration in the brain from molecular scale to the cognition. (Badhyapadhyay, 2020)

It is an interesting pattern that nanolength MT's have a 3 pattern to them like Protein Amino Acid synthesis using RNA.



**Figure 5.** Frequency wheel for the triplet-triplet resonance band (Movie 1): (a) 2D resonance of a single isolated microtubule from Figure 3a. A dotted line shows 1D resonance measurement location (top), the data are shown below panel (a). The 3D resonance plot of panel a is represented as a nest of nine circles (nine circles inside three circles inside one circle = 13 circles). Using a shadow and an arrow we connected a triplet in a 1D resonance plot of panel (a), with the schematic of panel (b); (c) The circular triplet-triplet plot of panel b is a replica of experimental resonance data (panel a), however, the resonant oscillations follow a periodic condition. If we apply periodic limits then panel b looks like panel c. One can find the triplet in panel c, each triplet has single frequency and its total period is sum of three frequencies inside, each of the three has periods of eight frequencies (a particular case of tubulin).

(Badhyapadhyay, 2020)

Divergence between self-similar and symmetrical energy resonance:

Similar to the microtubule and the neuron cell, we observed here triplet of triplet resonance bands (Figure 3c right). Normally, it was believed that electromagnetic resonance depends on the carriers, dispersion relation in a classic textbook would show how at different frequency regions, different carriers resonate. However, the classic dispersion relation presented in the textbooks, do not consider self-similar symmetry structures at all scales. (Badhyapadhyay 2020)

...

The axon core, microtubule and tubulin have self-similar bands, with a common frequency region, a similar structural symmetry governs the resonance in all the three systems. Helical distribution of neural branches, rings of proteins in the axonal core, spirals of proteins in the microtubule,  $\alpha$  helices in the proteins, are the common structures, and the resonant energy transmission in generic spiral symmetry follows a quantized behavior. Sahu et al. have patented this feature of microtubule as a new class of fourth circuit element. Hence, a spiral symmetry possibly ensures coupling of all the periodic oscillations (Badhyapadhyay, 2020)

An earlier finding of Dr. Bandyopadhyay was that the water channels inside microtubules were responsible for conduction of electrical signals which control the EM field within the microtubule. We shall read later in the work of Dr. Persinger that virtual particles (Norseen's ZPE) are a part of water Casimir effect, Bandyopadhyay remarks:

Water-extracted microtubule behaves like an insulator ... therefore, the interstitial water channel inside microtubule is solely responsible for the 1000 times more conductivity than tubulin.

The large tunneling current across 25 nm wide microtubule (insulator) is not via tubulin-water-tubulin route, the water core should act as a current source by storing charges. Dried microtubule does not show energy levels identical to tubulin protein, therefore, the water channel holds the proteins in a mechanism that does not allow splitting of energy levels of tubulins (Bandyopadhyay, 2013, 145)

The delocalization feature is responsible for four-probe unique conductivity, and automated noise management; again, delocalization disappears if water channel is removed. Then, at a higher bias 42 V, proto-filaments disintegrate in one scan. In the atomic force microscope (AFM) measurement, protofilaments do not break apart. In the AFM images, only helical tubulin rings are visible, while STM images show only longitudinal protofilaments, when water is inside, otherwise, it is a disintegrated mass of proteins. This suggests that the water channel controls micro-tubule's internal conductivity and force modulation. In TEM, both helical ring and longitudinal fringes due to the water channel are visible, if water channel is released the fringes disappear and rings split... (Bandyopadhyay, 2013, 145)

Bandyopadhyay provides a mechanism for Norseen's QSK in the following:

Microtubule exhibits a perfectly square hysteresis behavior (Fig. 4a,b) (Damjanovic, 2006), it means the dipole moments of tubulin proteins rotate synchronously by  $\pm 23^\circ$ , which plays a vital role in switching the conductivity or memory states. The hysteresis area increases with the maximum applied bias [or Ahronov-Bohm potential]... (Bandyopadhyay, 2013, 145)

4. Conclusions and Future Dielectric resonance frequencies of multiple proteins were mapped by applying two distinct kinds of electromagnetic fields one perpendicular to another. Such an orthogonal field-based splitting of energy exchange was never applied before to read the 2D interaction of the system profile over a large frequency range. Normally 1D transmission profiles are studied, the direction at which the input signal frequency is pumped along the same direction how much the carriers are pushed through is estimated as the response of the system. When a gating effect [EM Zeitgebers] is applied to all the three systems, additional dynamic feature hidden in the system is revealed by orthogonal fields. Such studies are regularly applied in transistor research. However, that is not the end. We speculate that if advanced further, it may be possible to map the higher-level dynamic features in the neuron, thus, we advance here the temporal correlations observed by Ghosh et al. and Agrawal et al. We have detailed how a 3D triplet of triplet band could be experimentally extracted from the

three systems, located one inside another. The tubulins are located inside microtubule and the microtubules are located inside a neuron, if the 3D band architecture is also self-similar, it would mean that the three systems could exchange geometric information conformally, i.e., without losing the angular features of the geometric shape over a time domain of  $10^6$  order in time scale. (Bandyopadhyay 2020)

The finding of a three level harmonic in the Tubulin is of interest as it relates to other harmonics also based on trinarities, such as that found in the Schumann Resonance, also reminiscent of Zeeman Splitting.

### **Michael Persinger Research on Consciousness**

As mentioned in the 'Physics and Neuroweapons' chapter Dr. Persinger was a research professor at Laurentian University. He duplicated earlier Soviet experiments in his labs, as well as interfaced with people attached to Stanford Research Institute. He investigated a research track that mirrors that of various military intelligence research labs throughout the world, with the caveat that his research was done with public funds at a parochial university working in the public interest. As such, he was never in a position to capitalize on his research as many other researchers in the field of neuroscience and physics have. As mentioned previously Dr. Persinger also concurred that ORCH-OR was a viable model for explaining Quantum Consciousness. He gives a very technical consideration to the issue:

The quantity of energy  $10^{-20}$  J has direct application to the neuroquantum approaches to consciousness. The most popular is the "collapse of the wave function" as cogently articulated by Hameroff and Penrose. Their recent articulate article entitled "Consciousness in the universe: a review of the 'ORCH OR' theory" reviews the essential concepts. The dichotomy of the existence of the electron as a particle or a wave within space is reflected by its classical width, of about  $2 \cdot 10^{-15}$  m and its Compton wavelength,  $10^{-12}$  m, derived from quantum concepts. Although there are several interpretations for this discrepancy, what is important here is that the discrepancy in length according to the Lorentz contraction requires a specific discrepancy between the speed of light ( $3 \cdot 10^8$  m·s<sup>-1</sup>) and some very negligible value less than that velocity.

The difference in energy equivalence for the electron at the velocities that would accommodate the Lorentz contraction is in the order of  $10^{-20}$  J. This could suggest that the increment of energy required for the "collapse of the wave function" is congruent with the quantum increment associated with a single action potential. By extension, millions of action potentials would affect millions of these functions. That the action potentials from only *one* neuron could affect the global state of the entire cerebral cortices has been reported by Li *et al.* Energies in the order of a few increments of  $10^{-20}$  J have been shown experimentally to alter the probability of an overt response. (Persinger, 2015c)

He takes the ORCH-OR theory one step further by suggesting that the reduction of the wave form is able to be performed by a 'single action potential' which can alter the state of the whole brain, he identifies a measure of the energy behind this potential as  $10^{-20}$  J. Which he then points out that these

potentials are “Energies in the order of a few increments of  $10^{-20}$  J have been shown experimentally to alter the probability of an overt response”. Indeed, this would seem to confirm to some degree the claims of Dr. John Norseen of altering brain behavior with Thought Injection. It is also worth noting that responses are ‘probabilities’ not deterministic.

### **Casimir and Consciousness**

As seen from the work of Dr. Norseen, he notes the role of the Casimir Effect in generating Brain Waves such as Alpha at 7Hz, etc. Noting as we are talking about a Biological entity it necessarily has a large portion of water as it's constituent parts. It is easy to overlook this most basic element of all biological entities for the last 3.5 Billion years of evolution on this planet. As noted in the work of direct supporters of ORCH-OR in the work of Bandyopadhyay MT water controls EM which gives a product, memories or what the more technical community calls Semi-states. It is also important to note where ideals of the Casimir Effect and Consciousness come from originally, of which Dr. Persinger's work replicates and also provides original methodologies and insights to work conducted in the Soviet Union directly under the sponsorship of the KGB, so obviously of importance to weapons and possibly even propulsion systems for ICBM, Star Wars, etc. The question is where did the Soviets get their ideals regarding the importance of these things? It is noted that German Nuclear Engineers were brought to the Soviet Union, part of that work was the creation of Heavy Water, so obviously they would have understood a thing or two about the Casimir Effect and it's role in heavywater, one would assume any nuclear engineering team anywhere would. It is also noted by Dr. Kernbach (2014), that alleged Psychotronic experiments were conducted at German run Soviet Nuclear Weapons labs in the 1950s for instance in Sukhumi under Hertz, who also worked with von Ardenne who in the 1930s conducted research with reading brains in his research institute, who also was a Nuclear Engineer held in prison in the Soviet Union after the war working on their nuclear program.

The Casimir Effect deals with the occurrence in a Classical scale quantum effects in vacuum fluctuations and their transition into virtual particles. Virtual particles:

In the realist narrative, virtual particles pop up when observable particles get close together. They are emitted from one particle and absorbed by another, but they disappear before they can be measured. They transfer force between ordinary particles, giving them motion and life. For every different type of elementary particle (quark, photon, electron, etc.), there are also virtual quarks, virtual photons, and so on. (Rorvig 2020 )

For sake of consistency with the frame of reference of Persinger he gives the following definition of virtual particles and their significance:

The space occupied by brain would be subject to the complex possibilities of the multidimensional spaces of Kaluza-Klein as well as the potential energy contained within the structure of space. Matter, defined as protons and electrons, occupy spaces of  $\sim 10^{-15}$  m.



Between this level of discourse and the smallest conceptual increment of space, Planck's Length ( $\sim 10^{-35}$  m) [resolution of HFGW goes down to  $10^{-37}$  m], there are inordinate degrees of freedom whose structures could contain latent energy .

The boundary of "the smallest space" which has been considered Planck's Length ( $1.62 \cdot 10^{-35}$  m), includes the "virtual particles" of the zero point potential of vacuum energies. They are functionally a modern equivalent of the 19th century concept of "ether" or universal medium. These virtual particles exhibit zero point fluctuations or *Zitterbewegung* which endow the property of "process" or a change as a function of time. Within these point fields, a changing electromagnetic boundary has the capacity to transform virtual particles, through Casimir processes, to "real" particles. Real particles are protons and electrons with the capacity to mediate local causality. Virtual particles would have the capacity to mediate "non-local" causality. (Persinger, 2015)

There are several aspects to this understanding of virtual particles that are worth recollecting: 1. the brain interacts with hyperdimensions (Kaluza-Klein), 2. Quantum is associated with the Planck length, this is the level of existence of virtual particles, and hence the Casimir Effect, though possible to see in the Classical world, an immanence of quantum existence, that engineers can work with. How all this relates to consciousness is best given in an overview of the significance of the Casimir Effect, and other EM effects Persinger gives the following:

The explanations for the absolute nature of consciousness have been distributed historically along a continuum that ranges from extreme materialism to idealism. Consequently, the fundamental operations of most philosophies range from the assumption consciousness is determined by the physical laws of matter and energy to energy and matter as being constructs or "creations" of consciousness. Within the quantum domain that includes Casimir phenomena whereby virtual particles can be transformed under optimal conditions to particles with mass, there are other perspectives. The perspective developed in this paper is that consciousness is a boundary condition between a singularity (black hole) and space within the brain [hippocampus]. ... One traditional approach to pursuing the validity of concepts that are difficult, but not impossible, to verify experimentally is to pursue the consistency of the quantitative solutions that relate central components to the theory. We assume here that the central mass unit associated with the physical bases of the phenomena that define our reality is the simplest complex of a proton and an electron, the hydrogen atom. Metrics related to these phenomena should be related in a meaningful and systematic manner to the key parameters that occur at the level of the synapse and the neuronal plasma membrane ion channel as well as the values that define the boundaries of our current concepts of the smallest ( $\sim 10^{-35}$  m) and largest ( $\sim 10^{26}$  m) spaces.

Elaborating further:

The human brain is the matter within a volume that may contain properties that facilitate the transformation of virtual particles existing at the level Planck's length to actual matter. As indicated by Bordag et al. an infinite vacuum energy of quantized electromagnetic field in free Minkowski space can be shown to allow a finite force between two parallel neutral plates. This Casimir force involves the existence of zero-point oscillations which are associated with the point values of a quantized field. Boundaries composed of matter polarize the vacuum of a quantized field. The energy over distance is a consequence of the result of vacuum polarization by an external field. One of the possibilities of vacuum quantum effects is the creation of particles from the vacuum by external fields. Energy is transferred from the external field to virtual particles or vacuum oscillations, much like Eddington's formulation, to produce real particles. However this effect of transformation requires the boundary condition to be a function of time (time varying) rather than static conditions. In other words, a transformation of the state of particles occurs when there is a changing electromagnetic field that contributes to or defines a boundary condition. The degrees of freedom for this potential are markedly enhanced by the unique property of attraction or repulsion depending upon the geometry and topology of the quantized manifold or shape. The recursive, changing electromagnetic fields, much like a classical tensor, that occurs within synaptic space and across the cerebral cortical manifold during the ~20 ms "recreation" of consciousness, could be preconditions to allow this virtual-to-matter transitions. The synapse, the primary interface between two neurons, is effectively two plates where the width is much larger than the separation between the apposing boundaries of a Casimir condition. These "plates" are in the order of 1,000 to 2,000 nm wide and are separated by 10 nm. Assuming a width of 2  $\mu\text{m}$  (an area of  $4 \cdot 10^{-12} \text{ m}^2$ ), the Casimir force during discrete intervals of neutrality between the "plates" or boundaries would be about 0.5 microNewtons. When applied across the 10 nm synaptic cleft, the energy would be  $14 \cdot 10^{-14} \text{ J}$ . The frequency equivalence of that energy, when divided by Planck's constant ( $6.624 \cdot 10^{-34} \text{ J}\cdot\text{s}$ ), is  $.078 \cdot 10^{20} \text{ Hz}$ . The equivalent wavelength, assuming  $c$  is the velocity of light in a vacuum is  $3.8 \cdot 10^{-11} \text{ m}$  or 38 pm. This length is within error measurement of the width of the neutral hydrogen atom. Such convergence would be expected between Casimir transformations from virtual to real particles and the component that composes 90% of the matter in the universe. Hydrogen is the essential unit by which aggregates of heavier elements are formed. (Persinger, 2013)

Returning to Bandyopadhyay work on demonstrating virtual particles affect conduction and EM patterns in Microtubules through waters and brain EEG rhythms, which is to say Consciousness, it is important to understand the role of the Casimir Effect in terms of water. Persinger has studied the role of Casimir Effect of thixotropy of water (relating to viscosity), and in more general terms in entangled states, between two non-local water samples united by a changing velocity EM field, through a local

device (a circular poynting vector emmitter) which was also used by Kernbach (2017b) were he cites Akimov generators as the basis of their usage, they being circular versions of the Akimov generators. Serge Kernbach replicated earlier Soviet experiments on distant influencing on biological organisms. The original experiment of A.E. Akimov was conducted in 1986, and released in 2001 regarding distant influencing before going into the experimental results and setup of this replication we will first review the history of this research with secret intelligence such as the KGB, which would eventually lead to leading Soviet experts moving west to work for western intelligence agencies. Kernbach notes of the original experiment, it was mainly investigating the disturbance of biological rhythms by long-term non-local impact and possible neurological manifestations. Noting it's connection to the KGB Kernbach writes:

The work [originally from 1986] was published in 2001 and caused extensive controversy in the press. It reported about the performed in 1986 experiments on a nonlocal impact on biological objects over 22km distance, the article pointed out that 'advancement in this area was made possible through the support of the KGB of the USSR and the USSR's Council of Ministers'. In it is explicitly stated 'all reports even on works with the Ministry of Defense of the USSR were not classified'. According to the biography of A.E.Akimov, he worked in 1977-1983 in the Moscow Research Institute of Radio Communication and in 1983-1987 in the research institute of communication and control systems. This explains the telecommunication methodology and terminology that are used for conducting those attempts. Indeed, modern experiments on quantum communication confirm his vision and approach (Kernbach, 2018b)

The original ideal for these experiments can be traced back to 1982 by V.A. Sokolova. Kernbach also notes the CIA's interest in this research were it is known as 'Remote Action':

The description of the experiment from 1986 indicates that 'a bioelectronic system was used as a torsion [Ahronov-Bohm effect] receiver. It is based on the property of tissue cells to change the conductivity of membranes when exposed by a torsion field [vacuum virtual particles created with potentials]. This property was implicitly established by V.A.Sokolova in 1982'. The use of biological objects (in this case plants) for technical communication systems is surprising. The approach developed by V.A.Sokolova (several those methods were confirmed in our laboratory) used a simplified impedance spectroscopy applied to fluidic systems. Cellular tissues were only one of many tested systems, they are characterized by unstable electrochemical properties. In later works of the ISTC VENT, for example of A.V. Bobrov, water was used as a physical receiver of nonlocal signals. Another interesting point, related to this experiment, is the widely debated resolution of the Council of Ministers of the USSR, that allegedly was about 'managing living objects'. It also dates back to 1986 and was mentioned by E.B.Aleksandrov. Finally, our attention was attracted to works on interaction with biological systems that were carried out at that time, whose traces can be found in the press. Therefore, the question faced by the thoughtful reader is whether the experiments of 1986, under the patronage of the KGB, were first test experiments on nonlocal influences on biological objects. Such an interpretation could explain the motivation of transmitting signals in a slow

'communication channel' with only a few bits per hour, that has no technical sense but a lot of biological implications. This could also explain the interest of intelligence services of different countries in these technologies, for example, the CIA called similar methods as 'Remote Action', the beginning of their research falls also on 1986-1987. (Kernbach, 2018b)

Although, they were not the first tests of remote influencing, it is illustrative to see the history behind these generators used in the experiments. Akimov and also Bobrov mentioned in these passages both had experience working secretly for the Soviet secret intelligence services. Akimov's generators became public in the mid-1980s much later than their military and intelligence development extending to at least the 1950s. Akimov himself started in this field in 1959 working for the KGB scientific labs that studied remote influencing of biological objects, such as white rabbits (Zhigalov, 2009).

In 1961, a young A.V. Bobrov is sent to the Baltics to study fields associated with psychics, his first foray into detectors and transmitters, later A.V. Bobrov is doing classified work on 'remote consciousness' from 1989-91 (Kernbach, 2019) he again worked on secret projects for the military and intelligence sector of the Soviet Union, Bobrov in a discussion reported about studies performed at Gagarin Air Force Academy in Monino and by St. Petersburg L.I. Mechnikov State Medical Academy in the 80s and 90s. (Kernbach, 2013, 17) Bobrov in 1964 returned to graduate school looking for a theory to explain the energetics associated with his classified psi work from 1961. He later, according to the public story, came across the work of Akimov, then formulating the ideal of 'information radiation'. He today continues working on projects with open researchers such as Russian researcher at the University of Stuttgart Serge Kernbach. Among the innovations that Bobrov brought to the field, aside from Medical Treatments, is the question of detection and sensing or metrology. For instance the question becomes to change a thought you have to have the map of the thought as Dr. Norseen put it. Kernbach writes of Bobrov's innovation of the electric double layer in sensing:

"In 1988 the first note of A.V. Bobrov about the electric double layer (EDL) as a sensor had appeared. In his book, he confirmed the program of the USSR's Ministry of Defense on the study of psychics and instrumental psychotronics. Bobrov's EDL sensors have been proven as very sensitive devices. The book edited by Lunev describes the work carried out at the Tomsk Polytechnic University from 1983 to 1993, including a number of sensors based on quartz resonators and detectors of radioactivity. In 1989 a patent of G.A. Sergeev on capacitive sensors is issued. Since 1989 various tests with crystallized structures are conducted and, further, with the melting of metals. Attempts were made to develop sensors on that basis. In the early 90s sensors of Y.P. Kravchenko appeared (Ю.П.Кравченко), based on measurements of electric fields. In the Institute of Physics, St. Petersburg State University, the results related to Kozyrev's sensors are verified (these and other works have stimulated the development of solidstate sensors). The book of G.N. Dulnev and colleagues describes the research conducted between 1995-1998 at the Center for Energy and Information Technologies at the St. Petersburg State Institute of Fine Mechanics and Optics (TSEIT GITMO). In those experiments more biological, optical, magnetic and thermal sensors are used. Interesting works are performed on bioelectrogenesis of plants and the application of such sensors in experiments. By 2000, there is already a large amount of works on the impact of 'high-penetrating' radiation on different semiconductor devices, see e.g. In the review in 2013 related to metrology of 'high-penetrating' emission, there are 19 groups of physical effects that can represent a basis for the development of sensors, with dozens of technical sensors." (Kernbach, 2013)

The question as to where Akimov learned of these technologies can be traced back to at least the 1920s. While Kernbach has argued that Vril generators (the Nationalist Socialist idea of 'prana' or 'ruah', spirit) possibly date back to 1913 may be early versions. This is no coincidence as Kernbach has traced the production of these generators was a direct outcome of Nazi war research and possible deployment in Germany during the war. The German aristocrat **Manfred von Ardenne**, who later was taken to the Soviet Union as a captive scientist working on their Nuclear program, before the war was known to work with reading brainwaves in his self-funded research institute, Ardenne wrote.

the high-frequency field is nothing in thinking, to perceive the electricity, amplify with tube amplifiers, and transfer this enhanced energy to the second brain. So that in the second brain there are we have the same thoughts, it is necessary that with a variety of thinking, an amplifier of produced broadband frequency very uniformly... (Kernbach, 2014, part 2)

Kernbach notes:

Ardenne and Hertz worked in Soviet Georgia (Max Steenbock was the developer of the first Betatron), in Georgia, we also find traces of early psychotronic works. According to eyewitnesses, back in the 50s research works were carried out in Agudzer on hypnosis and ultra-weak radiation of biological organisms... there is a description that AEG supplied equipment for secret projects such as Colocation [instrumental remote viewing]. The authors indicate that German specialists from the AEG-Röhrenfabrik Oberspree, where the high-frequency technology of the war was harnessed, took part in the formation of Research Institute 160, later Research Institute Istok. (Kernbach, 2014)

In addition to this Kernbach has cited the Soviet Armies discovery of special antennas that resemble the design of Akimov generators including klystrons, ray tubes, and other items related to highly penetrating radiation generation, Kernbach concluded regarding the various electronic finds from Nazi Germany: "These strange phenomena suggest that that the objects under study are somehow possible acted on the morale of the German units and the civilian population." (Kernbach, 2014).

Kravkov further elaborates on the connection of Nazi research to Soviet psychotronics beginning with the find under the Reich in Berlin and examination by Soviet engineer Devyatkov gave this account:

I took up my duties for Deputy Director for Scientific Affairs (Research Institute-160 Source) from May 15, 1948 ...Institute was very broad. In terms of time work was listed not only microwave devices, but also electron-beam devices, generator and modulator lamps, kenotrons, type raytrons, gas-discharge stabilizers, resonators resonance arresters, receiving-amplifying lamps. The range of microwave devices included many other classes: magnetrons of continuous and **pulse action**, generator klystrons and amplifying, reflective heterodyne klystrons, traveling wave tubes – input and medium power, backward wave lamps, amplitrans and other M-type amplifiers. Interestingly, in another interview we find Devyatkov and backward-wave lamps in completely different research Institute Istok: The seminar was delivered on the initiative N. D. Devyatkov - Corresponding Member of the Academy of Sciences USSR, scientific director of the Research Institute of Electricity (Fryazino, Moscow region - Author) and blowing department 16 Ultrahigh frequency electronics IRE AN USSR. Reverse lamps Noah waves gave the opportunity to start work in unconventional for radio electronics in biology and medicine. The first very interesting experimental results, delivered at

the suggestion of N.D. Devyatkov and M.B. Golant, were obtained in 1965, when the resonant response was established out biological objects when exposed to on them with discrete millimeter waves range [microwaves]. Other sources, for example, indicate that high-frequency equipment SRI Istok used was called in torsion [Ahronov-Bohm effect] studies of the 80s and 90s. Obviously, these and other facts allow the possibility that there is a connection between the German and Soviet unconventional developments. (Kravkov, 2006)

It may seem like there is insufficient evidence from the accounts of N.D. Devyatkov But it is interesting that later in his career he began experiments with the effects of millimeter wave technology which may correspond to the Nazi find he was asked to backwards engineer in 1948. It is important to remember in the 1930s Mikhailovich was already researching in this area of microwaves effect on the brain. A Russian researcher, Kravkov, remarks regarding this development in N.D. Devyatkov Research:

“The problem [influencing biological objects with waves] was born in the early 60s of the twentieth century as "the idea of the possibility of a specific effect of electromagnetic radiation of the MM (millimeter, 10 mm at 30 GHz decreasing to 1 mm at 300 GHz.) wavelength range on biological structures and organisms", was expressed by Soviet scientists (ND Devyatkov, MB Golant and etc.).

This is how the participant in the events, Professor O.V., spoke about the first step towards testing the hypothesis (3). Betsky: “In September 2003, 40 years have passed since the IRE of the USSR Academy of Sciences... a scientific seminar devoted to the discussion of the unusual properties of low-intensity electromagnetic fields of the millimeter (extremely high-frequency - EHF) range in relation to the processes of biological organisms functioning. By this time, the Istok Scientific Research Institute of the Ministry of Economic Development of the USSR ... completed research work on the development of the world's first broadband millimeter wave generator based on vacuum devices - backward wave tubes with a longitudinal magnetic field (LOV-O). The seminar was staged at the initiative of N.D. Devyatkov - Corresponding Member of the USSR Academy of Sciences, scientific director of the Research Institute "Istok" (Fryazino, Moscow region - Auth.) And head of department 16 "Ultrahigh-frequency electronics" of the IRE of the USSR Academy of Sciences. Backward wave lamps made it possible to start work in an unconventional direction for radio electronics - in biology and medicine. "

The first very interesting results of experiments set up at the suggestion of N.D. Devyatkov and M.B. Golant, were obtained in 1965, when the resonant response of living biological objects was established when exposed to discrete waves of the millimeter range.

Almost simultaneously, at the other end of the Soviet Union, in Novosibirsk, V.P. Kaznacheev, S.P. Shurin, L.P. Mikhailova discovered a no less interesting “Phenomenon of intercellular distant electromagnetic interactions in the system of two tissue structures”. (Kravkov, 2006)

To show the important connection that the Akimov generator research served, as it was directly connected to the remote influencing of biological objects, Kernbach points out that at the highest levels of Soviet Government work involving remote influencing were reviewed citing Maj. Gen. Ratnikov:

“this area – research on the one side [USSR] stimulated equivalent studies on the other side [UKUSA]. Some representatives of ‘power structures’ in the Soviet Union so characterized the 80s: ‘In general, in 80s, in this country, it was created a system of well-organized and conspiratorial work to develop new methods and means of resolving interstate and internal political problems without involving intimidating power forces and damaging effects [NATO doctrine of non-lethal weapons begun during Clinton Administration]. It includes methods of obtaining timely information, other than the traditionally known’.

(Kernbach, 2013, Interview of the head of Energy and Information Laboratory Russian NAST Academy Major General FSO B.K.Ratnikov (Б.К.Ратников) to the magazine ‘Security’ on August 29, 2010)

It is hard to imagine any different reason from the totalitarian Nazi regime, that the totalitarian Communist regime sought to use this technology for the same reasons:

“Since the mid-80’s the central coordinator of unconventional research became the State Committee for Science and Technology at the Council of Ministers (SCST USSR) with the direct participation of the Ministry of Defense and the KGB. In the middle of 1986, N.I.Ryzhkov (Н.И.Рыжков) on a memo about the perspectives of torsion technologies wrote a resolution: ‘Take steps to organize the works’. Many authors point to the classified document by the Central Committee of the CPSU and the USSR Council of Ministers N137-47 of 27 January 1986 about the program ‘Management of living objects, including human’. For obvious reasons, the text of this resolution is not in the public domain, but this document has several indirect evidences.” (Kernbach, 2013, 12)

As far as the technological development Kernbach notes that these generator designs were already completed a decade earlier in the 1970s, although it is possible they are directly taken from Nazi Germany, apparently in secret Soviet labs under sponsorship of the KGB and Ministry of Defense, which seems to have begun this work as a direct corollary to the Nuclear Weapons program of the 1950s of which many German scientists were involved, like Zimmer, Hertz and von Ardenne. It is possible they were disclosed in the mid-1980s to attract more research or that these particular designs, were antiquated, but their circulation as devices would be valid in academic contexts even if the design itself is antiquated and replaced with a new version of the technology such as lasers of LED based devices, in the mid-90s Bobrov switched from Akimov generators to Quantum Generators (lasers, LED). As is usual there was much suppression of Akimov and the research community following the fall of the Soviet Union. In 1991, Akimov and the research of Torsion Fields’ were declared ‘pseudoscience’ by the presidium of the USSR’s Academy of Science, which in one week went from funding Akimov and the Center for Unconventional Technologies, and a week later declaring such research ‘pseudoscience’, Kernbach has written this off as jealousy over funding of research, while Russian researcher Zhigalov finds a direct military deception reasoning behind the labeling of this technology as ‘pseudoscience’:

“Somewhere in the beginning 80s (and maybe even earlier), he [Akimov] discovered the mutual influence of disunited rotating bodies. The report of these studies was classified. It seems that Akimov’s work was initiated by these studies. It is possible that the main achievements of Akimov are classified. Maybe exactly therefore in VENT publications there is very little directly torsion topics, especially publications with detailed descriptions of experiments. I am quite even admit that the whistle about ‘pseudoscientific’ torsion research is



specially organized as a 'disinformation' for hiding very important achievements. But this is just an unreliable hypothesis." (Zhigalov, 2009)

This was all just previous to the end of the Soviet Union, after the fall of the Soviet Union funding dried up for Akimov and his center, VENT, though active work continued into 1995, after that period support became sporadic, with Akimov trying to continue VENT into 2001. VENT was organized into 5 research areas: communication, material research, new sensing technologies (e.g. for forecasting earthquakes), water cleaning and medical diagnostics. All psychotronic research stopped in 2002-2003, which was also around the time of the murder of Brushlinsky (Jan, 2002), the first creation of 'Thought Injection' in the US, basically most Russians with expertise in this field went west or carried on meagerly developing their own private funding sources, never with any serious money behind them. Sokolov notes that some Torsion scientists went to England as well around the time of the fall of the Soviet Union (Sokolov, 2016). An example of the ending of Psychotronics programs in Russia was the closing of the military unit 10003 in 2003 which was established in 1989 to explore the possibilities of military use of paranormal phenomena. While during this period Academics that had previously been doing solid scientific work in this area decided not to carry on this work fearing for their academic positions at Universities in Russia by being labeled as 'pseudoscientists' (Kernbach, 2013). One interesting point regarding the generators used by Akimov, for instance he did not use Okatrin's generator, though similar, or include other Theoretical Physicists work such as A.G. Gurvich or B. Kobozev due to their ideals being 'Old', like Okatrin's microlepton theory.

Kernbach has studied the Soviet 'Torsion' generators produced by the likes of Akimov, Oktarin (Анатолий Федорович Охатрина d. 2002), Deev, and others (Kernbach, 2015). Later, we shall examine the physics behind these generators or antennas and it's use of the Ahronov-Bohm effect. It is revealing that in a document dated from July 22, 1991 an interview was held with a Russian scientist, Oktarin, by the CIA during the collapse of the Soviet Union. The CIA interviewed Oktarin and was evidently interested in his inventions Neuroweapons abilities:

SEQUENCE NR: CSB91500553 USER- [REDACTED] ID: 24090-91JUL22/17.06.01/A10

CAMERA WITH AN ATTACHMENT WHICH CONVERTS MICROLEPTON RADIATION INTO OPTICAL RADIATION). THE INTERVIEWER WAS SHOWN PICTURES WHICH OKHATRIN SAYS WERE PRODUCED BY MICROLEPTON RADIATION FROM THE SUN AND A HEATING AND POWER PLANT. IT IS CLAIMED THAT INTENSE MICROLEPTON RADIATION CAN AFFECT THE HUMAN NERVOUS SYSTEM, IMPAIRING LOGIC, SPATIAL ORIENTATION AND THE FUNCTIONING OF ORGANS. FATAL CONSEQUENCES ARE POSSIBLE.

MEDICAL DIAGNOSIS AND WEATHER MODIFICATION ARE MENTIONED AS POSSIBLE FIELDS FOR THE PRACTICAL EMPLOYMENT OF MICROLEPTON TECHNOLOGY. OKHATRIN RELATES THAT HE AND COLLEAGUES HAVE CONTROLLED RAINFALL WITH THE AID OF SUCH EQUIPMENT. IN SARATOV, MICROLEPTON GENERATORS HAVE BEEN USED TO REDUCE THE DUST CONTENT OF THE ATMOSPHERE AND PURIFY NEARBY BODIES OF WATER. ASKED ABOUT THE POSSIBILITY OF BUILDING MICROLEPTON DEVICES FOR DESTRUCTIVE PURPOSES OR ENSLAVING OTHERS, OKHATRIN ACKNOWLEDGES THAT SUCH A POSSIBILITY EXISTS. HE BELIEVES THAT THIS PROBLEM IS BEING STUDIED IN WESTERN COUNTRIES. OKHATRIN THINKS THAT EXPERIMENTS IN THIS FIELD SHOULD BE FORBIDDEN. ISKAKOV QUOTES THE FOLLOWING PASSAGE FROM AN ANTHOLOGY ENTITLED PROBLEMS OF STATISTICS AND ECONOMETRIC MODELING (PROBLEMY STATISTIKI I EKONOMETRICHESKOGO MODELIROVANIYA), WHICH WAS PUBLISHED IN MOSCOW IN 1987: A LEPTON PACKET (LEPTON CLOUD) CAN BE A MATERIAL MEDIUM. IN COMBINATION WITH DATA FROM A. F. OKHATRIN, SOLUTION OF AN EQUATION FOR LEPTON GAS MAKES IT POSSIBLE IN PRINCIPLE TO WEIGH HUMAN THOUGHT TO WITHIN  $10 \times 10^{-35}$  TO  $10 \times 10^{-32}$  GRAMS. TWO PHOTOGRAPHS OBTAINED IN OKHATRIN'S LABORATORY BY MEANS OF MICROLEPTON RADIATION ARE GIVEN.

(CIA, 1991)

Oktarin hypothesized during an era when many outside of secret government labs had given up on gravitational waves and any normal EM wave explanations for the effects they were encountering in their labs came up with the theory of microleptons, so that we now understand when he refers to microleptons he is really referring to the well founded physics of the Ahronov-Bohm effect, not some new pseudoscientific 'Torsion physics' or 'microleptons'. The camera mentioned in the text was created in 1989 it is a photometric method for recording energy fields using digital scanning and optical devices [see Ch. 9B] was developed at the Torsion Laboratory of the International Academy of Medical and Technical under the leadership of G.F. Saveliev working with Oktarin. A brief review of Oktarin's biography reveals some interesting relationships:

Okhatrin Anatoly Fedorovich, Academician of the International Academy of Energy Information Sciences, Head of the Biolocation Laboratory and the Institute of Mineralogy, Geochemistry and Crystal Chemistry and Rare Elements (ITGRE), developer of biogenerators (академик Международной академии энергоинформационных наук, руководитель лаборатории биолокации и института минералогии, геохимии и кристаллохимии и редких элементов (ИТГРЭ), разработчик биогенераторов.). <https://spaevgev.livejournal.com/44962.html>

From 1953 he worked in the design bureau of academician A.P. Korolev in Novosibirsk [Kozyrev also worked there on his 'torsion' theory based on 'Causal Mechanics' with time as a particle], where devices were developed that affect human energy, which is interesting since most in the west credit such work to Pavlita, but it seems to also have been investigated by the Soviet rocket scientists, literally rocket scientists. Keeping in mind that Tsiolkovsky, credited with the founding of the Russian space program, himself was haunted and also believed psi technology would bring a great leap forward in space exploration. Early in Oktarin's career he is already investigating biological influences in an official Soviet government lab. His mentor, Korolev, before designing the rockets that launched Sputnik and the first manned mission, was working on biological effects of remote action, this after having been arrested and sent to the Gulag in 1938, we see another important person within this research field sent to Siberia, work with the Soviet space program and biogenerators would have ceased with his elimination. Oktarin 1953 to 1980 worked at KB Zarya, NPO Krasnaya Zvezda on the creation of onboard (space, etc.) nuclear power plants [a topic that Dr. Baker also remarks on], took part in the creation of aircraft control systems which we also see in the work of Norseen and Sokolov, which is significant in that the technology 'Thought Injection' as developed by Lockheed-Martin developed directly from the need to interact with pilots in combat aircraft during critical times, so points to a direct correlative result in the research from the Soviets then being imported to the UKUSA after the collapse of the Soviet Union ending up in the work of Lockheed-Martin engineer Dr. John Norseen, again he also studied in Russia with Reflexive Control academics and engineers.

It is not coincidental that there are claims of 'free energy' from this technology along with 'remote sensing', though ostensibly exaggerations of capabilities. Oktarin worked on creating energy for space exploration. In 1973, he is Deputy Chief Designer of NPO Krasnaya Zvezda, Deputy Director of NPO Krasnaya Zvezda for scientific work. He supervised the development and implementation of nuclear power systems for direct energy conversion (thermoelectricity, thermal emission, electrochemistry, radioisotope sources, etc.) in projects: "Romashka", "Topaz", "Yenisei", "Buk", "Lemon", "Orion", "Beta-1", "Beta-2", "Beta-3", "Beta-M", "Beta-S" are currently working in various autonomous objects of technology on the spacecraft "Kosmos-84", "Kosmos- 90 "(1965), radioisotope generators" Orion-1 and Orion-11K "based on polonium-210 were used, on the spacecraft "Lunokhod-1" (1970), "Lunokhod-2" (1973). An interesting twist is that the USA bought some of his power plants. The nuclear power plant BES-5 "Buk" was used on the USA radar reconnaissance satellite. The first apparatus of this series was launched on October 3, 1970 from Baikonur ("Cosmos-367"). The Buk itself has been in development since 1960. at NPO Krasnaya Zvezda. In 1992, the United States purchased two Yenisei (Topaz-2) nuclear power plants in Russia for \$ 13 million. One of the reactors was supposed to be used in 1995 after thorough ground tests. in the "Nuclear Electric Propulsion Spaceflight Test Program".

The generators that he worked on had both negative and positive effects. Counter-measures in military applications is always one of the most important aspects of technical development, either a weapon will be more useful or less useful based on the counter-measures developed in reference to it. In terms of counter-measures Oktarin also developed a system to suppress the same effects that cause physiological problems he has developed devices, sensors and neutralizers of harmful fields of natural and man-made origin, also see

Maslobrod below. In particular, to protect a person from various kinds of negative fields, a series of devices "Gamma-7" «Гамма-7» has been developed: "Neutralizer" «Нейтрализатор» and "Activator" «Активатор».

Persinger also has found there is a way to block 'remote viewing'. Disruption of Remote Viewing by Magnetic Fields, see Ch. 9. In a study with psychic Ingo Swann as the subject Persinger was able to block some remote viewing, suggests that a changing EM field interferes with psychic abilities, static fields enable psi. Could also explain why Psi differs with solar storms, changing EM field in storm. "The results suggest weak, temporally complex magnetic fields generated within [the object]... may have interfered with the stimuli to the [psychic]..." (Persinger, 2002, 994)

In Kernbach's study of the 1986 Soviet experiment he relates that the experiment from 1986 owes its impetus to previous work of Sokolova in 1982. Sokolova's work is related to earlier studies by V.P. Kaznacheyev in the 1970s. These studies are all related to the effect of an irradiated body transmitting its internal state to bystanders, or other objects near by, such as a rat to another rat in its cage. This work actually began much earlier than the Soviet 'inception' of these techniques. Biophotons are a photonic form of radiation that cells and all living matter send out with exchanges of free protons in say a molecule. Others study the bystander effect as relates to Biophotons, earlier we saw how biophotons are used in Brain Computer Interfaces as explained by Dr. Persinger. Some very early studies related to this is that of Gurvitch in the 1920s who reported communications between animals based on photons. Later, the German E. Woenckhaus from 1930 (Mothersill, 2014) experimented on the bystander effect from irradiating mice and then measuring the effect on the test subjects cage mates. Noting Gurvitsch's contribution:

"Intensive research started in the 1920s with the work of Gurvitsch whose 200 or more experiments revealed that when pointing the tip of an onion root (inducer) to another onion root (receiver), separated by quartz glass, the receiver root surprisingly shows an increased rate of mitosis (approx. 20-25%). Since this effect was absent when using ultra-violet (UV)-opaque glass, he concluded that electromagnetic radiation in the UV range was responsible. He termed this type of radiation "mitogenetic radiation". In 1927 Frank & Gurwitsch reported the successful spectroscopic detection of UV radiation in the range of 193-237nm originating from frog muscles. Gurwitsch's research stimulated many other researchers in the 1930s and early 1940s to replicate and extend their experiments, leading to both successful and unsuccessful replications. The research showed that there is indication for a non-chemical, electromagnetic cell-to-cell signaling which can be experimentally detected when investigating the effect of inducer cells on receiver cells, where the inducer cells have to be in the mitotic state or in a stressed condition (induced by e.g. chemical, thermal, mechanical or electrical treatments). The radiation emanated from stressed cells was termed by Gurwitsch as "degradation radiation" [negative position of Akimov generator]. One limitation of Gurwitsch's work is that it does not completely meet modern scientific requirements for proper experimental investigations, i.e. it lacks proper statistical analysis and complete control over confounders. However, new analyses of Gurwitsch's data revealed that most of the results were statistically significant using modern statistical test (personal communication, Prof. Belousov [Faculty of Biology, Lomonosov Moscow State University, Moscow], Dr. Stefanov [Institute of Biophysics, Russian Acad Sci., Moscow]). Unfortunately, these analyses were not published. Thus, Gurwitsch's work is primarily of historical significance and should be regarded as an initial approach for experimental investigation of a new topic. Unfortunately, in the 1940s-1950s, World War II and a shift in the focus to biochemistry halted research into this topic. (Scholkmann, 2013)

In the Soviet Union we can see pioneering work in remote influencing on biological objects was first proposed in the 1920s and continued post-war with experiments noted from the 1960s on. The main researcher in this area was V.P. Kaznacheev regarding his contributions

In the 1960s-1980s the research group of Kaznacheev continued to investigate the topic by performing a large number of experiments with different cell cultures. They used a specially designed device to perform the experiments consisting of two flasks, which were connected by a window of either quartz glass or a UV-opaque glass plate (with a depth of about 0.2-2 mm). An "inducer" cell culture was placed in one flask and a "receiver" culture in the other. It was investigated how the treatment of the inducer culture with different stressors (e.g. viruses, chemicals or UV-radiation) affects the receiver culture. For example, experiments using inducer cell cultures consisting of monkey kidney tissue treated with adenoviruses demonstrated that the receiver cell culture also shows morphological signs of infection in 72% of performed trials (total number of trials: 170) after 2.3 days of contact. The observed effect was termed the "mirror cytopathic effect". After analyzing all experiments done, Kaznacheev concluded among other things that the effect (i) was at its strongest when cultures from the same species were used, (ii) seems to be caused by an electromagnetic interaction between the cultures in the UV range, and interestingly... (iii) its strength showed an annual modulation (month with most successful experiments: August), possibly related to environmental factors. (Scholkmann, 2013)

The Soviet Union recognized Kaznacheev for his contribution, 'The Phenomenon of Intercellular Distant EM Interaction in the system of Two Tissue Cultures' dating it officially to Feb. 15, 1966. We can see clearly there is a continuation of the work of Gurvitsch. Kaznacheev was of interest to the DoD and the CIA. Former military intelligence analyst in the field of psychotronics, Lt. Col. Tom Bearden has written of Kaznacheev's contributions to Psi research:

As an example of the kindling effect and the variability of photon quenching of the paranormal channel, some extremely interesting experiments were performed by V.P. Kaznacheev et al regarding the paranormal transmission of death. Briefly, two groups of cells were selected from the same cell culture and one sample placed on each side of a window joining two environmentally shielded rooms. The cell cultures were in quartz containers. One cell culture was used as the initiation sample and was subjected to a deadly mechanism - virus, germ, chemical poison, irradiation, ultraviolet rays, etc. The second cell culture was observed, to ascertain any transmitted effects from the culture sample being killed. When the window was made of ordinary glass, the second sample remained alive and healthy. When the window was made of quartz, the second sample sickened and died with the same symptoms as the primary sample. The experiments were done in darkness, and over 5,000 were reported by Kaznacheev and his colleagues. The onset of induced complementary sickness and death in the second culture followed a reasonable time - say two to four hours - behind sickness and death in the primary culture.

The major transmission difference between window glass and quartz is that quartz transmits both ultraviolet and infrared well, while glass is relatively opaque to ultraviolet and infrared. Both quartz and glass transmit visible light. Thus glass is a suppressor of the paranormal channel, while quartz is not.

By performing the experiment in darkness through a quartz window, the four-law patterns of disease, sickness, or death engendered in the primary sample are not extensively squelched by the photon interaction, and these four-law patterns are transmitted through the quartz

window into the second cell culture. Since the genetic patterns of the second culture are the same as those of the first, sympathetic four-state interaction and eventual kindling occur, resulting in the appearance of the effects in the second culture.

It is well known that cells also emit mitogenic radiation, including radiation in the ultraviolet and infrared regions. Since these same regions are not strongly suppressed by the photon interaction, one may hypothesize that paranormal effects may be strongly modulated onto infrared and ultraviolet photon activity, and there is indeed evidence for such an assumption. In 1950, Western researchers found that cells could be killed in darkness with ultraviolet radiation, kept shielded from visible light for twenty-four hours or longer, and then if radiated with visible light the cells would start reviving by hundreds of thousands even though they had been clinically dead.

Specifically, every cell emits mitogenetic radiation in the ultraviolet twice: when it is born and when it dies. The UV photon emitted at death contains the exact virtual state pattern of the condition of the cell at death. The healthy cells are bombarded with death messages from those that are dying, and this diffuses the death pattern throughout the healthy culture, eventually kindling into the same death pattern there.

However, the squelching of the paranormal channel by photon interaction is never complete, or paranormal phenomena could never occur in daylight. Hence paranormal patterns can be modulated even onto visible light, although only extremely weakly. Thus we may speak of the  $Q$  or sharpness of the paranormal modulation upon photon frequencies;  $Q$  is extremely low for visible light and may be extremely high for infrared and ultraviolet. In the visible light spectrum, it is probable that extremely large numbers of near-zero strength paranormal patterns are modulated on the light radiation; hence these patterns simply consist of a very weak background noise and the kindling effect does not apply. (The patterns are so random as to be self-canceling in the kindling effect.) (Bearden, 1983)

V.P. Kaznacheev later in 1991 founded a scientific committee 'Bioenergy', showing the continuation of his work outside of official government labs after the fall of the Soviet Union (Kernbach, 2013).

Which brings us to the continuation of Soviet research in this area under V.A. Sokolova. In 2016 Sokolova published a synopsis of work on remote influencing on biological objects in a book form. Sokolova gives information on how these experiments developed over the years:

A.A. Deev, who created a generator emitting fields of an incomprehensible nature. Research conducted at the Institute of Clinical and Experimental medicine SB AMS USSR (director V.P. Kaznacheev) in 1981 Deev jointly with the staff of the laboratory of Biophysics A.P. Mikhailova and N.B. Kartasheva showed that under the influence of this generator, biophysical cell culture characteristics. During the experiment, a double shielding cells from the effects of an electromagnetic field. In 1984 in Peoples' Friendship University named after P. Lumumba V.A. Sokolova, A.A. Deev and Sukhanov conducted experiments that recorded a sharp change relative dispersion of electrical conductivity in plants at frequencies  $1 \div 517$  kHz when exposed to this generator (measurements were carried out by method V.V. Gorchakov and A.D. Kotamokhin). The generator was based on spin polarized (SP) materials. It must be assumed that from this deep interest in work with JV generators and began for Akimov his research to create torsion generators. (Boldyreva, 2009)

In this work some of the details on how the generators work is given, similar to the Zeeman Effect, it has 3 channels, a positive transition, negative transition (causing deleterious effects) and neutral or zero-transition channel. The zero channel is the channel that carries information with very low force and energy, the 'psi' channel (Sokolov, 2016, 30). Sokolov also credits not just the A-B effect but also the gyromagnetic 'spin-wave', the generators are able to control the physical vacuum. In explaining the physics behind the generator Sokolov turned to the anti-gravity theory of Jose Del Prado explaining that between 2 counter 'torsion' [spin] fields there is a spatial boundary tension fields=0, a cord, conductor in layers of cord [cord may resemble Persinger's Singularity explanation], between there is a gap formed by repulsion of same charge (Sokolov, 2016, 35). In an interesting parallel with other researchers in 'thought injection' such as Dr. Norseen, Sokolova also worked on avionic systems involving the interface of the pilot and machine (Sokolova, 1981). Sokolova expresses both alarm and dismay at the use of the technology for purposes of control in terms of mass control he writes:

Even the Russian scientist Shipunov argued that the transfer of information is possible at the level of human thought. This is real since wave functions are organized more strictly. It was on Earth with the number of electromagnetic matrices grows every year negative sign, and surrounded by one person they can exist, and the other person is simply blinded by them. Therefore, it is not surprising that 70% of unsolved crimes their cause is unknown. Under certain conditions that, in particular, it can be called a "soulless person", formed vacuum, and electromagnetic matrices with a negative sign, who then begin to control the Person like demons. This is a very dangerous situation, and one can only hope for the fact that torsion fields are not the final station of the wave world. We hope that in addition to torsion fields, there are more completed fields, purely informational, to save the world. (Sokolova, 2016)

It should be noted, in a manner related to TI claims of neural monitoring, that Sokolova finds that the Torsion (Spin) Field is broadcastable over media (Sokolov, 2016, 16), Kernbach has also performed experiments related to finding if weak radiation can be transmitted through the internet, which he concluded positively it could (Kernbach, 2015), again many TI claim to be affected through television and internet connected devices with what they call Directed Energy Weapon attacks. Later, Sokolova expressed dismay at the attacks on Russian Torsion scientists by Russian Scientific authorities and points out that some have even left Russia to work for the west:

"...Y. Vorobyevsky It would be better if he criticized forged those "performers" of torsion fields who left Russia in its most difficult time and settled, for example, in England. Therefore, it is possible that they are not working with us, but in the West in this scientific direction. (Sokolov 2016)

Sokolov (see 2016, 56-9) has brought forth several meaningful conclusions to his research, a summary is provided:

- Field Twins, In the frequency range from 1 to 512 *kHz* with remote exposure revealed an insubstantial (non-physical) field twin in each of the examined material object. Each material object after the torsion left impact, you can issue a field passport in the range frequencies from 1 to 512 *kHz*



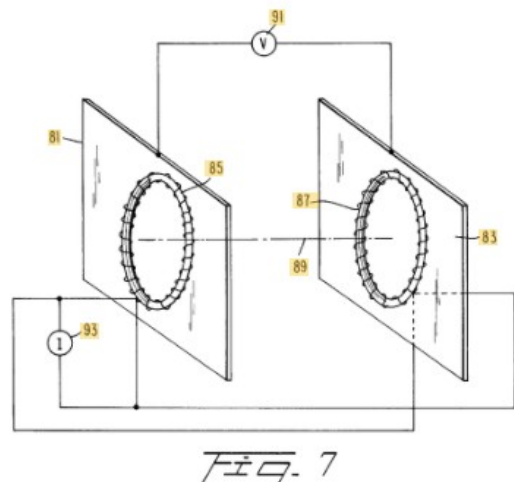
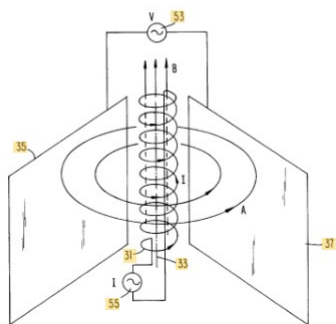
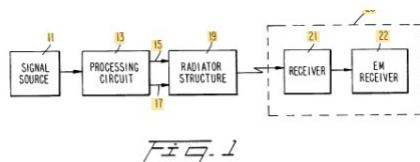
- Individual Map, The field non-material counterpart of each material the object has within the same architectural form both general and unique to him individual characteristics in the distribution within the field package of curves.
- 
- Gravity and Communications, The process of remote action of torsion fields of communication is concerned with the geotropism of plants, that is, with gravity.
  - Operational Modes, The torsion generator can operate in three modes: positive, negative and zero transition. [Spin Field is Trinary, neg, pos, neutral or qutrit like at the metaphysical scale it is enneagram like]
  - Death Ray, Negative impact (mode) of the torsion field turns a previously organized field package into a completely disordered distribution of curves and leads to destruction; the curves are preserved.
  - Imprinting, There is a transfer of information properties from one object to another, and the latter acquires the characteristics of the first only if the torsion generator operates in the zero-transition mode. Transfer is possible in the operating mode of the torsion generator to zero-transition from an inanimate object (washer) to a living object (plant), and the latter loses part of its substance "
  - Fatty Acids, Found signs of changes in the geometric iso-metrics under the action of a torsion field on those objects that belong to unsaturated hydrocarbons, that is, they have a double bond - including if this bond is present in the radical organic compound. [found that milk irradiated coagulated, increasing it's viscosity, applicalbe to other mammalian fat cells?]
  - Broadcasting, Torsion fields are recorded on a tape and success fully broadcast to the object, pictures also have same effect, photons 'weak emmissions' (A, psi) are captured by Electro-magnetic based storage.
  - Viscosity, related to Fatty Acids. In some cases, torsion fields can change the consistency of liquid substances, turning them into a solid state. Torsion fields are capable of changing the viscosity of fuels (kerosine, gasoline, oil), and - the greater the degree of continuous efficiency, the stronger this change, improves fuel efficiency. Carried out the transfer of the viscosity properties of fuels with fuels for fuels that are at room temperature temperature, and the intensity of this process depends on the degree unsaturation of the investigated fuel, and to a lesser extent changes in the viscosity of the fuel in which more chemically pure substances.
  - Stress Effects, Under stressful conditions of an object in conditions of increased stress the concentration of saline nutrient solution changes field state contour.

Sokolov concluded: "Thus, my personal experimental results of exposure to torsion fields or those in which I took an active part. Besides those stated, there are also many other experimental materials of other specialists; and by now accumulated great experimental materials, convincingly that

the effect of torsion fields on material objects really takes place. And although now there is a situation where the experimental part of the problem is ahead of the theoretical, nevertheless, in science experimental confirmation has always been the end proof of truth.” (Sokolov, 2016, 56-59)

Kernbach has concluded that the so-called ‘torsion’ field and generators are actually EM based antennas that use the Ahronov-Bohm effect. Both the effect and the history of the ‘Torsion’ generators are of importance to understand the development of this technology and how it eventually ends up in the CIA contractor SRI with Hal Puthoff’s patent for a generator based on the Ahronov-Bohm effect came to be in 1993. An examination of Hal Puthoff’s 1993 patent give us an ideal as to how the Akimov and other generators, all based on a basic Russian prototype, work and function and the physics behind them. First, it is important to understand Hal Puthoff’s background. Puthoff is a physicist that formerly worked for the Stanford Research Institute, examining the physics behind psychics associated with SRI’s Remote Viewing studies funded by the DoD and CIA. He has collaborated with Lockheed-Martin scientists on Zero-Point Fields (ZPF) as referenced by Lockheed-Martin engineer John Norseen. Collaborating with Bernhard Haisch of Lockheed-Martin on ‘*Advances in the Proposed Electromagnetic Zero-Point Field Theory of Inertia*’, Haisch had previously to this paper worked on ‘*Quantum and classical statistics of the electromagnetic zero-point field*’ (Haisch, 1996). As a contractor for the CIA back in the day, the early 70s to the 90s, he worked on the physics of the phenomenons being experimented on by him and colleague Targ. Eventually in 1993, shortly after the public publication of the Soviet “Akimov” generators he patented an American version while working for SRI. One of the primary effects behind his device according to his patent filings is the Ahronov-Bohm effect. Puthoff writes:

With the advent of quantum theory, however, the above picture changed. In the prior art literature the  $(A, \Phi)$  formalism has emerged as more fundamental because it predicts certain quantum interference effects that have been observed and are not apparent from the  $(E, B)$  approach. This difference was first Set forth in an unequivocal way in a Seminal 1959 paper by Aharonov and Bohm, entitled “Significance of Electromagnetic Potentials in the Quantum Theory,” Physical Review 115, 485 (1959); see also “Further Considerations on Electromagnetic Potentials in the Quantum Theory.” Physical Review 123, 1511 (1961). In these papers it is shown that in certain two-leg electron-interferometer configurations in which the potentials  $A$  and  $\Phi$  are established in a region of Space, but  $E$  and  $B$  are absent, it is nonetheless possible for the potentials to induce changes in electron quantum interference patterns. That is, electrons that are in an electromagnetic field-free region and therefore do not encounter an electric or magnetic field are none the less acted upon by the presence of the  $A$  and/or  $\Phi$  potentials. Such an effect is now referred to broadly as the Aharonov Bohm effect, and devices have been built which demonstrate this effect in the laboratory; for a recent overview, see Y. Imry and R. A. Webb, “Quantum Interference and the Aharonov-Bohm Effect,” Scientific American 260, 56 (April 1989). A Second quantum interference effect which demonstrates the independent reality of the  $A, \Phi$  potentials in the absence of the  $(E, B)$  fields (and one which is significant for the technology disclosed herein) is a single-leg electron interferometer effect known as the Josephson effect, See R. P. Feynman et al., The Feynman Lectures on Physics, vol. III (Addison-Wesley, Reading, Mass., 1965), pp. 21-14 through 21-18. The Josephson effect is based on the fact that the current density  $J$  through a Josephson junction (which consists of two Superconductors Separated by a thin electric insulator) is determined by the magnitude of the potentials  $A$  and  $\Phi$ , independent of whether  $E$  or  $B$  fields are present (Puthoff, 1993)



## Puthoff Design 1

As stated earlier by Sokolova these A-B (Ahronov-Bohm) Generators, as I will refer to them, can control vacuum fluctuations. Referencing Puthoff design 1 functioning of these devices is based around a helical coil that is stood up vertically (31) which is powered by a DC power source. This solenoid gets current to generate a vertically directed magnetic field (B), which also generates a curl-free vector potential exterior to solenoid. The plates (37,35) driven by voltage source produces horizontal electrostatic field, the voltage varies as the time derivative (rhythmic). The electrostatic and electrodynamic fields from the solenoid and Plates cancel in the horizontal plane suppressing the EM Field in the horizontal plane. The field from solenoid and plates combine in horizontal plane causing a signal along the horizontal plane. The Receiver is a quantum interference receiver, such as the Norseen referred to the human brain, the receiver includes a Josephson junction super conductor rods [also see Baker HFGW design].

Referencing Puthoff Design 2 or Fig. 7 above we are presented a different setup, one that is used by Dr. Michael Persinger in some of his experiments, where toroidal coils, if both are properly phased and adjusted in amplitude to provide a time varying signal (A,  $\Phi$ ) having no EM component, for more technically inclined it absent from the Maxwell Equations a force, there is no Lorenz Lemma.

The gist of how this works is that electric potentials, not actual force, that is structure minus any weight behind it, imagine a hologram of a punch hitting you. So they end up transmitting structure but not force which interacts subtly with matter which leads to reactions and causations which we would not 'normatively' anticipate to be caused by such low strength fields.

Having noted that Intelligence is directly involved in the ideals of remote action or sensing it is worthwhile to look at what Dr. Persinger was able to learn through similar studies as that of Kernbach.

Dr. Persinger has written about the Casimir Effect in several publications. In a paper on thixotropy which has to do with the viscosity of water and it's impact by EM fields. He studies the pH free protons of aqueous solutions separated by non-trivial non-local distances but united in EM fields applied to the

water samples which he found a deep correlation between one water samples pH changed locally and then reflected in the remote water sample. Regarding virtual particles Persinger writes:

Here I present quantitative evidence that thixotropic properties of water could reflect a universal interface for the transformation of virtual particles from zero-point, vacuum oscillations to real particles. (Persinger, 2015, 6203)

Previously we have read how Ahronov-Bohm generators affect the viscosity of water, which is it's thixotropic properties, knowing that these generators affect the vacuum then it is important to understand the effect of these generators on water, of which all life depends, as well as playing an important role in controlling the EM within Microtubules which is to say our memories and working consciousness, and subconscious.

Dr. Persinger points out on several occasion the connection of  $10^{-20}$  J it's role not just in neuronal EEG rhythms, or it's role in free proton creation. He connects them to vacuum oscillations in water:

The persistent, subtle, and specific properties of thixotropic phenomena in water meet the quantitative criteria for a special condition that could be distributed throughout the sub-matter spatial fabric of the universe. The prevalence of the quantity of energy in the order of  $2 \times 10^{-20}$  J derived from the product of the ratio of the proton's magnetic moment to its unit charge and viscosity applied across the O-H length could mediate the dynamics that connect water to the transformation of vacuum oscillations (or virtual particles) to real states and determine the spatial and temporal boundaries of the coherent domains that create the thixotropic state.

The state could originate from the interaction between the spin-orbit magnetic moments and neutral hydrogen line frequency that sets the condition for a single orbit to display  $\frac{1}{2}$  wave (virtual) and  $\frac{1}{2}$  real (particle) properties. The mass equivalent of the transformation from virtual to real states from energy converging between Casimir-magnetic field strengths at the limen of the intergalactic background magnetic field compliments the numbers of free protons (pH) in an optimal volume of water and determines the numbers of interactive molecules within the domains. When undisturbed or within minimal radiant influence the conduit of  $\sim 2 \times 10^{-20}$  J would conservatively increase the viscosity to five times the usual value.

The involvements of the energies that reflect shifts of photons from rest mass as well as a "diffusivity" or "entanglement" velocity that converge with  $10^{-20}$  J as a universal value emerge across levels of spatial structure and suggest that thixotropic conditions of water could reflect universal conditions. The occurrence of excess correlations between solar and terrestrial water molecules could accommodate the periodicities noted in thixotropic responses reported in various chemical systems over the previous decades. 6209

In a related experiment Dr. Persinger studied the long-distance interaction of water samples and their connection by two alternating pattern magnetic fields, that is he created two separate EM fields put

water samples in these fields and added free Protons ( $H^+$ ) and watched not just the local sample that had free protons directly added but also the separate non-local field had its samples pH increase although no direct free protons were added to it locally. He also noted that this effect was in small volumes <25cc, which is much larger than water in the Microtubules. The issue of thixotropy obviously plays a role in life:

The thixotropic phenomenon of water may determine many of the parameters that both create and constrain the conditions for living systems. Thixotropy is an emergent property of liquids and gels whose viscosity slowly increases and appears to involve the intrinsic ordering of large numbers of water molecules. Vybiral and Voracek's study of water containing ions indicated that the gel-like behavior developed "spontaneously" over time when undisturbed in closed vessels. Mechanical stimuli dissipated the enhanced viscosity and the correlative properties. The history and primary explanations for the thixotropic phenomenon of water have been reviewed recently by Verdel and Bukovec. They concluded that thixotropy is one "of the more complex characteristics associated with the behavior of non-Newtonian liquids". One would expect the mechanisms to be relatable to quantum levels of discourse. Here I present quantitative evidence that thixotropic properties of water could reflect a universal interface for the transformation of virtual particles from zero-point, vacuum oscillations to real particles.

Noting that water's viscosity, thixotropy, loses entropy (non-structure) as viscosity increasing, becoming more 'solid', the harder the more structure the less entropy. Persinger found that in undisturbed, including from thermal radiation like sunlight, that thixotropy increases in spring water samples, but not distilled water like from public taps, suggesting that the mechanism for this increase are trapped EM fields in the water:

The hypothesis by Verdel et al. that thixotropy and proton transfer within water, that is the dynamics of the hydronium ion involving Grotthuss-like mechanisms, are intricately related is revealing. They examined the possibility that a structured network of hydrogen bonds between water molecules and ions in aqueous solutions when left undisturbed for protracted periods near hydrophilic surfaces facilitated this condition. If this were valid, then weak magnetic fields of the appropriate temporal configuration could be contained or "trapped" within these structure networks as predicted by Del Giudice and Preparata. When we exposed spring water containing physiological concentrations of ions to 3 m (Persinger, 2015, 6201)

What could cause this, Persinger suggest the Casimir effect:

The Casimir effect has been considered a "pure quantum effect" from zero-point oscillations. According to Bordag et al. it represents the zero-point energy of a quantized field. To transcend and integrate spatial levels from the smallest space (Planck's Length) the Casimir process should be transformable to macroscopic phenomena, such as matter-level magnetic

fields. If this occurs then there should be a convergence of quantitative solutions that relate to the properties of matter within specific boundaries. (Persinger, 2015, 6203)

The occurrence of the  $\frac{1}{2}$  value has significant implications for the transformation of virtual particles to real particles. If the boundary conditions, that is the single orbital completion, depends upon time and is associated with external magnetic fields, than creation of particles could occur. From a strictly geometric perspective, because the movement is within a circle, the packet of energy is perpetually “accelerating”. If for a given single orbit of an electron around a proton half of the time the electron occurs as a particle (matter) while the other half of the orbit it operates as an emergent virtual particle (wave) derived from the Casimir-magnetic energy transformation, manifestations of random vacuum fluctuations could occur. (Persinger, 2015, 6204)

If the single orbit is related by  $\frac{1}{2}$  to the transformation from virtual manifestations to “real” particles or matter and the changing boundaries of magnetic fields are present there should be creation of particles from the zero point vacuum oscillations. The transformation vector would be the strength of the magnetic field coupled to the geometry of sub-matter space. (Persinger, 2015, 6204)

So remembering according to Bandyapadhyay that Brain microtubules are controlled by water inside the MTs it is now possible to see through Persinger’s work how Norseen’s Thought Injection focused on the MT could work. Another important relation that Persinger brings up is that of the question of entanglement in water, writing on the concept of ‘entanglement velocity’ that there is an actual speed of the so-called ‘instantaneous’ entanglement.

However for excess correlations to occur “simultaneously” from our temporal perspective within the universal boundaries there must be an additional velocity whose value ultimately connects the upper boundaries for photon masses to the energies ( $\sim 10^{-20}$  J) congruent with the operations within water that would contribute to increased viscosity. Persinger and Koren equated the product of the four dimensional geometries for circularity, that is,  $21.3 \pi^4 r^7 f$  with the aggregate  $m^7 \cdot s^{-1}$ , to the optimal combination of universal values that balanced this relationship. They were  $G^2 \cdot m^2 \cdot d \cdot t^3$ , where G was the Newtonian Gravitational constant, m was the mass of the universe, d was its diameter and t was its age. The resulting value for this “diffusivity” term for the 7th root was  $2.84 \times 10^{23} \text{ m} \cdot \text{s}^{-1}$ . They called this value the “entanglement” velocity. Approximately 7 to 8 min would be required for the universe to be traversed.

A process with this velocity moving between the earth and the sun would require  $\sim 10^{-12}$  s or the life-time of a hydronium ion before the proton moves to the next water molecule. that

“diffusion velocity” derived from the appropriate combination of  $G$ , and various powers of the width of the universe, its mass, and its age is related to the velocity produced by the ratio of the voltage field to the magnetic field by a frequency that at the quantum level is equivalent to the upper rest mass of the photon. (Persinger, 2015, 6208)

Similar quantities of energies within the water molecule and across levels of discourse from the photon to intergalactic magnetic fields when coupled partially by the entanglement velocity indicate the prominence of the value of  $10^{-20}$  J as the energy metric for both dynamics and structure within the space that is occupied by all matter including water. It might be considered the conduit by which energy and virtual particles transform from and to entropy. (Persinger, 2015, 6208-9)

Looking into the method of entanglement between the two water samples, which were correlated or coupled by a magnetic field generator which we now know capitalizes on the Ahronov-Bohm effect to create entanglement, Persinger notes some particular attributes about these fields:

However the excess correlations were only manifested when the reactions within the two volumes of water occurred in the centers of rotating, phase-modulated magnetic fields that shared the same changing angular velocities. When a coupled decreasing phase/frequency-modulated pattern and accelerating group velocity pattern was followed by a coupled increasing phase/frequency modulated pattern immersed in decreasing group velocity the powerful excess correlation occurred. The duration of the excess correlation was about 7 to 8 min. Reverse order presentations or fixed angular velocities did not produce the effect. (Persinger, 2015, 6207)

Again noting the 8 minute relationship to entanglement and experimentation he found that the fields generated entanglement for 8 minutes:

When a coupled decreasing phase/frequency-modulated pattern and accelerating group velocity pattern was followed by a coupled increasing phase/frequency modulated pattern immersed in decreasing group velocity the powerful excess correlation occurred. The duration of the excess correlation was about 7 to 8 min. Reverse order presentations or fixed angular velocities did not produce the effect (Persinger, 2015, 6207)

For excess correlations between complimentary shifts in pH within two volumes of water separated by non-local distances the optimal frequency of the angular rotation was balanced with that obtained from the product of the magnetic moment of the proton and the intensity of the magnetic field divided by Planck's constant. When this occurred the magnitude of the shift attributed to excess correlation increased by almost a factor of 10. (Persinger, 2015b, 406)

Persinger suggests that the orthogonal aspects of the field are what creates correlations citing again the role of the Schumann Resonance:

Although there are clearly other explanations the orthogonal directions of the attenuated static field and the dynamic toroid field could create the conditions for the type of photon involvement (Vaziri et al., 2002) derived from the Lorentz Lemma that would allow superimposition with the Schumann Resonances that occupy the space between the earth's surface and the ionosphere and most if not all human brains (Persinger and Saroka, 2015; Saroka and Persinger, 2014).

Though this study is on thixotropy and the Casimir Effect it is not just limited to changing pH in water samples, the implications of this research go further as explained by Persinger:

"A means by which information could be inexpensively exchanged over large distances without the requirement for classic "transmission" and the escalating expense of equipment would substantially alter the concept and form of communication. The concept of "non-locality" and "excess correlation" has been considered by many as the quintessential property limited to quantum phenomena. As indicated by Hofmann et al., "observers of two or more entangled particles will find correlations in their measurements that cannot be explained by classical statistics". Two-photon, three dimensional entanglements may be capable of applied quantum communication. Such quantum energy "teleportation" may not be limited by distance. " pg. 45 (Persinger, 2014)

## **Molecular Resonance and Soviet Research**

A researcher cited by both Dr. Persinger and Dr. Bandyapadhyay is the work of Dr. Irene Cosic, formerly of the U. of Belgrade, of which also Norseen connected researcher Koruga is a professor. She now teaches at a university in Australia. Cosic's main contribution is known as the 'Resonant Recognition Model'. Which importantly, allows for a new formulation of how cell signaling works, which is usually based on the JAK-STAT cellular signaling pathway, rather than resonant frequencies as suggested by Cosic and earlier Soviet Research, it should be remembered Belgrade was behind the Iron Curtain in the former Yugoslavia. The history of Resonance in physics is not new, people have been studying resonances in EM for instance for decades. Resonance has played a part in theoretical physics since the inception of Quantum Mechanics. One of the lead authors in QM Theory, Nazi physicist Pascual Jordan, in the early days while working with Biologists at the Berlin Brain Institute came up with a resonant theory of molecular attraction. Which was 'proven' wrong in the end by the majority of scientists while being explored and developed further by scientists inside Nazi Germany at the Brain Institute, which led to an official science that is accepted regarding cell signaling based on the JAK-STAT pathways and another alternative pathway, which is ignored and not studied very much in the West, of resonant cell signaling, indeed most in the west do not consider this valid, yet we see how fruitful gains in the field of Psychotronics were conducted through this alternative scientific explanation for cell signaling. Jordan's ideals and that of the Berlin-Buch group later influenced the ideals of Frohlich who is recognized as a well founded scientists on molecular issues. One author writes regarding Frohlich and Jordan:

I went to see Frohlich because I had been trained as a theoretical physicist and we hoped to find out whether there was anything in his theory, which, I should say, flew in the face of everything that molecular biologists believed about interactions between large biological molecules. Frohlich believed in long-range 'resonance' forces between identical molecules. Every other molecular biologist preferred short-range forces between areas which are



topographically complementary on opposing surfaces of molecules. This is typified by the two complementary chains of DNA within the double helix.

Looking for some sort of perspective on Frohlich's theory, I discovered that the theoretical physicist, Pascual Jordan, had formulated essentially the same idea more than 30 years earlier. He had suggested that it might underlie molecular replication. The idea was sharply rebutted in 1940 by Linus Pauling in a short paper to the journal Science. Pauling's paper seemed to foreshadow the idea of complementarity as the way to replication and provide the physico-chemical basis for genetics, later so brilliantly realized in Crick and Watson's double helix. (Galloway, 1989)

In the paper mentioned it is rather curious that Linus Pauling had such a sharp response to it, it is noted by others whereas most ignored Jordan's paper when it first came out, Pauling's attachment and drive towards it was of note. Which did lead to the non-resonant theory achieving dominance in the scientific community, of which Pauling was a part. It is worthwhile to look at the specifics of the argument that Jordan brought forward, which was later shown to have scientific validity in other areas through experimental research in the Soviet Union while Western science remained controlled and stymied by academic discipline, a discipline that is easy to manipulate with monetary power as most universities are dependent on private funding of very influential industrial powers:

Jordan suggested that quantum-mechanical resonance phenomena would lead to an attraction between molecules containing identical groups, and thus to self-reproduction of the antibody molecule.... Jordan's concept was substantially identical to Ehrlich's, with the substitution of a more 'modern' mechanism for the reproduction of the specific antibody molecules. It was even more closely the equivalent of Jerne's natural selection theory...but failed completely to attract the attention of biologists. It did, however, come to the attention of Linus Pauling, then promoting his own theory of antibody formation, who lost no time in attacking Jordan's formulation. The nature and role of intermolecular forces was Pauling's special domain, and he was quick to point out, in Jordan's own quantum-mechanical notation, that resonance attractions were less likely between identical molecules than between complementary molecules, as Pauling's own theory had suggested. It is of some interest that although Pauling's attack was limited to Jordan's proposed mechanism for the reduplication of antibody molecules, it served also to eclipse the natural selection aspect of the argument. (Silverstien, 2009)

Jordan believed that like molecules would have like resonances and that molecules would be attracted to these resonances. Although, the particulars are not true, the ideal did bear fruit later in the a similar concept of Cosic's that Molecules that share function share resonances, rather than being an issue of stacking or macromolecule building, it was relevant in terms of function. Cosic being an eastern bloc educated scientific engineer later in the 1980s came up with the Cosic Resonant Recognition Model. It is related though I have no direct or previous specific ideal related to Cosic's it is generally related in the Resonance research of the Soviets. The question then is, did Jordan's ideals percolate into Soviet thought? As seen in other sections after the war the Soviets captured Nazi scientists and brought them to work on the Soviet Nuclear program, some of whom were collaborators of Jordan in Berlin-Buch.

For instance G. Zimmer, a specialist in nuclear radiation and genetics, was taken to the Soviet Union, a close collaborator with Jordan. Eventually, the resonance model would prove fruitful in the field of Psychotronics. Kravkov in writing about the use of Millimeter Waves (GHz) in Soviet Psychotronic research relates how resonances were studied in relation to signals used to influence biological objects:

Resonances were the first, most intriguing manifestation of microwave exposure. Radiophysicists were struck by the narrowness of the operating radiation bands, the **Q factor** (the ratio of the wavelength to the bandwidth) reached 300-500 units. To date, influences (capillary effect) with a figure of merit up to 10 thousand units have been found. (i.e. at a wavelength  $\lambda = 10$  mm, for example, the permissible deviations are in the range from 9.9995 to 10.0005 mm, no more).

Soon it was realized, that not a millimeter wave in general and specific, ostromezonansnye their frequency, causing one or another back a response of living organisms, and thus have a signal value to their control systems, can be a tool of remote external influence on biological objects, including per person. A long-term experimental search for bioeffective frequencies has begun.

"The response to them can be different, both positive and negative. There are certain "frequency-amplitude windows", inside of which there is a detectable reaction of the biological object, and outside of them, there is no. In this case, the most informative is the frequency of exposure, and the amplitude determines only the mechanism of realization of the response of the organism. "

Resonances have been studied for forty years, but there is no comprehensive, satisfying explanation for the mechanism of their occurrence. There are only assumptions. More or less reliable.

"Formally, the resonance effect can be observed if the natural frequency of any structure has a natural frequency of oscillatory or rotational motion, which coincides with the frequency of the incident radiation ...

A strong frequency dependence should also be observed in cases where the frequency of the incident MM radiation coincides with the natural resonance frequency of a molecular ensemble of the cluster type ...

The resonance effect can also take place in cases when the frequency of absorption of an electromagnetic wave of any molecule coincides with the frequency of the incident radiation ".

(Kravkov, 2006)

"It was noted above that the frequency is the carrier of information, and the modes of vibration in the body can transform into each other. Therefore, it can be assumed that the resonant response of an organism is possible at the same frequencies with completely different types of influences on it (electromagnetic, acoustic, gravitational, etc.).

Further, the question arises about the preference of this or that effect and its effectiveness, but the reaction of the organism, of course, must exist. "

The greatest interest has always been in the resonances of the human body as a whole: "The argument for using electromagnetic radiation with  $\lambda = 4.9$  mm was considerations based on the known fact of maximum absorption of millimeter waves in the atmosphere by molecular oxygen;  $\lambda = 7.1$  mm was determined in the experiment - when treating animals affected by oncopathy; and only  $\lambda = 5.6$  mm was chosen based on the analysis of clinical observations of the results of treatment of patients with gastric and duodenal ulcers ". These frequencies are considered basic and were allowed for use by the USSR Ministry of Health.

There are also references to the therapeutic use of wavelengths of 3.8 mm and 6.4 mm. Most recently, the number of therapeutic ones has also been supplemented with wavelengths  $\lambda = 5.96$  mm, 5.79 mm, 4.61 mm.

The human types most sensitive to one or another wavelength have been determined.

The wave  $\lambda = 7.1$  mm is more suitable for "sprinters" who are characterized by relatively low resistance to long-term external and internal factors (stimuli), the ability to carry out large volumes of activity in short periods of time, i.e. fast entropy syndrome.

The 5.6 mm wave is more useful for "stayers" who have "high resistance to long-term internal and external factors ..., slow development of the disease, ie. delayed entropy syndrome.

(Kravkov, 2006)

Irene Cosic' herself has described her interest in Resonances as stemming from the work of Nikola Tesla, who studied the brain frequencies from 3-69Hz (Cosic, 2017). From this she eventually was led to formulate the Cosic Resonant Recognition Model, which was used by Badhyapadhyay to study the EM resonance of Microtubules which is also used by Norseen for 'Thought Injection'. Cosic has defined the RRM in the following:

The RRM enables the calculation of these spectral characteristics, by assigning each amino acid a physical parameter representing the energy of delocalized electrons of each amino acid. Comparing Fourier spectra for this energy distributions by using cross-spectral function, it has been found that proteins sharing the same biological function/interaction share the same periodicity (frequency) within energy distribution along the macromolecule [5,6]. Furthermore, it has been shown that interacting proteins and their targets share the same characteristic frequency, but have opposite phase at characteristic frequency [5,6,14]. Thus, it has been proposed that the RRM frequencies characterize, not only a general function, but also a recognition and interaction between the particular macromolecule and its target, which then can be considered to be resonant recognition. This could be achieved with resonant energy transfer between the interacting macromolecules through oscillations of a physical field, which is electromagnetic in nature. (Cosic, 2017)

As mentioned this has been used in modeling MTs. Persinger's group has also had beneficial results through referencing the RRM.

Cosic discovered that spectral analyses of a protein sequence after each constituent amino acid had been transformed into an appropriate pseudopotential predicted a resonant energy between interacting molecules. Several experimental studies have verified the predicted peak

wavelength of photons within the visible or near-visible light band for specific molecules. Here, this concept has been applied to a classic signaling pathway, JAK–STAT, traditionally composed of nine sequential protein interactions. The weighted linear average of the spectral power density (SPD) profiles of each of the eight “precursor” proteins displayed remarkable congruence with the SPD profile of the terminal molecule (CASP-9) in the pathway. These results suggest that classic and complex signaling pathways in cells can also be expressed as combinations of resonance energies.... Here we present evidence that the JAK (Janus Kinase)– STAT (Signal Transducer and Activator of Transcription) pathway, one of the classic signaling pathways within the cell whose final component affects the nucleus, can be described as a resonance pattern that is composed of the spectral characteristics of the pathway that converge at the nuclear interface as CASP-9. The protein interactions can be considered a transfer of resonant energy between interacting molecules through an oscillating physical field that could be expressed within the domain of classic photons. (Persinger, 2015, 245)

As we have previously seen Akimov Generators have been replaced with Lasers and LED quantum generators, in Russian research in Psychotronics from the late 1990s. It is interesting that the RRM occurs in the frequency range from Infrared to visible to Ultraviolet waves. A further implementation of the RRM using LEDs is to use this methodology to fight viruses, not just remotely influence one's thoughts, Persinger has written on treating viruses using Cosic Resonance using LED lights. In studies it has been used on Ebola as a model, could be investigated for Covid-19, see (Persinger 2015b) and further others using appropriately patterned monochromatic (Narrow band) LED to fight Zika virus (Caceres 2018).

Although, as important it is to fight infections and viruses, the most important point as this technology relates to Neuroweapons is that it is a viable explanation as to how without drugs or other direct chemical interdiction that EM waves. Dr. Bandyapadhyay, in research underwritten by the United States Air Force, has related how this alternate pathway interacts with neurons which produce a stream of binary information:

A neuron gets hot and then cold (5–6 THz electromagnetic frequency domain) when it fires or sends a nerve spike ([Abbott et al., 1958](#)). Electromagnetic effect on neuron has been studied extensively as it modulates the firing rate ([Camera et al., 2012](#)) and even ion channel pathways ([Li et al., 2014](#)). Two neighboring neurons communicate electrically similar to wireless communication ([Katz & Schmitt, 1940](#)), and a neuron's sensitivity to the electric fields depends on the frequency of firing ([Radman et al., 2007](#)). While inserting an atomic sharp scanning tunneling microscope (STM) tip vibrating at low sinusoidal frequency (30 Hz) inside a single protein at resonance or a protein complex deep inside axon of a rat hippocampal neuron during a firing we observed a stream of binary pulses. In Fig. [4\(a\)](#) we have shown two binary streams one for protein complex in the axon core (see B) and the other for a neuron membrane (see A) measured by using an atomic tip. Obviously, there happens to be a communication in an electrically resonating protein complex in the axon of a neuron whose membrane is resonating a bit later. The Fourier transform of the streams of binary pulses occurring at apparently random time gaps resembled the electromagnetic resonance frequency band measured by us following other routes ([Sahu et al., 2013a,b, 2014](#); [Ghosh et al., 2014](#)). This was a surprising observation, and we confirmed this by putting several electrodes and

patch clamps simultaneously [Fig. [4\(b\)](#)], we see live a new form of communication that runs through a pair of neurons and

Grouping of the resonance frequencies: Molecular biology has not yet incorporated the supremacy of thermal effects (5–6 THz absorption, 22–23 THz emission as noted above), but grouping of peaks or nesting of frequencies is what we have observed over the years when we see 1012 Hz bandwidth of response simultaneously [Figs. [8\(a\)](#)–[8\(c\)](#)]. Resonance frequency \ Peaks groups together activate together", is analogous to the historic \neurons wired together fire together". See the groups of resonance peaks in Figs. [5\(c\)](#), [5\(d\)](#), [6\(b\)](#), [8\(d\)](#) and [8\(e\)](#), one could find the existence of triplet of triplet (3 3 ¼ 9) bands. There are various forms of grouping and that is revealed only when we look at the entire frequency bands from micro-hertz to terahertz simultaneously. Prior to us, no one looked into the entire em band simultaneously, continuously, so no one saw the complex temporal evolution of resonance band. (Bandyopadhyay, 2016)

The greatest criticism leveled against anyone claiming that Neuroweapons are real, in development and being used is the arguments based on scientific refutation of such phenomena being possible. Critics of claims of neuroweapons will point out for instance that the EM cannot influence molecular activity, like the use of chemical compounds, or another criticism is that you need Line-of-Sight to target and follow anyone, that these signals cannot keep up or penetrate the many obstacles in their way. These are two of the more common arguments put forward by those invested with denying in any way the reality of Neuroweapons. So it is without question that there are indeed historical, scientific and social pointers to the reality of these weapons and their use. In this section I have primarily relied on the technical issues to show that the disinformation, and I can only conclude it is disinformation, is patently and easily shown to be false to the critical researcher or interested party.

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