Address

EXPLORING THE HEART AND AETHER IN ENERGY MEDICINE

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ABSTRACT

The heart is presented as the energetic center of the human subtle energy system that plays a coordinating role in human physiology beyond its accepted role as a cardiovascular pump. As the body's most dynamic field integrator of life energy, the heart plays a formative role in the creation of the new paradigm of energy medicine. This paper explores the role of the heart in cardiovascular functioning, healing, cognition and subtle energy modulation. Water and blood are shown to play a central role in mediating consciousness and intention. A hypothesis is presented that the heart utilizes diverse subtle energy and electromagnetic regulatory processes to coordinate complex information flows within the body and the environment. A new model of a non-material higher-dimensional Planck aether developed by Klaus Volkamer is presented based on research of anomalous mass determinations with subtle energy detectors. The heart becomes a metaphor for the new synthesis between science and spirit that was the theme of the 2009 ISSSEEM conference.

KEYWORDS: Heart, subtle energy, aether, water, homeopathy, quantum physics, energy medicine, electromagnetic, intention

I am deeply grateful to be here with all of you today exploring a subject that is of great personal interest. I would like to dedicate this talk to the memory of my late mother, who passed a little over a year ago. Her spirit of inquiry has guided much of my life.

The word "sacred" means to consecrate, to make or declare holy, something worthy of veneration. Synthesis is the combination of disparate elements into a whole or unity. I believe that this year's conference theme, "Sacred Synthesis," reflects this essential yearning at the deepest level of science, involving both the metaphysical and the physical sciences. Looking over what has been achieved in scientific investigation during the last 150 years, I believe we really need a new model now for the nature of subtle energies. Eastern traditions have always understood that these subtle energies are the foundation out of which we arise through consciousness. Modern string theory today has up to ten (or in M-theory, eleven) dimensions to describe reality without any reference to past work about the aether. I would like to revisit this subject today, so the title of my talk is not just about the heart, but also about the aether, which science has somewhat neglected, eliminated or replaced with the quantum vacuum. I think that this was potentially a mistake; at least it created limitations for modern science.

We need rigorous, definable, testable experimental hypotheses that we can use to investigate these subtle realms. Remember that science doesn't prove any theories; instead it continually tests hypotheses. When scientific theories become outdated, a paradigm shift occurs, as Thomas Kuhn wrote about in his book *The Structure of Scientific Revolutions* (Kuhn 1962). Richard Feynman, the Nobel laureate for his theory of quantum electrodynamics said, "Science is the belief in the unknowingness of the experts." Although he was a genius, he was also somewhat irreverent.

I intend to first look briefly at the macrocosm and then the microcosm, following the old dictum "as above, so below." Then we will look at the heart as it informs the water in our living bodily matrix. Later I will present some very provocative research on anomalous mass changes discovered after decades of experimental work in Germany that have led to a new model of the aether. This is a new non-material aether, which already conceptually emerged from Einstein's thinking early last century.

First, let me introduce a more cosmic perspective. Once we sent up the Hubble space telescope, astrophysicists started to discover that the universe was made up of a lot more stuff they did not understand. In fact, dark matter and dark energy together are today considered to equal 96% of the stuff that makes up the universe. Specifically, 23% of the universe supposedly is dark matter whose nature is not well defined at all, and 73% is dark energy, which science knows is there but doesn't know what it is. All the remaining matter and energy that we know something about comprises only 4% of our total reality. So there is lots of room

for new understanding when only 1/25th of what we can directly quantify with our scientific instruments can be incorporated into our accepted scientific theories.

Let us start with the sun. From an esoteric perspective, the sun is the nearest great heart of the macrocosm. It is the origin of all our life force. Once we sent the two Pioneer spacecraft past the sun, we started to discover an undulating heliospheric current sheet, the largest structure in the solar system, shown in Figure 1. It results from the influence of the sun's rotating magnetic field on the plasma in the interplanetary medium (called the solar wind). Figure 2 shows this spiraling pattern associated with the sun, as seen from above, resembling the yin yang symbol of ancient Chinese cosmology. The ancient Taoists, however, saw these matters with their inner sight, not with outwardly directed scientific instruments.

Scientists have recognized that sunspot cycles are about eleven years long, as seen in Figure 3. You can think of this as an eleven-year cosmic heartbeat of increasing and decreasing magnetic activity. We are at a low point in this cycle right now, with few visible sunspots forming. Scientists had predicted that the current cycle (Cycle 24) was expected to have even greater magnetic activity than the last sun cycle that peaked in 2000. Paradoxically, the sun is at this time (July 2009) unusually quiescent, in fact abnormally so. It actually feels like the calm before an approaching storm. Something big is potentially going to shift by 2012. It includes, of course, the ending

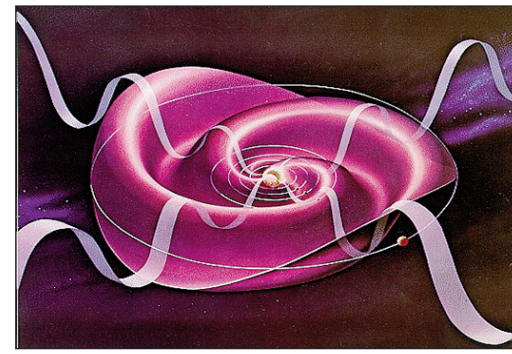


Figure 1. Warped current sheet of the sun

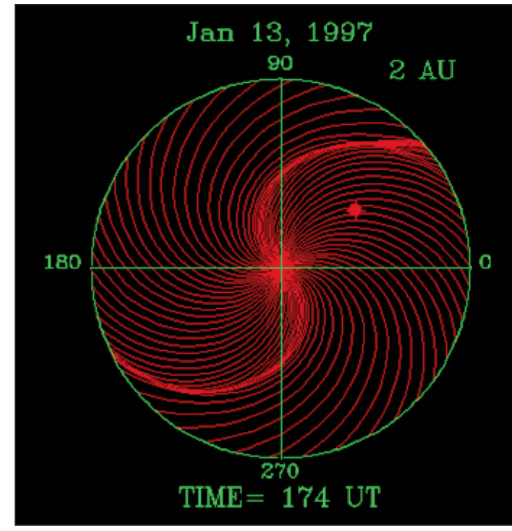


Figure 2. Sun's rotating plasma sheet out to two astronomical units

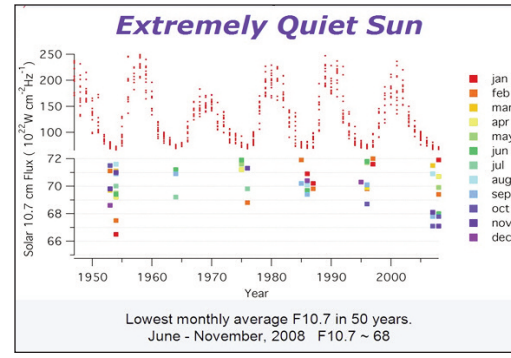


Figure 3. 10.7 cm flux from sun showing eleven-year solar rhythm

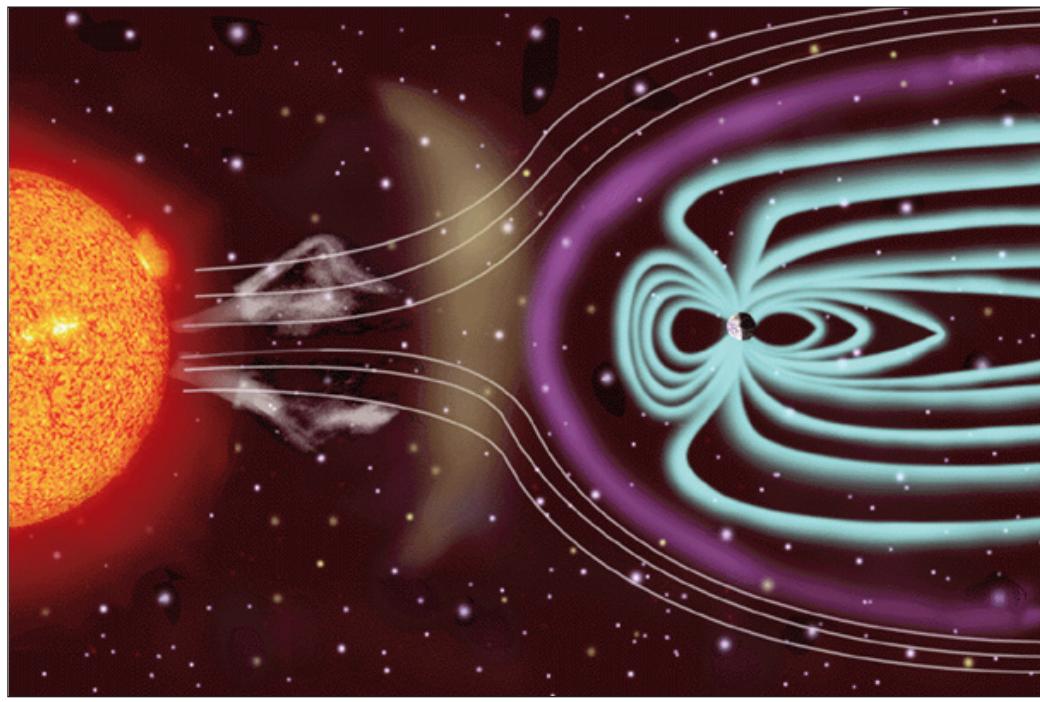


Figure 4. Artist's conception of solar wind impacting earth's magnetosphere (not to scale)

of the Mayan calendar as foretold by the ancient Mayan cosmologists.

From a western scientific perspective, the solar wind is an emanation from the sun that is constantly impacting the earth (Figure 4). Scientists have recently made a very interesting discovery relating to the sun's magnetic linkage to the earth. Once space scientists sent up the European Space Agency's Cluster spacecraft and NASA's THEMIS probes, they discovered these periodic magnetic links between the sun and the earth called magnetic flux transfer events. A magnetic portal opens to the sun every eight minutes. This portal is in the shape of a magnetic cylinder about the width of the earth and, interestingly enough, it takes eight minutes for light to travel from the sun to the earth. In essence, this appears to be an eight-minute "heartbeat."

The earth itself is a very complex magnetic being, which like the heart, has a powerful field that shields us from adverse solar radiation. The earth's magnetic field has been weakening, which allows more solar emanations to influence the earth. In fact, multiple magnetic poles are now appearing – south magnetic poles in the northern hemisphere and north magnetic poles in the southern hemisphere. We are living in a time of great transition, which may involve a magnetic pole shift in the coming years or centuries – something that has occurred many times in the past, according to geological research.

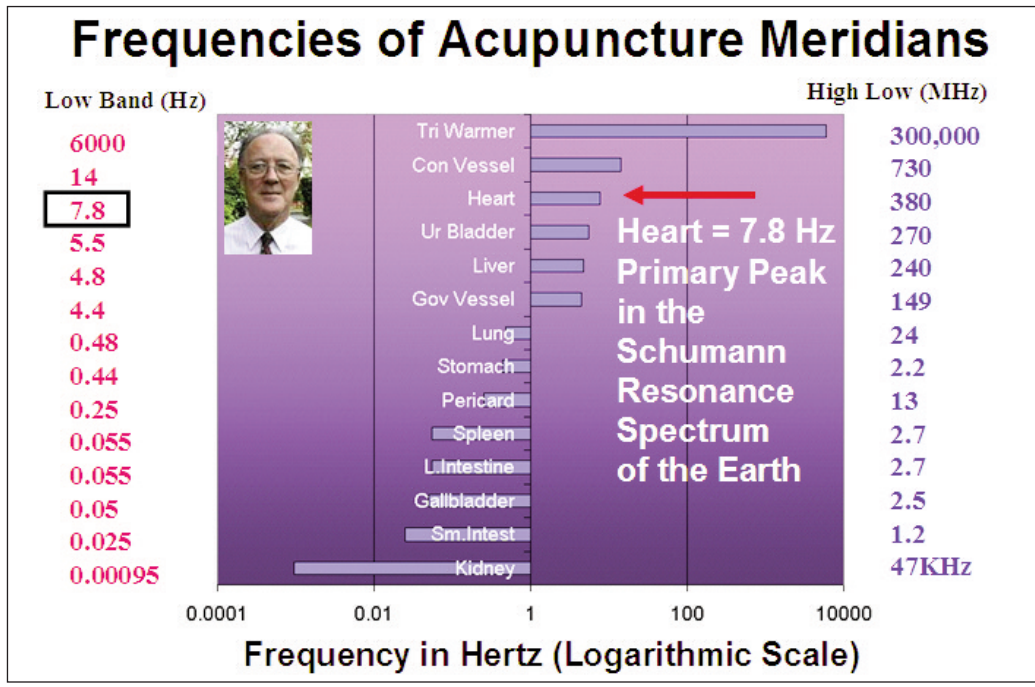


Figure 5. Frequencies associated with acupuncture meridians, determined by Cyril Smith

The earth's magnetic field appears to be subtly connected to our acupuncture meridian system as well. Cyril Smith, a British researcher formerly from Salford University, published an interesting paper where he showed that the heart meridian (one of the twelve meridians) has a frequency of 7.8 Hertz or cycles per second (Smith 2004). I have plotted the frequencies of the acupuncture meridians found by him using a logarithmic scale (Figure 5). What is interesting is that the heart meridian frequency corresponds to the primary Schumann resonance, which represents a cavity resonance between the ionosphere and the earth. The first peak of that ELF resonance spectrum is around 7.83 Hertz. However, this primary resonance frequency varies slightly every day. This frequency is at the boundary between the theta and alpha brain wave regions. The brain also has a magnetic connection with the earth, because the brain has magnetite crystals inside the dura mater (the outer layer of the brain covering), which is capable of responding to external magnetic fields (Kirschvink et al. 1992). From a certain perspective, one might say that the whole body serves as a magnetic sense organ, and the heart and brain are both connected to the earth.

Moving now from the macrocosm to the microcosm, notice that in English the word E-A-R-T-H has the same letters as H-E-A-R-T. Our heart serves as a metaphor of our true

humanity. In pre-Christian times, the emotional and mental character of a human being was attributed to the heart. In Hebrew, the word for heart is "leb." It is the center, supplied with spiritual and mental aspects, which uses the sense organs of the eyes and the ears to sense or notice the order of value of things. As the famous French scientist Blaise Pascal said, "The heart has its reasons that reason knows not."

Let us re-envision the heart for a moment as that wonderful organ in our bodies that serves as the center of our energetic system. Our understanding of the heart changed a lot around 1628 when William Harvey, for the first time, described the pulmonary and systemic circulations as interconnected. He wasn't the first one who thought about the circulatory system. In 304 BC Erasistratus described the valves of the heart, and in 165 AD Galen discovered that blood, not air, flows through our arteries. Pulmonary circulation was first described by Ibn al-Nafis in 1242, and later by Servetus in 1553. Systemic circulation was described by Cæsalpinus in 1593. But it was Harvey who put it all together. In some circles he is known as the first scientist who applied quantitative approaches to biology. Today we attribute the notion of the heart as simply a pump to his work. I believe this is an oversimplification of the true nature of the heart.

Can a mechanical heart really replace a physical living heart from a donor if you need a heart transplant? In a mechanical pump, when you increase the pressure, you generally get more flow. When the first mechanical hearts were built and used in humans, something unexpected happened. When they increased the blood pressure, the flow (specifically the cardiac output) actually went down. So it is not really true to say the heart is a pump. This research with mechanical hearts was first published in JAMA back in 1988 (DeVries 1988).

Other interesting observations were made when they started transplanting hearts. Occasionally, the heart transplant recipient appeared to have unexplained memories associated with the donor of the heart. Some recipients noted behavioral changes, different habit patterns, or craved different foods that were not part of their former regimen. One of the most dramatic examples described in *The Heart's Code* (Pearsall 1998) was the story of an eight-year-old girl who received a heart from a ten-year-old girl who had been murdered. After she recovered, the heart recipient had dreams about the man who had murdered the little girl whose heart was donated after her murder. Ultimately, with exact descriptions including the time, place, murder weapon and clothes worn by the murderer, the recipient girl helped the police find and convict the man who killed the girl whose heart she had received. Gary Schwartz and Linda Russek, who have collaborated with Pearsall, also wrote about the unusual nature of the heart in their book *The Living Energy Universe.* They call this unique phenomenon systemic memory, and develop a provocative theory about it (Schwartz & Russek 1999).

Let us look further at some interesting facts about the heart. Every creature on earth has about two billion heartbeats in a lifetime. The biggest heart on earth resides

in the blue whale, with valves the size of saloon doors. Fish have two-chambered hearts, while amphibians get by with three-chambered hearts. The four-chambered heart begins to develop in reptiles, but the two completely separate circulations make their initial appearance in the crocodile. Only in birds and mammals do we always find the four-chambered heart. And while the heart is primarily a muscular organ, it is important to remember that three-quarters of the heart is made out of water.

From birth to adulthood, the mass of the heart increases 30- to 50-fold, mostly from an increase in cell size. Most of your heart cells are the same heart cells that you had when you were born. Heart cells regenerate at a very low rate, falling from a rate of 1 percent renewal per year at age 20 to 0.4 percent per year by age 75. For example, if you are fifty years old, fifty-five percent of your heart cells are still present from birth. If you have a heart attack, the heart principally heals by the formation of scar tissue, not by the formation of new heart cells. This fascinating research was just published this year in the journal *Science* (Murray & Lee 2009).

Heart cells also have unique nuclei; generally they have double the DNA of other cells. Most of this DNA appears not to be used for replication, since heart cells have this low reproduction rate. This confronts us with a mystery as to what other functions the polyploidy (extra genomes) in our cardiomyocytes (heart cells) might have. Although some Russian research suggests that it may be related to oxidative stress in the heart (Anatskaia 2004), German researchers such as Fritz-Albert Popp suggest that DNA functions similarly to a laser, and plays a vital role in the biophoton regulation inside cells. This offers us the opportunity to see the heart as intimately connected with the living light communication processes in our body mediated by biophotons (Bischof 1995).

The organ of the heart is a most unusual community of cells. It is called a functional syncytium, meaning a meshwork of muscle cells interconnected by contiguous cytoplasmic bridges. Thus, an electrical excitation occurring in one cell can spread to neighboring cells. The heart cells work in a coordinated manner, a community of cells that are a model of collaboration. The heart is a living symbol of our working together as a heart-centered community.

The heart can be considered to be the center of the body's biomagnetic and subtle energy field. We now have high technology magnetometers, including the superconducting quantum interference device (SQUID), which can very accurately measure the heart's magnetic field. This is called a magnetocardiogram (MCG). It's analogous to an electrocardiogram, which measures the electrical field signature produced by the heart – which can be picked up with conductive electrodes anywhere on the body. What researchers found is that the heart's electrical field (ECG) is around sixty times stronger than the brain's electrical field measured with an electroencephalogram (EEG). However, the heart's magnetic field (MCG) is up to 5,000

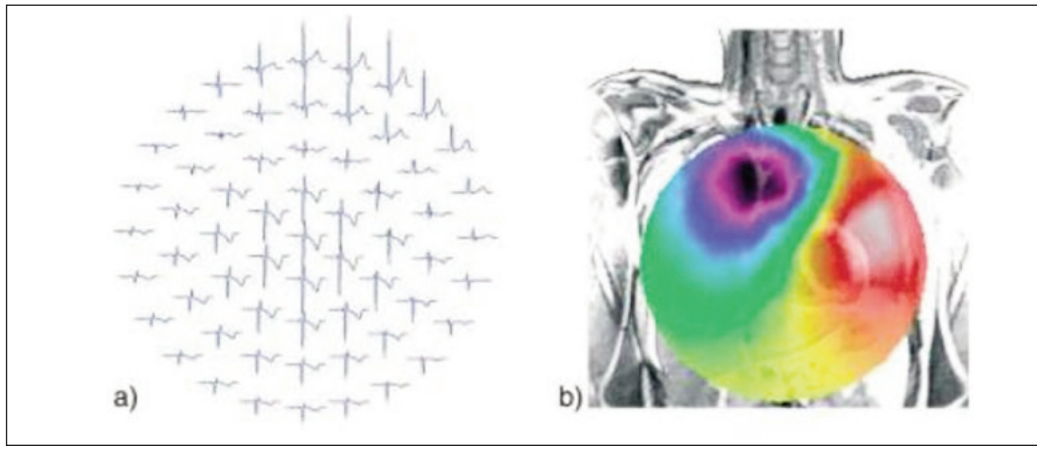


Figure 6. 61 channels of prethoracic magnetocardiogram (left); magnetic field map of the heart at Q-wave (right)

times stronger than the brain's magnetic field called the magnetoencephalogram (MEG) (McCraty 2001).

An image of the magnetic impulses associated with a 61-lead prethoracic magnetocardiogram (MCG) and the associated magnetic field map of the heart at the Q-wave onset are shown in Figure 6. What you see here is occurring on a beat-by-beat basis with the magnetic field signal at the moment of ventricular contraction, forming a pattern that resembles a Chinese yin yang symbol. Joseph Chilton Pearce, who was a consultant for the Institute of HeartMath in Boulder Creek, California, once showed a three-dimensional image of the magnetic field vectors surrounding the heart in the chest. In this image, the heart magnetic field somewhat resembled an imperfect toroid, or doughnut shape. An artistic rendition of an idealized set of nested toroidal fields has been used for illustration purposes by the Institute of HeartMath as shown in Figure 7. Nested toroidal structures (Figure 8) have a complex

Figure 7. Idealized picture of toroidal heart field according to HeartMath

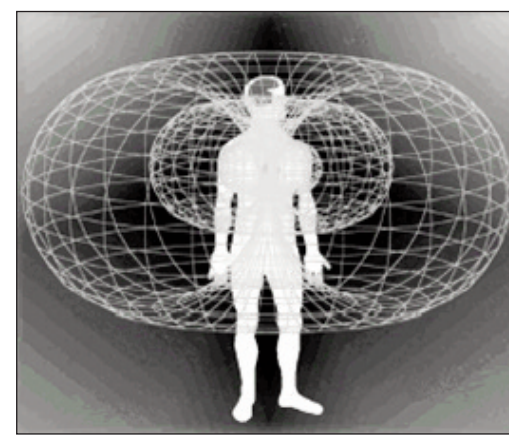
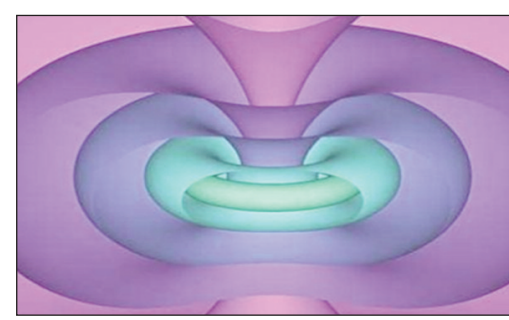


Figure 8. Complex topology of nested toroids



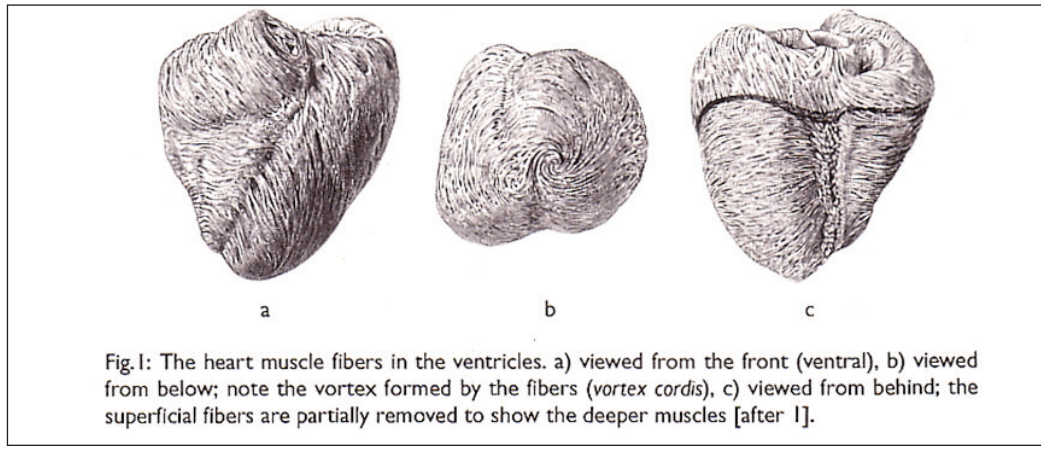


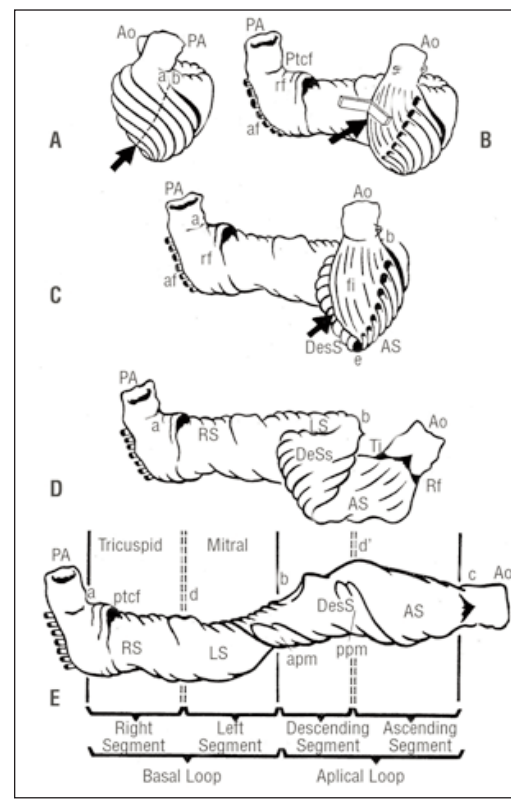
Figure 9. Spiraling muscle fibers in ventricle of the heart

topological structure that can contain extremely high information density. The heart's field may play a significant role in structuring the energetic matrix of the body with complex information flow, which I will illustrate further in this presentation.

The heart's muscle fibers join together in sheets of dynamic spiraling bands. There are seven different layers of heart muscle cells, so that gives us again an interesting correlation. The heart fibers in the ventricle have a spiraling form (Figure 9), with the papillary muscles linked to the valves being connected to the apex or lower pole of the heart. The Spanish anatomist Francisco Torrent-Guasp (1931-2005) dissected the heart along the internal planes of heart fascia. This makes it apparent that the heart muscle forms a complex topology, a kind of knot, which unrolls to form a large continuous band, seen in Figure 10 (Aguilar 2005).

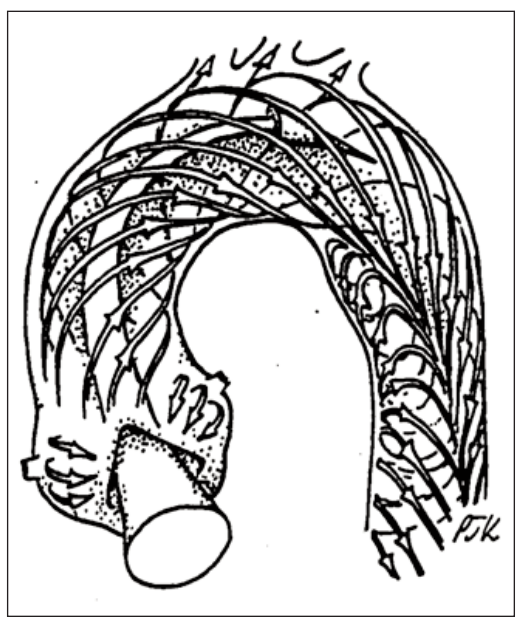
During embryological development, the heart comes from two different cell lines. Essentially, two different heart fields come

Figure 10. Heart muscle unrolled according to Spanish anatomist Francisco Torrent-Guasp



together. So even during its formative stages, the heart's essential nature combines two anatomical poles, suggesting the idea of synthesis at the basis of its anatomical makeup. As the blood spirals out of the heart into the aorta, the geometry in the aortic arch literally vortexes the blood down the aorta with every heartbeat (Figure 11). With each beat, having a stroke volume of about 70 ml of blood, the adult human heart causes about 350 billion red blood cells to move through the ventricles. These massive numbers of blood corpuscles transport vital oxygen to the cells, and in all likelihood also convey tremendous amounts of information from the heart to the energetic body. The Anthroposophical researcher Craig Holdrege has collected a series of essays that offer a new perspective of the heart in *The Dynamic Heart and Circulation.* I would highly recommend this book to you (Holdrege 2002).

Figure 11. Spiral blood flow in aortic arch



ISSSEEM is an energy medicine society, so the first questions to ask may be, "What is energy?" and "What is the energy of the heart?" In physics, the metrology of energy is defined as mass times length squared divided by time squared. Energy has the capacity to do useful work. Energy can also be patterned as information. But is the heart really a pump? The resting heart only uses between six to ten watts of energy. That's not much more than a night light uses. In each minute, the heart only consumes 25 cubic milliliters of oxygen. As reported by Hermann Lauboeck (Holdrege 2002), most of that energy is not used to propel the blood; rather the heart creates tremendous heat during the isotonic heart muscle contraction. It uses only a small percent of energy and oxygen to sustain its own basal metabolic rate. The majority of the energy of the heart warms the blood and streams into the body's watery matrix as infrared heat radiation. So the heart is primarily an organ of warmth, as well as pressurizing the blood streaming through it. Perhaps that is why we say, "I feel so warm towards you" when we express emotions of love and compassion. The heat is generated in the vast numbers of mitochondria that are especially numerous in each heart cell.

The heart is also an endocrine organ. It produces hormones like oxytocin, which are also produced in many parts of the body. It also produces a hormone called atrial natriuretic peptide (ANP), which the body uses to control the circulating volume of

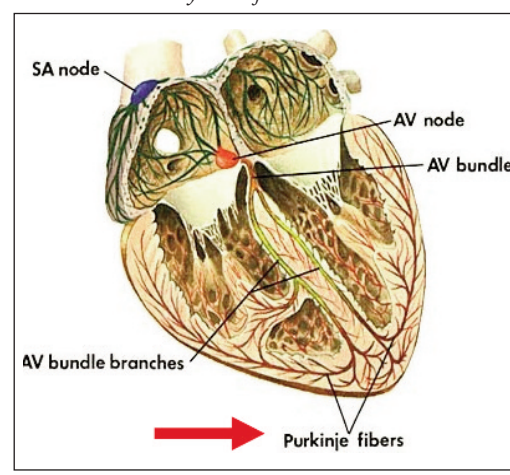
blood. It plays an especially important role in blood loss leading to shock. The heart also has many neuropeptides and hormone receptors, and responds to over 30 signaling molecules. The complex oxytocin regulatory system can actually induce stem cells to become transformed into new heart cells. Oxytocin is sometimes called the "love hormone" because it is involved in pair bonding in rodents. It induces uterine contractions when a woman is in labor. Men produce it after sexual intercourse, and it may also contribute to pair bonding if partners stay connected through a loving relationship. Today there is much research describing this very complex physiological regulatory system that affects many cells in the body.

The heart can also be thought of as a sophisticated neural processor. Some people have called it a small brain because it contains 40,000 cardiac neurons. These are part of the intrinsic neural regulatory system of the heart. A new field called neurocardiology has arisen from the study of this heart nervous system (Armour & Ardell 2004). These neurons are in complex communication with the brain through the autonomic nervous system. They play an important role in heart rate variability, which is increasingly being investigated also in the field of cardiology. This morning we heard from Susanna and Puran Bair about the importance of the heart's rhythm and variability in health.

At our clinical center we use one of the smallest heart rate variability recorders to study the autonomic nervous system. This system, which is smaller than a matchbox, is called proQuant, and was developed in Austria by Dr. Franz Senekowitsch. With this system, we can collect up to two days of continuous heart rate variability data and plot it over time. The computer program that evaluates the data performs a continuous Fourier analysis which then breaks the HRV information into different low frequency bands. These can then be plotted in a time plot over two days to show the degree of stress during both sleep and wake cycles. We found that when some people go to sleep, their sympathetic nervous system continues to stay activated throughout the night. These people get limited renewal from their sleep and their stress pattern contributes to long-term illness, especially heart disease.

Next I want to present the interesting and complex conduction system inside the heart called the Purkinje fibers (Figure 12). This is the rapid conduction system of the nervous impulses associated with initiating muscle contractions. What is fascinating is

Figure 12. Purkinje fibers in conduction system of the heart



that these fibers are actually muscle cells that have transformed themselves into nerve cells. The physicist Elizabeth Rauscher, who carried out research with her late husband William Van Bise on this, found that they could induce external pacing of the heart with magnetic stimulators they invented. Their system does not require an electrical pacemaker to be located inside the heart.

The system patented by Dr. Rauscher involves a magnetic pulsing system located near the cerebellum, the back part of the brain. Some of the longest nerve fiber networks are located in the cerebellum. Interestingly, these are also called nerve Purkinje cells, but they are quite different from the Purkinje conduction system in the heart. The cerebellar Purkinje cells have up to 200,000 parallel dendritic fibers or branches. They also release unique chemicals called endocannabinoids. One may visualize this branching network as forming part of an antenna system that may respond to coordinated field impulses. When you magnetically pulse this system at a specific frequency and impulse pattern, you can actually pace the heart externally. This new experimental finding has not yet been widely recognized in cardiology or made commercially available (Rauscher 1988, 2009).

So, if you want to create a heart to act as a sensory organ, what would you need? You would need nerve fibers that rapidly conduct the heart signal (Purkinje fibers). You would need a nerve network inside the heart as is now being described in neurocardiology. You would need signaling pathways to the brain including myelinated and unmyelinated fibers that go to different cell nuclei in the brain stem. Stephen Porges Ph.D. at the University of Chicago has referred to this expanded autonomic nervous system as the polyvagal nervous system or the Social Engagement System (Porges 1994, 1998, 2003).

You would also need something that can generate coherence in the body, specifically, coherent soliton or lossless energy transference through the matrix, described by Davydov (Davydov 1986). You need the unique communication system operating around 7.6 Hertz that Dr. Rauscher has found. You need to make this entire communication system immune from external electromagnetic influences. This will be described shortly when I discuss the scalar wave research of Dr. Meyl in Germany. He believes that many devices such as our cell phones stress the body and the heart (Meyl 2003). There is now some evidence that this microwave radiation, and possibly scalar waves, adversely impact heart development in utero.

I believe the heart acts as a coherence generator throughout the connective tissue matrix, creating pressure waves, sound waves, light and infrared radiation, and a complex topology of magnetic and electrical fields. All of these fields and waves impact the connective tissue matrix. The heart has high informational and subtle energy density that we are only beginning to investigate. The heart maintains this complex field structure 24 hours a day, seven days a week, 365 days year after year.

So the hypothesis is that the heart also acts as a transducer of subtle energy from the non-material realm, from a realm that I will later describe as the relativistic aether. The aether concept is not really dead; rather it needs to be seen from an expanded non-material perspective. If this can occur, the aether will give us, I think, one of our bridges toward spirit. Before we get there, let us examine the measurable energetic heart a little further.

If we study the heart's electrical rhythm, which we use to determine the beat-to-beat variable interval called heart rate variability, we know that it originates from a central pacemaker called the sinoatrial node, and is then modified by the atrioventricular node. As I mentioned, we can pick up this ECG signal all over the body. Traditionally, cardiologists interpret this strong electrical nervous impulse as a depolarization and repolarization signal created by ionic flows accompanying muscle contraction. Some scientists believe that there is more information in that signal – that the rhythm of the heart over time has a powerful effect on our body and brain, while simultaneously reflecting our emotional state.

Roland McCraty at the Institute for HeartMath (and others) have found that if you perform special signal processing of the EEG from the brain, the heart signal can be detected from the signals emanating from *inside* the brain. They have also shown that the heart's signal can be used to reliably anticipate information being presented to the brain, including images randomly selected by a computer. In other words, this work seems to suggest that the heart appears to have some precognitive ability and is able to "sense" whether pictures randomly appearing on a screen have a neutral or strong emotional content. They have been deeply involved in this type of frontier science research and I greatly value their work (McCraty 2004).

I began to ask if there might be useful information content in the time rhythm of the ECG signal in the context of HRV. If you perform sequential Fourier spectral analyses of the heart rate variability signal and plot it on a waterfall plot, it can create an image resembling a series of mountain peaks over time. However, along the frequency axis you also see a regular series of little peaks that represent the frequency components within the ECG waveform. These frequency components are present because the ECG with its prominent QRS complex is essentially an impulse function. A pure impulse or sudden spike contains an infinite number of harmonics which have less and less amplitude as the frequency increases. The lower frequencies typically have the highest amplitude. As you examine this plot of frequency against time (Figure 13), you can see these different frequency components as a series of repeated bands within these peaks. So I would suggest that the heart rate signal contains information that is more complex than the depolarization and repolarization signal that is usually talked about. Essentially, the heart creates very powerful magnetic and electrical fields containing many different frequency components that constantly influence the connective tissue matrix. We know that we can pick up the raw ECG signal from within the tissues as

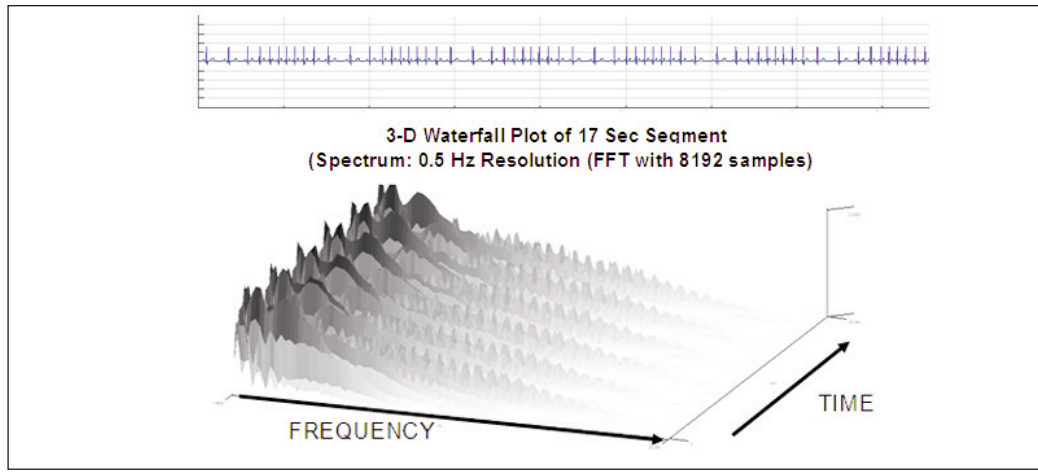


Figure 13. Waterfall plot of spectral analysis of heart rate variability

well as on the surface of the skin. I submit that the heart's signal is part of a complex body communication system that influences many physiological systems, including the brain and autonomic nervous system. It is important to remember that these signals all flow through an aqueous medium – the water in our living matrix. I particularly like to quote West Marrin from his excellent book, *Altered Perception,* who wrote, "Liquid water is not just the solvent for earthly life forms; it is the actual matrix within which all biological structures and processes exist . . . Earthly life may be seen as animated water . . ." (Marrin 2006).

These processes that occur in our watery matrix also involve biological quantum processes. Mae-Wan Ho, Rustum Roy and William Tiller have all talked about the importance of water and these processes in their work as well as at this conference. (Tiller 1993, 1995, 1999; Ho 1994, 1998; Roy 2005). It takes place inside the cellular structures where many interesting things occur, especially at phase boundaries within cell components and the associated hydration layers. Some scientists think that the minute microtubules play an especially important role (Hameroff 1996). Others believe that this matrix may have holographic properties. Dr. Ho writes about a fluid genome capable of reorganizing itself and steered by epigenetic signaling. She also writes about the liquid crystalline nature of this matrix. The matrix is excited by coherent signaling waveforms that travel with very little attenuation of intensity as soliton waves. And the matrix appears to have qualities that are fractal in nature.

The biophysicist Freeman Cope proposed in the 1970s that physical processes in the body operate through solid state physics. It was these processes that became well understood in the computer and laser industry (Cope 1973, 1975). Perhaps the earliest pioneer was Albert Szent-Györgyi, the mentor of Dr. James Oschman when they worked together at the Woods Hole

research institution. He was the first to suggest that proteins have semiconductor-like properties (Szent-Györgyi 1941, 1960).

From all this foundational work one might develop an image of the living matrix as a complex mass of parallel processing quantum computers that work nearly at the speed of light, processing complex, nearly lossless, information flows. The matrix has many properties demonstrating piezoelectricity, pyroelectricity, and even quantized Hall effects (Oschman 2000, 2003). There may even be body temperature superconductive processes occurring in the body. Dr. Frank Barr made the suggestion that melanin, the pigment in our skin that is also found in our brains, may act like a superconductor organizing many functions in the body (Barr 1983). We also know that there are many different types of communication processes occurring in the body. These involve a variety of waveforms including solitons, phonons, longitudinal waves, biophotons, plasmons, polarons, charge density waves, and so on, that create an almost infinite number of resonances, standing waves, spherical waves and others. The entire symphony of life is very, very complex.

The great quantum physicist Niels Bohr once said, "What we observe is not nature itself, but nature exposed to our method of questioning." Dr. Mae-Wan Ho echoes these sentiments when she says, "Physics is what we can say about nature, not how nature really is." I believe it is the quest of this society to find new ways to ask questions and to utilize the best of the biophysical sciences in investigating the energetic and informational realms within our expanded being.

One place to begin is to study water from many perspectives. Water is affected by almost everything: physical substances, sound and electromagnetic forces, and subtle energies, including gaining an understanding of how water flows in nature to regenerate and energize itself. The nature of its fluid dynamics including moving in a vortex is important here. Let us begin by examining the physical aspects of water.

Water's electron structure is tetrahedral. That means it's like a three-sided pyramid. When water molecules organize themselves in a fractal manner, they arrange themselves so that four molecules of water reside at four corners of a tetrahedron again. When water molecules link together through their hydrogen bonding patterns, they are called water clusters. Although these clusters were first thought to be very transient, we now recognize that they can maintain a resonance structure for a considerable time. Water is affected and organized by whatever water touches, flows through or is dissolved in it.

Water clusters form in various aggregates: dimers, trimers, ring structures, icosahedral structures, and so on. Martin Chaplin at South Bank University in London has described these in great detail (Chaplin 2007). Certain scientists are beginning believe that water clusters are associated with the mystery of how information is structured within the water – the memory of water. These clusters form resonance structures lasting a considerable time, even

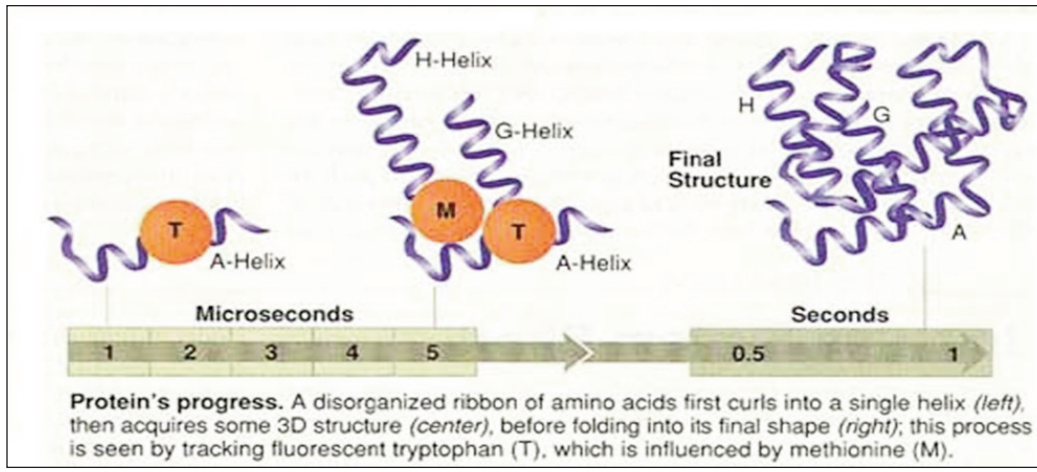


Figure 14. Time course of protein synthesis determined by terahertz absorption spectroscopy

though individual water molecules may come and go in a dynamic dance. Rustum Roy, whose work I deeply appreciate, explains that they're like a complex alphabet of resonant information storage that organizes itself so that it can communicate information. In this way, water molecules are analogous to the letters of an alphabet which join together to make words. By analogy, the clusters may further organize themselves just as words make sentences, comprise books and create language. The bio-tensegrity matrices and geometrical structures within cells and the connective tissue that were so beautifully illustrated in Dr. Steve Levin's talk this morning reminded me of how water is the basis of life and displays these same spatial arrangements.

Let us never forget that every protein in our body is surrounded by a matrix of water molecules. All amino acids that make up this protein are involved with complex hydration patterns, with the water acting as the mediator between all cell organelles. Science has now invented lasers, called Terahertz Lasers, that turn on and off a trillion times per second. These new lasers are now being used to probe the hydration patterns of proteins as they are being assembled, utilizing Terahertz absorption spectroscopy. Scientists are interested in finding out how fast proteins fold themselves up and how water is involved in this process. Apparently this occurs not only through the interacting electrical charges on the amino acids that make up the proteins, but through the water facilitating this process itself. Using very fast laser light pulses, the time sequence of this process can be studied (Kim et al. 2008). In Figure 14 you can see an alpha helix forming in a matter of microseconds to milliseconds. The proteins also stay organized through the surrounding hydration matrix. In essence, water gives protein its information.

Water is also influenced by sound and electromagnetic forces. We use new technologies to visualize things through ultrasound, through x-rays (which are high energy electromagnetic waves), through thermography (which are lower energy heat waves), and through magnetic resonance imaging (which is radio frequency radiation inside very powerful magnetic fields). All of these affect water, and work through the watery matrix in the body.

But there is another way to look at electromagnetic wave phenomena. That was the genius of Nikola Tesla, who gave us our modern electrical power generation. Tesla initially worked for Thomas Edison, and later ended up in a battle with Edison about Tesla's alternating current power transmission technologies that we use today. Edison was a proponent of the less efficient direct current technology he invented. Compared to Edison, not many people remember Tesla's contributions to our world.

Tesla talked about a different type of wave transmission called longitudinal wave resonance transmission. These "Tesla radiations" are different from the Hertzian or the transverse waves initially described theoretically by James Clerk Maxwell. Transverse waves were later experimentally confirmed by Heinrich Hertz. Today, only transverse waves, in which the electrical and magnetic field vectors are at right angles to each other as well as to the direction of propagation, are exclusively used to describe electromagnetic wave transmission without considering any other possible waves.

Dr. Konstantin Meyl, a physicist and electrical engineering professor in Germany, did some recent work with Tesla waves. Meyl bases his theoretical work on a Laplacian wave equation written in an extended form. The terms of his equations include both the accepted magnetic field vortices of traditional electromagnetic theory as well as a new term called the potential vortex. He has written two books about this, utilizing standard electromagnetic terminology (Meyl 1990, 1992). He has also replicated some of Tesla's experimental work involving these longitudinal wave phenomena. Controversially, Meyl coined the term scalar waves in describing these types of radiations. He suggests that biological processes, including nerve conduction in myelinated fibers, operate by utilizing these scalar waves (Meyl 2003).

I wanted to mention this work to suggest that there is such a thing as a longitudinal or non-Hertzian wave transmission, and that it can be mathematically modeled. One can, in fact, transmit energy wirelessly through the air, as Tesla had done in early part of 20th century. This type of wireless transmission is currently being investigated at the Massachusetts Institute of Technology. Meyl has replicated some of this work, and demonstrated how Nikola Tesla could hold a light bulb in his hand and allow the high frequency field to light it up through resonance processes. The body essentially becomes the resonant receiving antenna for the radiations produced by a Tesla coil transmitter. Tesla impressed many people in his day who wondered how light bulbs (and fluorescent lights) could be lit without wires being attached to them.

The scalar waves that Meyl describes can travel at various speeds of propagation. We know that electromagnetic waves, including light, travel at around 300 million meters per second in a vacuum and slightly slower in air. In fact, the inverse of the square root of the product of magnetic permeability in a free space (μ_o) and the permittivity of free space (ε_o) define the speed of light ($c_o = 1 / \sqrt{\mu_o \varepsilon_o}$), as Maxwell had first suggested. This applies for all transverse electromagnetic wave propagation. But longitudinal waves or scalar waves travel in a different manner and form resonances between the "sender" and "receiver." According to Meyl, they can propagate at slower or faster rates than light speed. He believes biological systems use these types of waves for greater efficiency, including the biophotons that are involved in steering biological processes. Meyl works with flat planar coils that were first developed by Tesla as a potential solution to transfer power using high frequency scalar waves.

His technology has also been successfully adapted by the German homeopath and biochemist Dr. Karen Lenger to measure homeopathic potencies with great accuracy using magnetic resonance methods and sophisticated spectrum analyzers in shielded Faraday cages (Lenger 2004). What is exciting is that these types of experiments using non-Hertzian waves are beginning to build an experimentally verifiable foundation for complementary medicine modalities such as homeopathy. This helps to put energy and informational medicine on a sound scientific basis.

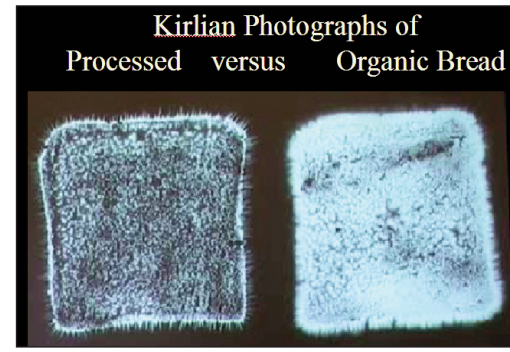


Figure 15. Kirlian photographs of breads; processed on left, organic on right

Meyl suggests scalar waves propagate as magnetic vortices along nerves. Specifically, the myelinated nerves, with their regularly-spaced nodes of Ranvier in the myelin sheath, are not only speeding up the electrical nerve action potentials, but are simultaneously wave guides for these magnetic vortices inside our nervous system. I believe the magnetic nature of our bodily tissues, with their unique magnetic permeability and dielectric constants (which are frequency dependent), require much greater research to fully understand the complexity of our energetic nature and the laws of vitality.

Over a hundred years ago, Tesla invented coils that generated high frequency fields that Tesla hoped would ultimately lead to a new electromedicine. Today they are used in gas discharge visualization devices developed by Dr. Konstantine Korotkoff, essentially a computer-based form of Kirlian photography, to demonstrate energetic phenomena with high voltage fields. They have been used in the past to excite a cut leaf and show a phantom leaf effect. In Figure 15 this technique has been applied to

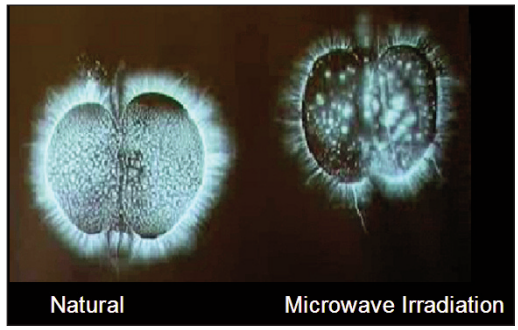


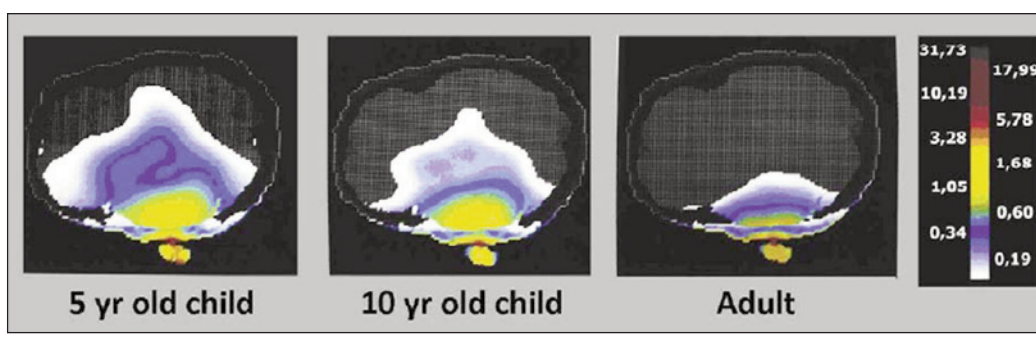
Figure 16. Kirlian photographs of cut apples; natural on left, after microwave irradiation on right

qualitatively evaluate processed bread compared to organic bread. A Kirlian image of a natural apple is quite different from one that has been exposed to microwave heating, as seen in Figure 16. It is thought that a greater corona discharge pattern or "brighter" image is correlated with greater natural vitality. From that perspective, the organic bread and the non-microwaved food appear to be more desirable.

Before leaving this examination of electromagnetic radiation and water, it is worthwhile to just mention the tremendous changes that have taken place in our daily environment through the introduction of widespread microwave communication, especially with the introduction of cell phones and wireless computing. This microwave radiation can penetrate children's brains much deeper because of their thinner skull bones and brain water characteristics. Figure 17 shows an estimation of the penetration of 900 MHz radiation into the brain based on age. You can see that electromagnetic radiation from a cell phone penetrates more deeply into the skull of a 5-year-old than a 10-year-old child. It does not penetrate as deeply into an adult because of their thicker skull bones. Children's brains are constantly developing and still differentiating, so this form of radiation can potentially adversely affect them to a greater degree.

Even more disturbing is preliminary data coming out of Sweden, where they have tracked the incidence of congenital malformations and correlated it with the usage rate (speech time) of cell phone users. Epidemiological researchers found that while the overall incidence of congenital malformations had shown an overall decrease between the 1970s and 1998, that trend was broken when cell phones became

Figure 17. Estimated brain penetration of 900 MHz electromagnetic radiation with age



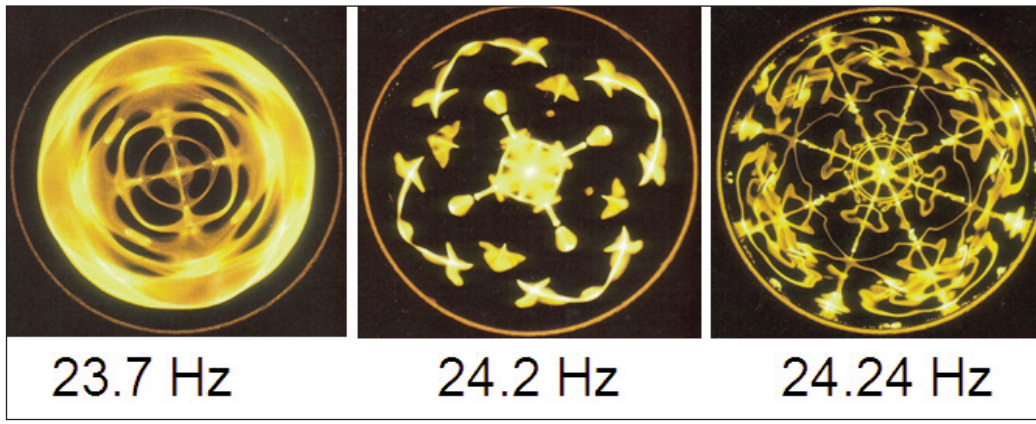


Figure 18. Frequency dependence of water cymatic patterns according to Lauterwasser

more widely used. Specifically, the number of heart malformations has been rising steadily since 1998 (Hallberg & Johansson 2009). Perhaps there is a correlation between microwave radiation exposure from cell phone use or background radiation in that country and the development of the heart in utero. I wanted to present this data in the context of this presentation about the heart and its sensitive nature. A word of caution about the appropriate use of these technologies may be wise.

Another important area to just mention is the power of sound and the use of sound for healing. Puran and Suzanna Bair presented their sacred process yesterday at the ISSSEEM dinner involving sounds to open up the inwardly perceived dimensions of the heart. Other scientists are looking at vibrational patterns affecting water and other media. One of the first to do this was the German physicist Ernst Chladni (1756-1827), who made resonances visible using powder and sand on vibrating plates. Another was Hans Jenny in the twentieth century, who used the word "cymatics" to describe this resonance in liquids, gels and other media (Jenny 2001).

If you take water in a circular container with a small amount of dye as an indicator and vibrate it, then specific frequencies create unique resonance patterns. Alexander Lauterwasser, a photographer and cymatics researcher, demonstrated that even small changes in frequency, say from 23.7 Hertz to 24.2 Hertz to 24.24 Hertz, create totally different resonant patterns, as shown in Figure 18 (Lauterwasser 2007). So depending on the container and the frequency used to excite the water, quite different resonances can arise. In electrical engineering we express sharp electromagnetic resonances in a circuit as having a high Q. It becomes even more interesting when several tones are combined together – then new resonance patterns begin to arise. The late Dr. Peter Guy Manners in England developed this field of sound healing into a high art.

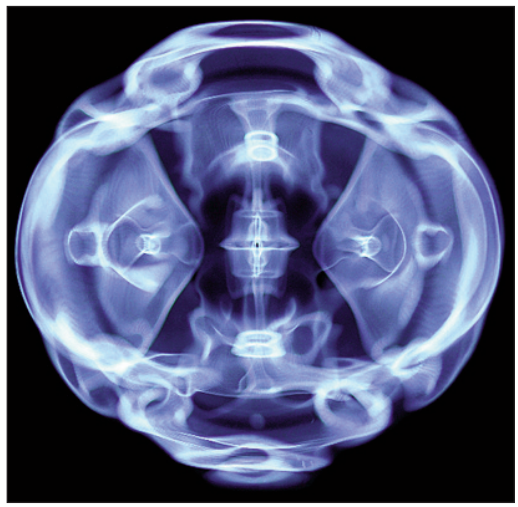


Figure 19. Water cymatic image of five tones making the heart "Om" sound (Courtesy Buchanan & Larson)

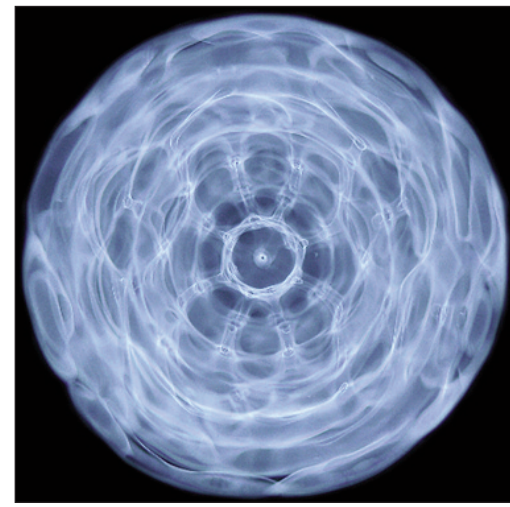


Figure 20. Water cymatic image of five tones making the heart "Penta-G" sound (Courtesy Buchanan & Larson)

To illustrate the complex frequency patterns used in this form of healing, consider Figure 19 which shows a "Heart Om," a pattern that is thought to be very healing for the heart. It consists of an experimental combination of five tones to create complex standing wave pattern in water. The notes and frequencies involve G = 384 Hertz, B = 480 Hz, C# = 544 Hz, D = 576 Hz and F = 672 Hz, all pulsed at 1.5 Hz, which called the Abrams Universal Healing Rate (UHR). Extensive research in this area has been carried out by Gary Buchanan in Nevada, collaborating with other investigators including Eric Larson, who developed the cymatic visualization equipment (Buchanan 2008). There will be actual video presentations of their cymatic work in the upcoming Heart-Mind Communications seminar. One can imagine that these kind of resonant patterns may have the power to positively affect the healing of the heart.

Another heart healing pattern from this research group is called the "Heart Penta G." It is created when the note G, which has a special resonance to the heart, is modulated by 1.5 Hertz increments. Again, this consists of an experimental combination of five tones to create the complex standing wave pattern shown in Figure 20. The specific notes and frequencies used here were G (-55 cents) = 93 Hertz, G (-27 cents) = 94.5 Hz, G = 96 Hz, G (+27 cents) = 97.5 Hz and G (+53 cents) = 99 Hz. The inherent beat frequency is 1.5 Hz, the Abrams Universal Healing Rate again. The result is this beautiful visual mandala. Perhaps these geometrical symmetries, that have always been part of the Vedic sciences, will become researched as new modalities for healing in the future.

Subtle energies also have the capacity to structure water. As already mentioned earlier, water is changed by the forms

through which it flows. These will be described shortly when I introduce specific forms called flowforms, originally developed by John Wilkes in England (Wilkes 2003). Dr. William Tiller has carried out extensive research with water and how it can be changed with mental meditative intention. He has used intention-imprinted electrical devices (IIEDs) for his pioneering work. These utilize an oscillator with a millionth of a watt power that serves as a resonator for conscious intention and is first "programmed" to cause changes in water pH and other biological assays. He and his team succeeded in altering water pH and enzyme systems purely by mental intention (Tiller 1997, 2001). Dr. Glen Rein, while working at the Institute of HeartMath, showed that DNA could be measured spectrophotometrically to show the winding and unwinding of the DNA helix by remote intention. He has used this assay to study various healers and their focused intentionality.

Earlier I described the heart as made up of various muscle layers arranged in spiraling vortex patterns. Indeed we might go a step further now and suggest that the heart is a vortex generator itself that imbues a spin to the blood traveling through it. This is analogous to the vortex or spin fields that the physicist Dr. Claude Swanson talked about in his presentation on Russian torsion field research. These ideas correlate well with the pioneering work of Victor Schauberger, the Austrian forester and water researcher, who said that water was our most precious resource. He had shown that inside

Figure 21. Hyperbolic vortex created by tangential water flow in an egg-shaped glass container

an egg shape, liquid vortices form with great ease (Schauberger 1998; Alexandersson 1982). I did some research in this direction several years ago by building a glass egg shape with water introduced tangentially to rapidly create a powerful vortex (Figure 21). It confirmed that the resulting vortex followed the shape of a hyperbolic cone. This special geometry, essentially being a hyperbola in the vortex's cross-section, creates a most efficient vortex structure as already shown by Victor Schauberger's son, Walter Schauberger (Radlberger 2005).

Many people now design and construct flowforms which allow different rhythms to be imparted to the water that flows through them. The flowform shown in Figure 22 has the shape of a three-chambered fish heart. One can literally see the pulsation imparted as the water flows through these forms. It re-energizes the water and makes it much easier for plant life to grow. The English

Figure 22. Flowform created in shape of three-chambered fish heart

inventor of these flowforms, the sculptor John Wilkes, installed many flowforms in the Dutch NMB bank headquarter designed by the late Ton Alberts of Amsterdam (Wilkes 2003). From reports of the staff there, flowforms contributed to creating a healing atmosphere in the building, including the unexpected disappearance of cardiovascular problems within the staff.

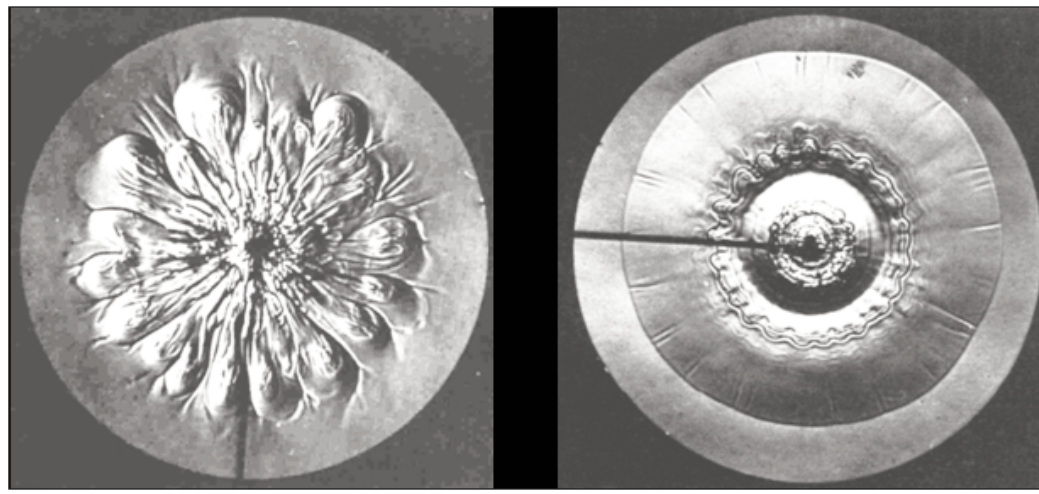
In Europe, they are also using these flow forms in industry, like the one at the Bio Sophia grain milk (Demeter brand) production facility in Lillehammer, Norway, shown in Figure 23. The impulse for these water researches came from the Anthroposophically oriented work of the German water researchers Wolfram and Theodor Schwenk (Schwenk 1989). At the Demeter production facility, they also surround the flowforms with certain geometric structures to enhance their effectiveness. As water moves through these flowforms, the subtle energies imparted to this grain milk are intensified, making it easier to assimilate.

To study these subtle changes in water, some Anthroposophical researchers use qualitative (rather than quantitative) techniques. Theodor Schwenk found that if drops of pure water were sequentially and slowly dropped into test water, little vortices would form that could be visualized through Schlieren photography. These beautiful vortex structures only occurred if the water had a natural vitality and was healthy for living organisms. If the

Figure 23. Flowforms surrounded by transparent geometries at Demeter grain milk factory

water was polluted, then these vortices would be attenuated or would not form (Figure 24). This is strictly a qualitative way of testing water to characterize its subtle energetic character. Schwenk's work is described in great detail in his books, *Sensitive Chaos* and *Water: The Element of Life* (Schwenk 1965 and 1989).

Figure 24. Qualitative water analysis by drop picture method – spring water (left) and polluted spring water (right)



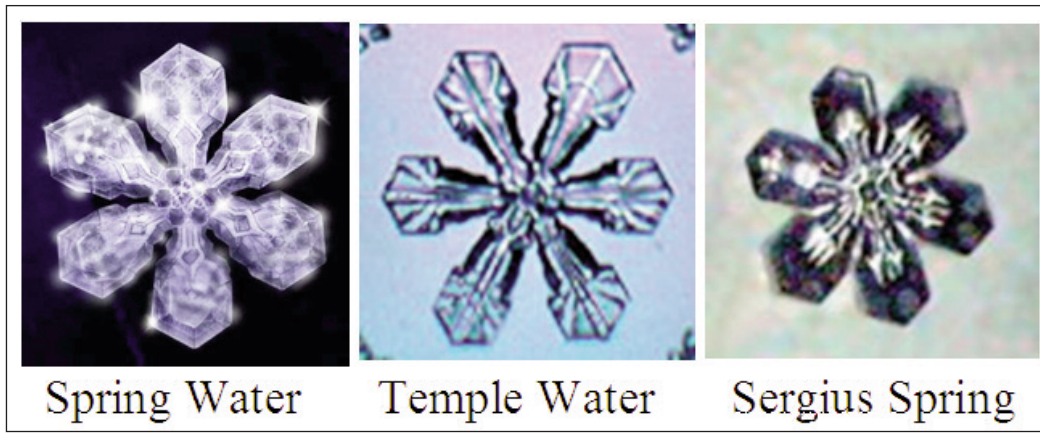


Figure 25. Water crystallization patterns from sacred places according to Izvekov

We heard in Dr. Steve Levin's talk about the importance of the 60-degree angle in his research with living systems. It reminded me of the water crystallization work being conducted in Germany by Andreas Schulz, the developer of the Hagalis Method for assessing the quality of water. They found that the predominance of 60-degree hexagonal patterns in the crystallization images is an indicator of high water quality (Schulz 2005).

In Russia, Leonid Izvekov also carried out crystallization studies. They looked at spring waters that have a lot of energy, as well as healing waters and temple waters where people pray over the water (Figure 25). They have also demonstrated through these crystallization studies that at certain seasons, like at the Easter season when the Christ impulse comes back on earth, the water totally changes. Apparently playing classical music creates this hexagonal crystallization snowflake pattern. Rock music has a more adverse effect on the water with poor crystallization images. Many people are familiar with the work of Masaru Emoto, the Japanese water crystallization researcher. He and Leonid Izvekov actually met in 2008 in Russia and are now collaborating on some research.

In the remaining time that I have today, I would like to talk about what I consider the heart of the matter. I would like to pose a question: Can we develop a new model of the aetheric, of a new understanding of the structure of the subtle realm? It is my belief that the true significance of the heart can only be known when the nature of the aetheric heart is understood. Can we know the nature of the aetheric heart that Rudolf Steiner talked so much about (Haertl 2000), the heart that is connected with our future karma? This approach to understanding the heart is connected with what we create in the future. Before describing a new possible model, it may be helpful to re-examine some of the aether theories that have been disregarded or dismissed in our current approach to physics.

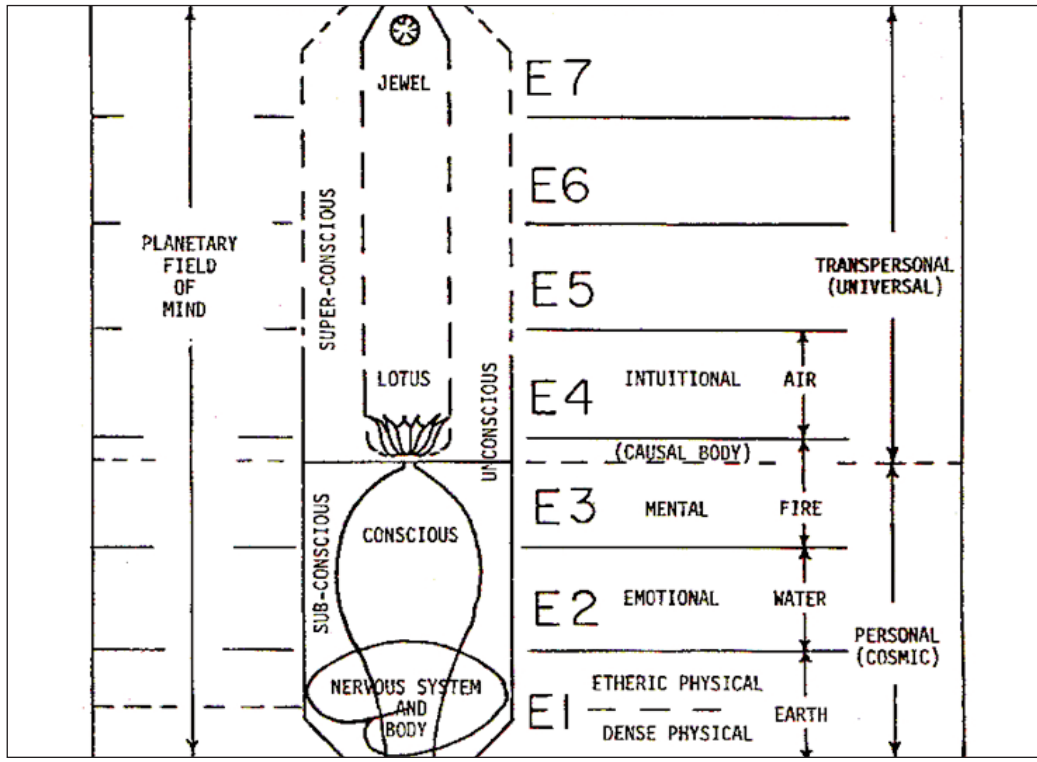


Figure 26. Elmer Green's diagram of planes of consciousness in the planetary field of mind

Many of you are familiar with Dr. Elmer Green, one of the founders of this society. He has often shown this diagram (Figure 26), which shows different planes of consciousness within the Planetary Field of Mind, as he used to call it. At the lowest level of this diagram we see the Etheric Physical above the Dense Physical. Elmer was a great student of the Tibetan D.K. (Djwal Khul), as well as having a deep appreciation of the Theosophical way of looking at the different levels of manifestation and consciousness. If we accept that the teachings of these ancient wisdom traditions hold some truth for us, then we have to find a way to build a bridge between science and spirit using modern approaches.

One hundred and four years ago in 1905, Albert Einstein introduced the principle of special relativity that led to the abolition of the luminiferous aether. This aether was originally proposed in the 17th century by Huygens, who first gave us the wave theory of light, in contrast to Newton's corpuscular way of looking at light. However, the aether concept goes back to the ancient Greek culture. To the Greek philosophers aether was not only the finest foundational essence of the world, known as pneuma or the world soul, it was also seen as the quintessence of heaven. So the aether was greatly venerated in that epoch of human evolution. It is also not well known that

in 1920, Albert Einstein called for a relativistic aether. He had been invited by his friend, the physicist Paul Ehrenfest (1880-1933), to be a special visiting professor at the University of Leiden in the Netherlands. On October 27, 1920, he accepted this appointment with an inaugural lecture on "Ether and Relativity Theory." He said,

> *Thus we may also say, I think, that the ether of the general theory of relativity arose out of the Lorentzian ether, through relativization. As to the part which the new ether is to play in the physics of the future we are not yet clear. We know that it determines the metrical relations in the space-time continuum, e.g. the configurative possibilities of solid bodies as well as the gravitational fields; but we do not know whether it has an essential share in the construction of electrical elementary particles constituting matter.*

Einstein stated that his Theory of General Relativity never got rid of the aether – it just was no longer the luminiferous, somewhat mechanical aether that had been visualized and accepted in the past.

Two-time Nobel Laureate Linus Pauling was the first person to apply quantum mechanics to chemistry. He said, "To have a good idea, you need to have many ideas." I like that quote because it hints at the evolutionary process that physics also had to go through in viewing the aether. It is instructive to look up the Wikipedia listing on the luminiferous ether. In this compilation, one can get a sense of several different aethers that were proposed over time. Einstein talked about it already in 1920 as the relativistic aether. In 1953, Louis deBroglie called it the subquantal aether. In 1970, Dudley called it the neutrino-flux aether (http://en.wikipedia.org/wiki/Luminiferous_ether).

More recently, the quantum physicist Friedwardt Winterberg (Winterberg 2002) and the German scientist Klaus Volkamer (Volkamer 2002) began to describe what they call a Planck Aether. Winterberg, who was a physics professor at the University of Nevada, was a student of the great quantum physicist Werner Heisenberg. His Planck Aether Hypothesis is based on a four-dimensional fluid mechanical ring vortex model also involving negative Planck masses. In contrast, Volkamer developed a different model involving positive and negative Planck masses in an expanded twelve-dimensional model described later.

The Planck Aether Hypothesis was developed because there are several things that are problematic with the current Zero Point energy model. According to the physicist John Archibald Wheeler (1911-2008), who developed the theory of geometrodynamics, the so-called vacuum has almost infinite energy calculated to be in the order of 10^{94} grams per cubic centimeter, but exists in a state of perfect symmetrical balance. The physicist Mark Comings has called it the quantum plenum at past ISSSEEM meetings. According to Winterberg, unfortunately there are divergences in the vacuum that lead to

infinities. Physicists abhor infinities, and constantly attempt to rid themselves of them through processes such as renormalization and other mathematical tricks. The majority of scientists talk about many types of fields coexisting in the "vacuum" and have dismissed the aether completely. Winterberg tried a fresh approach by building a new model of the aether.

A central question might be asked: Has the vacuum become the aether? Volkamer has built a model that essentially suggests a subtle energetic realm of higher dimensions by incorporating the Planck aether. He derived the quantum properties of many subatomic particles with his model. More importantly, he has years of experimental evidence on which to base his theory.

Before describing Volkamer's work, we have to understand the fundamental Planck units. There is length, mass and time that we use to define energy. Energy is defined as length squared, times mass, divided by time squared. Energy involves all three quantal units. One of the fathers of modern quantum theory was the German physicist Max Planck, who proposed in 1899 that we can simplify the equations of physics tremendously if we create certain constants or fundamental quantal units. Length was defined as Planck's constant multiplied by the gravitational constant divided by the cube of the speed of light. This Planck length is minute and immeasurable, having a value of 1.616×10^{-35} meters. It is at this level that string theorists claim to have rolled up an additional six or seven dimensions. As a result, string theory is the result of some very creative thinking by theoretical physicists; however, it can never be proven experimentally.

Planck time was defined by a similar formula as Planck length, except it uses the fifth power of the speed of light. Its value is 5.391×10^{-44} seconds. This is also a very small number. We can never measure this time – it's just too short. But it can be used in calculations to simplify the physics equations. Now we come to the third quantal unit called Planck mass that is also very small but unlike the other two, it is measurable. Its formula is Planck's constant times the speed of light divided by the gravitational constant. Its value is 21.76 micrograms; that is in units of a millionth of a gram. Scientists have developed sensitive instrumentation to measure at that level. Dr. Klaus Volkamer in Germany has been doing sequential measurements with very sensitive scales for over twenty-five years and found some unusual things. He has published his findings of these anomalous weighing experiments in the *Journal of Scientific Exploration* (Volkamer 1994). The unexplainable weight changes over time are provocative, and ultimately require a theoretical explanation, which he has offered in his books. Unfortunately, these are as yet only in German (Volkamer 2002, 2007).

When he started his investigations, he was repeating the experiments done at the turn of the twentieth century in Germany at the Kaiser Wilhelm Institute by Hans Heinrich Landolt. This work is mostly forgotten now (Landolt 1893). Landolt had shown that

there were small mass anomalies occurring in some chemical reactions. These anomalies were very small, close to the limit of detection with the weighing scales of his time. These mass anomalies were further confirmed by Sanford (Sanford 1897), Heydweiller (Heydweiller 1901) and Manley (Manley 1913).

Then there was an extensive series of experiments conducted by the Anthroposophical researcher Rudolf Hauschka (Hauschka 1950). He put seedlings into sealed containers and observed periodic weight changes when these seedlings sprouted and grew. The living sprouted seeds became sensitive indicators of the subtle realm, and responded to the influence of lunar phases detected through weight changes. Hauschka wrote a book about his experiments that began in the 1930s, which was first published in 1950 as *The Nature of Substance: Spirit and Matter.* Hauschka was aware that these weight changes were a violation of the accepted Law of Conservation of Mass, first stated by Anton Lavoisier, who unfortunately lost his head in the French revolution. With the further provocative experimental evidence of Klaus Volkamer, perhaps it is time to reconsider this law, which has locked us irrevocably into a restrictive materialistic paradigm that needs to be reexamined.

Allow me to give you a brief overview of these innovative experiments. Volkamer used a computer-linked microgram scale manufactured by Sartorius AG in Germany to conduct his sequential weighing experiments. This precision equipment, costing around one hundred thousand dollars, represents today's state of the art in weighing technology. Trained as a physical chemist, Volkamer kept weighing a small sealed Erlenmeyer flask in which a chemical reaction was initiated that led to the inner surface of the flask becoming silvered. He was repeating some of Landolt's experiments with improved modern technology. Once the silver deposition had been completed, it created a subtle energy transducer that demonstrated anomalous and unexpected weight changes. One out of many trials occurred on October 12, 1996 during a partial solar eclipse over Europe. He observed changes in the mass in the order of 15 micrograms that correlated with the moon, acting as a gravitational lens, moving over specific stars. His theoretical predictions of the moon's gravitational effect were exactly matched by the weighing measurements (Volkamer 2002, 2009). He further suggests that his experimental setup could be used to detect dark matter radiation. It was published in prestigious journals like Physics B and proceedings from dark matter symposia (Volkamer 1998, 2003).

He then developed a novel subtle matter detector in the form of a rolled sheet of aluminum foil with a polyethylene plastic insulator. In some ways, it resembles how the myelin sheath is wrapped around the nerves. It could be described as a sort of spiral capacitor, with the polyethylene insulator keeping the foil from touching. As a control, he folded an identical sheet of aluminum foil in a zigzag accordion-like manner, again with a polyethylene insulator

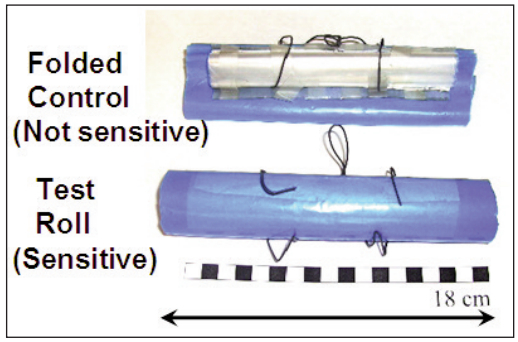


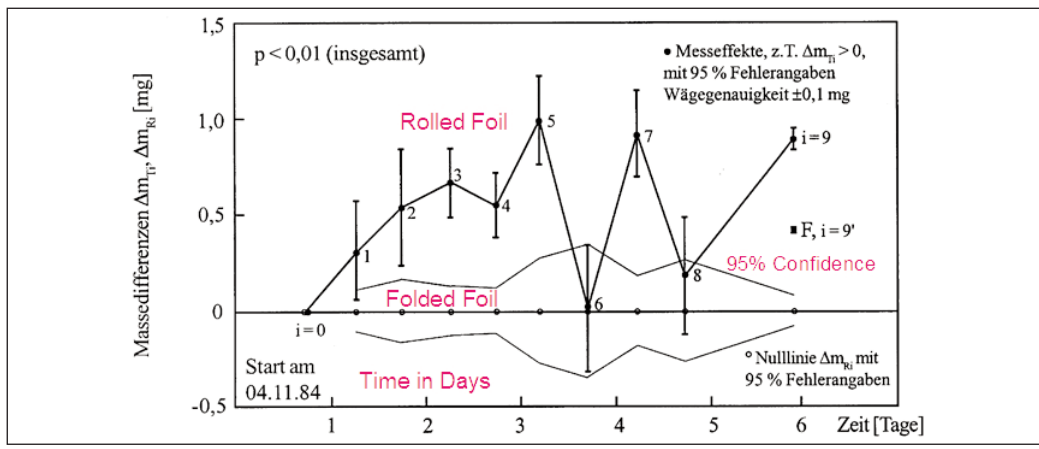
Figure 27. Subtle energy detector created by Volkamer – non-sensitive accordion-folded foil (top) and sensitive spiral-wound foil (bottom)

(Figure 27). The folded transducer demonstrated absolutely no mass changes, but the rolled transducer showed significant variability in the range of micrograms over days (Figure 28).

Then he started many weighing experiments with the new sensitive detector. In one series he had a trained healer sending energy to the transducer for 90 seconds with his hands and eyes about 20 cm away from the detector, separated by the glass casing of the scale. Before the healer started sending energy, the transducer maintained a perfectly stable weight. However, during the 90 seconds that the trained healer was asked to send energy with his hands and eyes, the weight of the detector increased by 30 micrograms (Figure 29). In comparison, non-trained healers also had effects, but they were much less effective in creating weight changes. Using their hands and eyes to send energy using the same conditions only led to a 5 microgram change over 90 seconds (Figure 30).

Another experiment was carried out to see if the trained healer with his hands behind his back could send energy to the transducer with only a focused gaze through his eyes. Now the effect was only a tenth of the earlier weight change, and initially led to a two-microgram decrease followed by a subsequent increase. Eventually the detector mass stabilized with a small increase of 3 micrograms, when the healer stopped sending energy in this manner.

Figure 28. Sequential weighing experiments with different foils (Volkamer research)



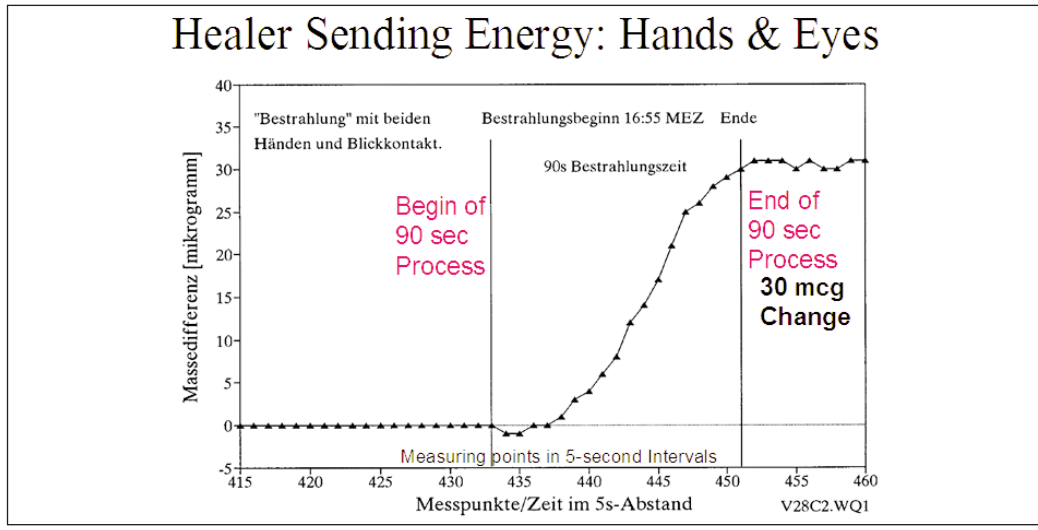
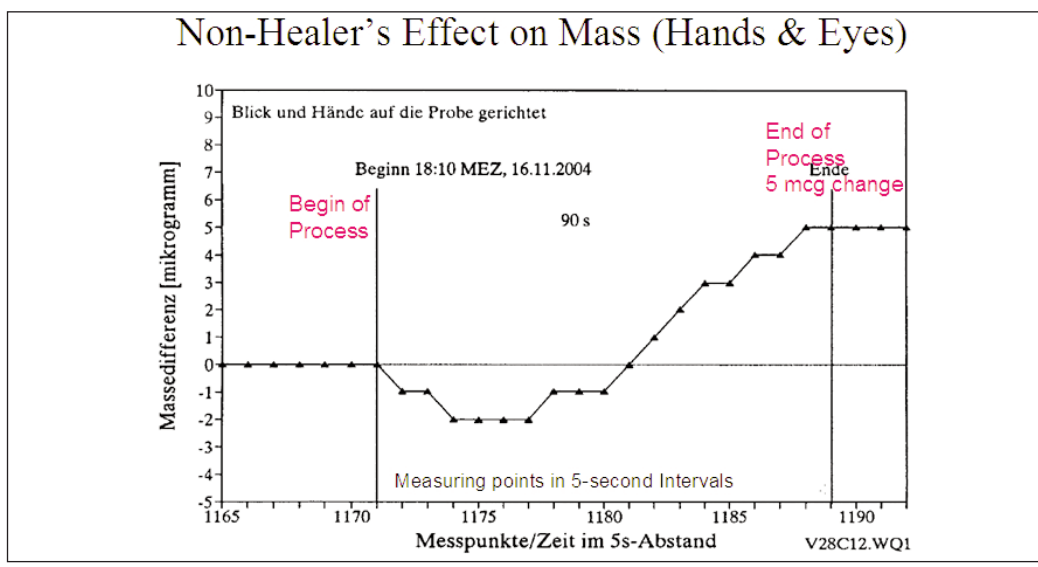


Figure 29. Weight gain in rolled foil created by healer's intention (Volkamer research)

Then the healer did an experiment without telling Volkamer, which is shown in Figure 31. After the earlier experiment of sending energy for 90 seconds had ended, the weight gain of around 30 micrograms had somewhat stabilized. After an additional minute, he moved four meters away but sent the mental intention to lower the weight increase that he had created. As can be seen, the detector's weight decreased at a slower rate and in a step-like manner to below its original mass over eight minutes and 25 seconds.

Figure 30. Weight changes in rolled foil created by non-healer's intention (Volkamer research)



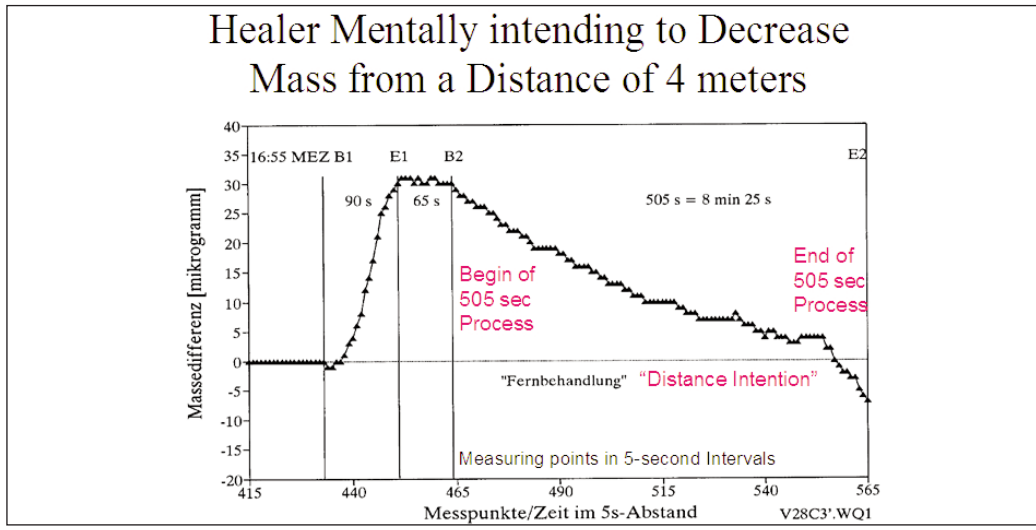


Figure 31. Weight loss in rolled foil created by healer's mental intention (Volkamer research)

These experiments demonstrate significant mass changes, ladies and gentlemen. These are not random fluctuations. Weight or mass is a fundamental quality of matter that we measure in physics. If these types of effects occurred here in Boulder at the National Bureau of Standards, they would have to explain them or at least begin to ask questions as to their cause.

Here is a final example I want to show, an experiment with a dying leaf. Volkamer had a freshly picked lilac leaf placed in a sealed, gas-tight container. After 15 hours, when the leaf died, it suddenly changed mass. There was a sudden three-microgram weight gain over the course of five minutes, and then the weight was stable again. This is shown in Figure 32. He also investigated the effect of bringing an extracted tooth near the detector. This caused the weight of the detector to decrease by around 30 micrograms over two minutes and stabilize there. When he removed the tooth from the proximity of the detector one and a half hours later, the weight returned to its previous baseline level.

Having developed a reproducible experimental method, Volkamer began to ask, what might be the cause of these anomalous mass changes taking place? He developed extensive theories based on his Vedic sciences orientation and quantum physics background and compiled a book in German which in English could be translated as *Subtle Material Expansion of the Natural Sciences* (Volkamer 2002). Our Dove Health Alliance foundation is trying to raise money to translate it into English right now, to make this material accessible to English speaking scientists.

In his books, Volkamer builds a new model of a geometrical Planck aether, correlating his findings with current models of

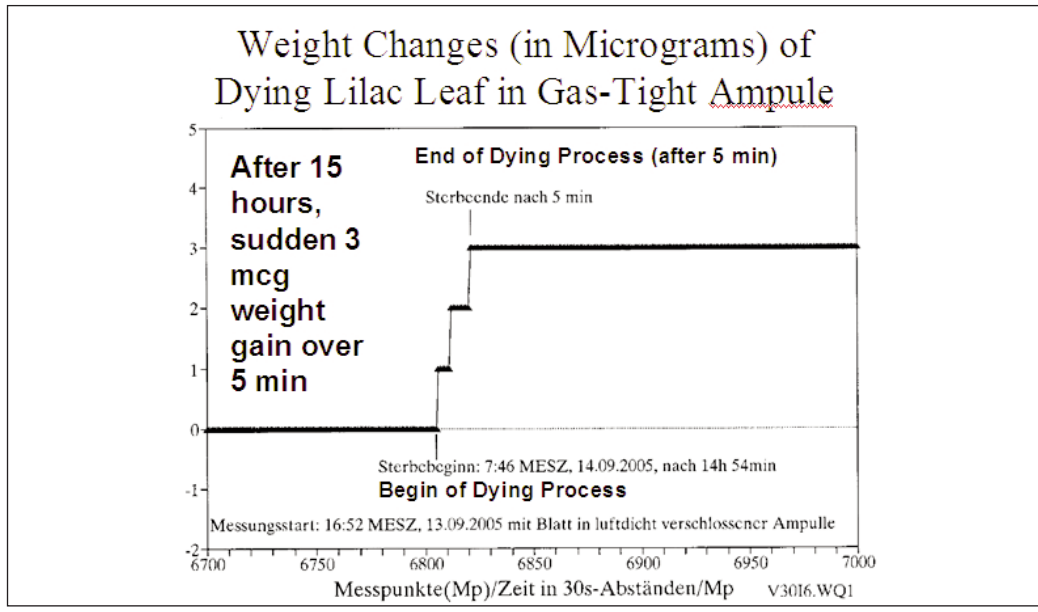


Figure 32. Weight changes in dying lilac leaf (Volkamer research)

quantum physics. He actually has succeeded in predicting many properties of subatomic particles quite accurately. Allow me to give you a brief glimpse into his theoretical model, because this may be important for our new view of the non-material aether.

I have adapted one of Volkamer's drawings comparing the current model of physics with his conception of the subtle material domain. According to current understanding in physics, the Big Bang gave rise to the four forces. Then there is this virtual vacuum, in which you have these very fast trembling motions – or *Zitterbewegung* – a term that the quantum physicist Erwin Schrödinger introduced. In 1930 he predicted these theoretical rapid motions of elementary particles – in particular, electrons that obey the Dirac equation. This came as a result of his analysis of the solutions for wave packets that give rise to a physically manifested world. In this vacuum there is also a complex flux of virtual particles coming and going – all this relating to this massive energy potential in the Dirac Sea. Eventually everything melts back together inside black holes. All this is represented on the left side of Figure 33.

What Volkamer has done on the right side of the diagram is to introduce a new subtle material realm as the structure for manifestation out of the vacuum or zero point energy domain. To clarify, Level 1 on the right corresponds to Level 2 on the left, and he leaves open the ultimate origin of the manifested universe without necessarily requiring a Big Bang origin. However, he differentiates between two different *Zitterbewegungen* – or two "trembling

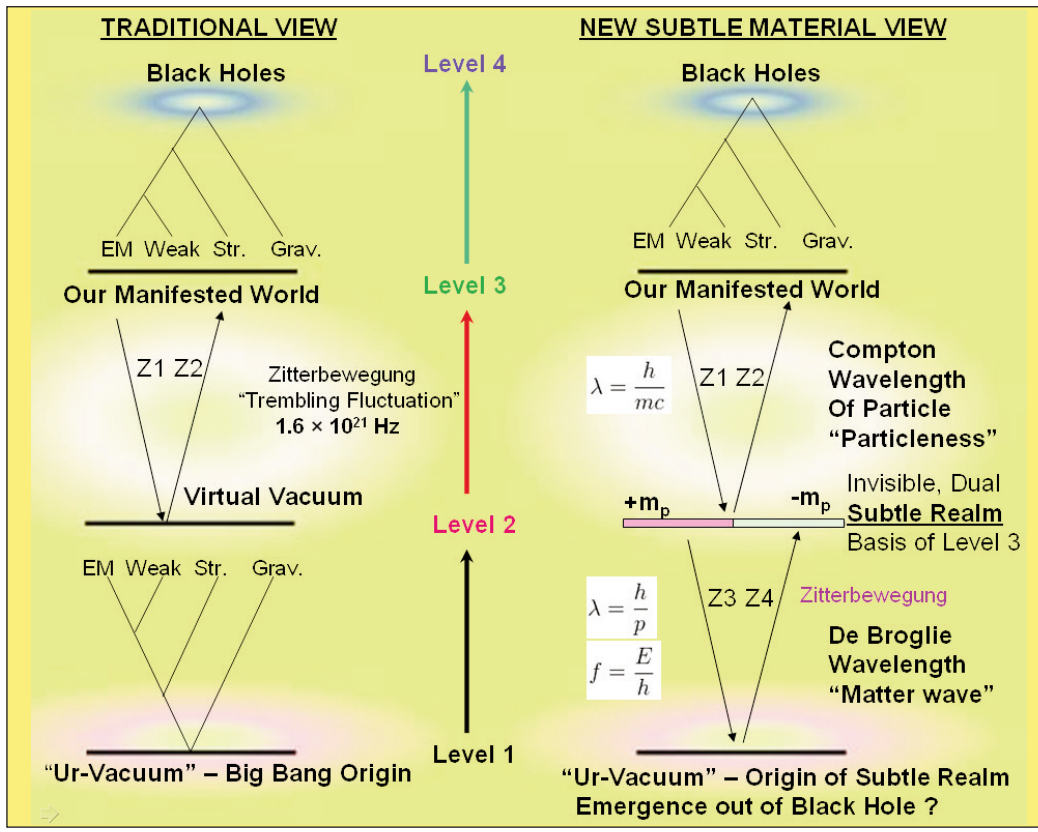


Figure 33. Alternative model of subtle material realm proposed by Volkamer (right)

motions" – that hint at the reality of the subtle realm or Planck aether. He believes that in this "Subtle Realm" (Level 2 on the right), the non-material aether has a geometrical structure with positive and negative Planck masses existing at the corners of a cubical lattice in perfect equilibrium.

As things come into manifestation out of the vacuum, the first *Zitterbewegung* (Z3 - Z4) is representative of the well-known de Broglie wave length, in essence the "matter wave" of manifestation. Analogously, the second *Zitterbewegung* (Z1 - Z2) is representative of the Compton wavelength, which defines the "particleness" of manifested existence interacting with the aether. He believes that only with a model that incorporates the subtle realm as a basis for material existence can we make progress in explaining not only many paradoxes that quantum physics has shown us, but also to make sense of the weight changes he found.

He further suggests that this Planck aether structure requires not only our accepted four-dimensional manifested world of space-time but also two other four-dimensional realms or universes that interpenetrate ours. With reference to the basic Minkowski light

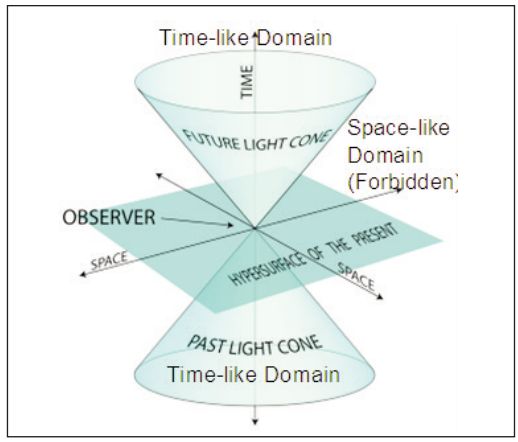


Figure 34. Minkowski light cone showing time-like and space-like domains

cone used in relativistic physics (Figure 34), it is accepted that we exist inside the light cone in what is called the vertical time-like domain. The sides outside of the shaded light cone are called the space-like domains, and these are normally forbidden to us to satisfy our relativistic physics. However, it is proposed by Volkamer that the other two four-dimensional realms that interpenetrate our universe exist here in this space-like domain. All positive as well as negative Planck masses are found in these two other space-like domains, respectively. The whole theoretical construct requires a twelve-dimensional model with the possibility of explaining dark matter (positive Planck masses) and dark energy (negative Planck masses) interacting with our universe, as tabulated in Figure 35.

His theory respects both special and general relativity, and offers new possibilities to explain the interaction of these subtle domains with our universe, which are detectable by repeatable weighing experiments. The one four-dimensional space-time domain is representative of what we have called dark energy – that which leads to the expansion of the universe (Figure 35). Simultaneously, the other four-dimensional

Figure 35. Volkamer's model of twelve-dimensional aether tabulation

Volkamer's Model of 12-Dimensional Expanded Ether

	D_{1T} Subspace Conventional 4-D Space-Time	D_{2S} Subspace Subtle 4-D S-T Parallel Universe	D_{3S} Subspace Subtle 4-D S-T Parallel Universe
Light Speed	$v < c$ Light speed limit	$u_2 > c$ Supra-luminal	$u_3 > c$ Supra-luminal
Matter	Time-like, normal material matter, antimatter and radiation	Space-like subtle Planck negative masses, antimatter and radiation	Space-like subtle Planck positive masses, antimatter and radiation
Obser-vation	Known Material Reality (4%)	Suspected Dark Energy (73%)	Suspected Dark Matter (23%)
$w =$ $i^w =$	0, +/-4, +/-8 +1	+1, -3, +5, -7… -1/i = +i	-1,+3,-5,+7… +1/i = -i

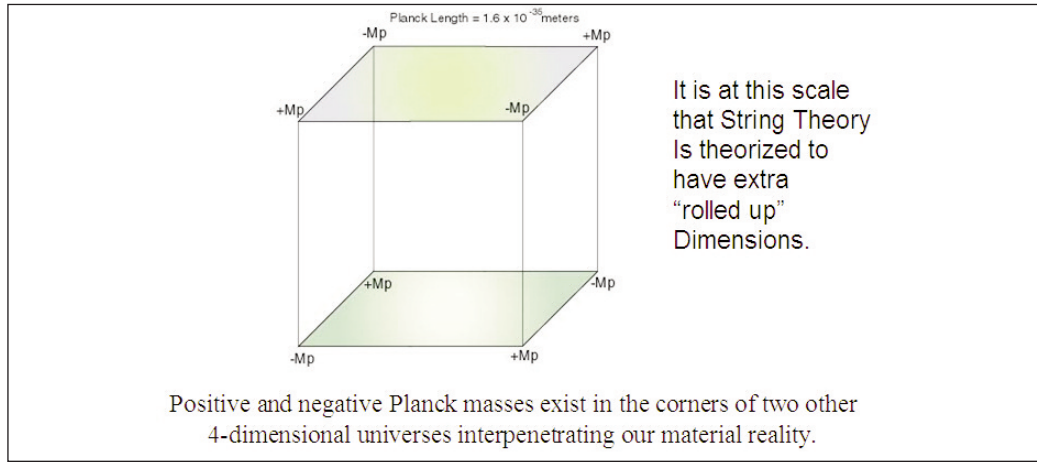
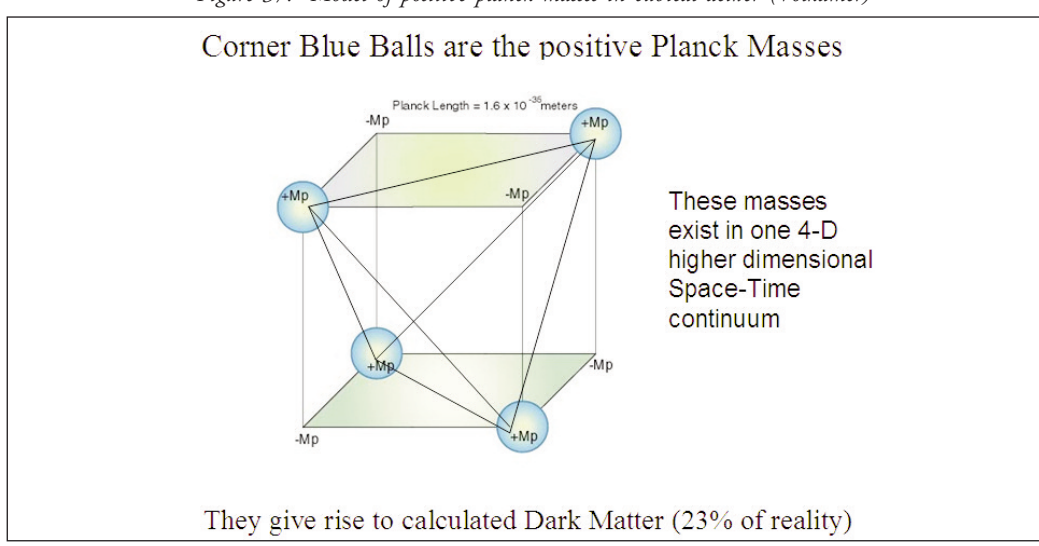


Figure 36. Proposed cubical lattice structure of aether at planck length

space-time continuum which interpenetrates ours is perceived by us through our recognition of dark matter – the positive Planck masses that lead to gravitational contraction of our universe. From our perspective, faster than light events can occur within these other two four-dimensional domains.

To recap, Volkamer suggests that three interpenetrating universes require a new twelve-dimensional model which incorporates an aether lattice consisting of positive and negative Planck masses in symmetrical balance at the level of Planck length. In terms of the smallness at this length dimension, it is analogous to string theory (Figure 36). It is suggested that positive

Figure 37. Model of positive planck masses in cubical aether (Volkamer)



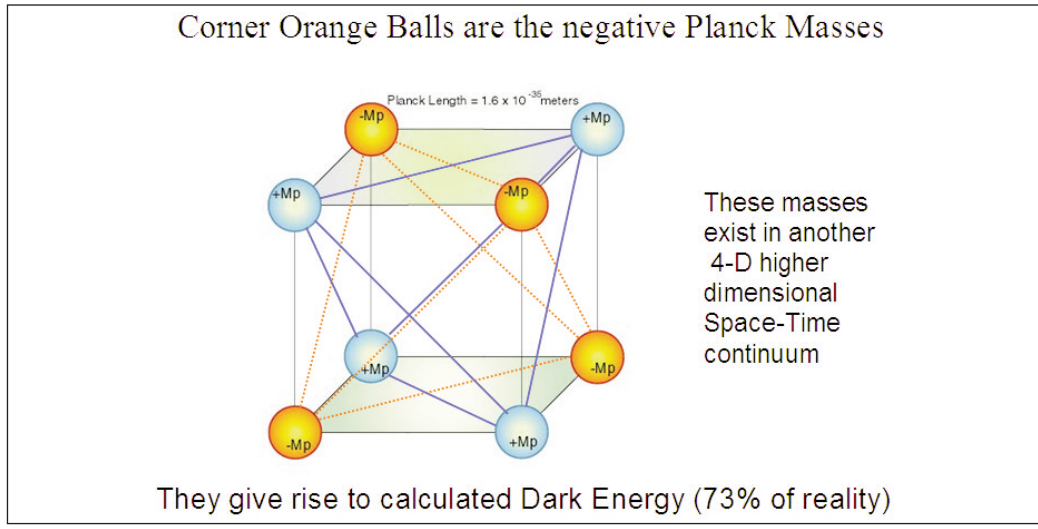


Figure 38. Model of positive and negative planck masses in cubical aether (Volkamer)

Planck masses that lead to the contraction of the universe, the constituents of dark matter or 23% of our perceived reality, are tetrahedrally arranged in this cubical aether lattice (Figure 37). Interpenetrating this cubical lattice (and again this is non-manifest – we can only get at this indirectly by measuring these weakly coupled interdimensional interactions through high precision weighing experiments) are the negative Planck masses shown at opposite corners in orange (Figure 38). These give rise to dark energy, which leads to gravitational expansion.

Finally, in Volkamer's geometrical aether lattice model, the six faces of the cube are the locations where the materially manifested particles and constituents of tangible matter of our measurable universe are found. This model of the aether lattice has to be capable of explaining our subatomic particles, protons, neutrons, electrons, photons and so forth, if it is to be seriously considered. A schematic of these face-centric positions in the lattice capable of giving rise to our manifest universe is shown in Figure 39.

A model of a photon existing in the lattice and propagating through it is shown in Figure 40. Notice each of the ¼ archetypal spins (So = ¼ h / 2 π) that interact together give the photon a unity spin with no mass. Volkamer suggests that vortex pairs in the lattice lead to mass manifestation of subatomic particles, and are indicated as thick lines in the following two diagrams. Figure 41 shows a picture of a proton and from this aether lattice geometry Volkamer has worked out the actual proton mass and spin characteristics. Similarly his model predicts other subatomic particle properties such as mesons, muons, tauons, and so forth with great accuracy. Similarly, neutrons are shown in Figure 42, where also a gluon is shown. A gluon is thought to

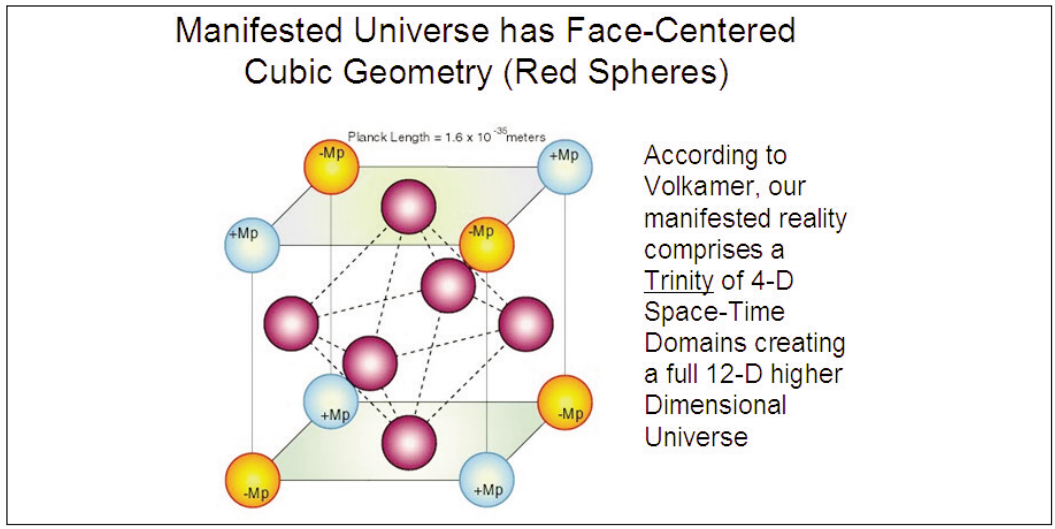


Figure 39. Model of materially manifested particles on faces of cubical aether (Volkamer)

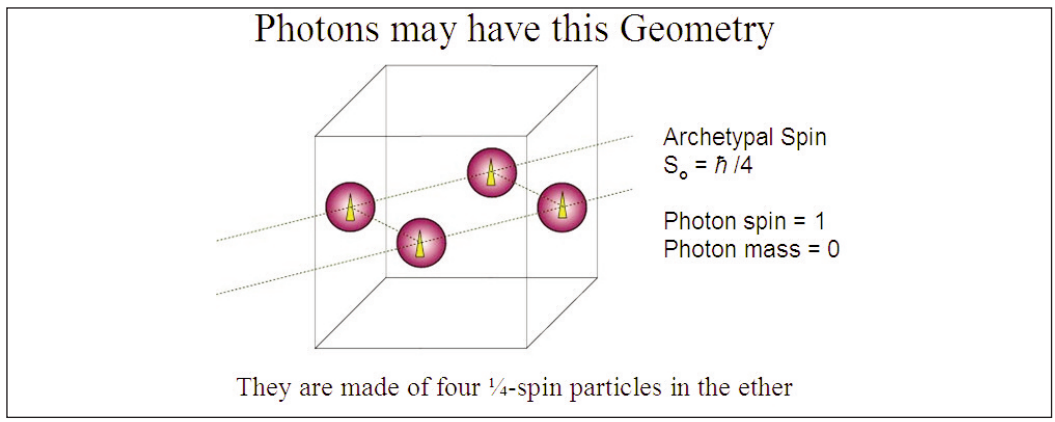


Figure 40. Model of photons in cubical aether (Volkamer)

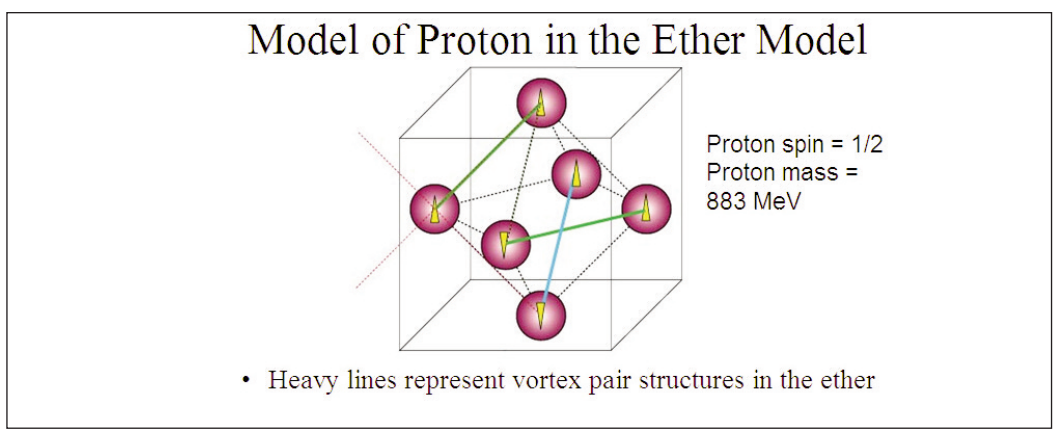


Figure 41. Model of proton in cubical aether (Volkamer)

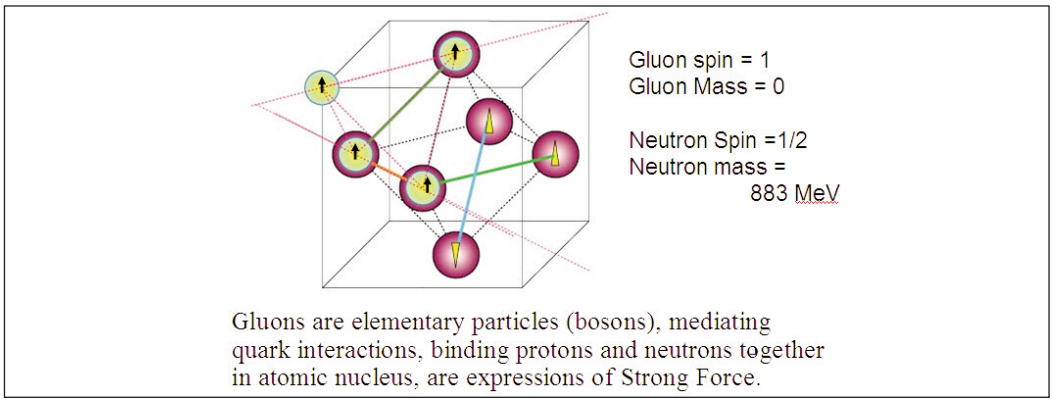
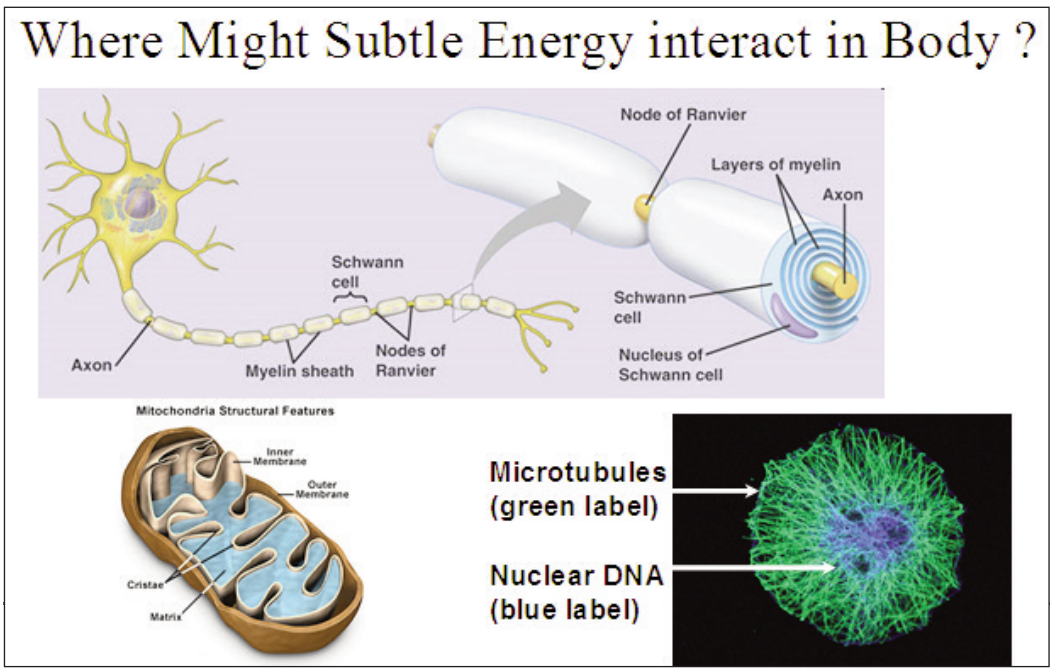


Figure 42. Model of neutron with gluon in cubical aether (Volkamer)

mediate the strong color charge interactions of quarks in the theory of quantum chromodynamics, helping to hold protons and neutrons together inside the nucleus.

Volkamer has developed a mathematical model here that should be testable. It appears to be capable of being correlated with all conventional quantum physical theories. He also asks how this subtle domain would interact with living organisms and be coupled into the cellular organelles to support life. He hypothesizes that possible sites are wherever phase boundaries occur in cells, such as in the myelin sheath that surround the nerves, inside the cristae of mitochondria, the cell's microtubules, and the DNA (Figure 43). It

Figure 43. Suggested cellular structures mediating subtle material realm (Volkamer)



is here that the subtle domain has most direct interaction with our bodies leading to vitality and life force. In essence, the subtle domains interpenetrate our bodies at all times. This is also in alignment with the Eastern teachings of the subtle bodies as well as with the teachings of the ancient wisdom traditions. If this model is correct, we may coexist simultaneously in higher dimensions with our light bodies and have access to incredible realms of consciousness. Perhaps our light bodies exist in these other eight dimensions, but they operate supraluminally there. The restriction for our physical measurements here in the material domain is that we are limited by the speed of light as our conversion factor between these other domains. Volkamer suggests that a field in these other dimensions is perceived as a particle in our dimension.

In our current physics, we are not allowed to exceed the speed of light, according to Einstein's special relativity principle. So if one desires to understand where our emotional or astral body (which means starry body), or etheric body (or subtle vital body) exists, perhaps they exist in these other dimensions that interpenetrate this manifested domain. Ultimately, they end up interacting with our brain and nervous system, with massive numbers of both myelinated and unmyelinated neurons, through a variety of quantum physical processes. The "Akashic Field" of universal memory may potentially also be found in these higher dimensional domains.

The trained meditator and Sufi practitioner Puran Bair has shown that he can actually create a heart field that is electromagnetically measurable as pure light. He has demonstrated this in a laboratory setting, where he was instrumented with photomultiplier tubes to capture the faint light emanating from his chest. Applying conscious meditative intention allowed him to increase his heart-centered light emissions by many thousand fold. (Bair 2006) Perhaps this experiment gives us some indication that we are surrounded by faster-than-light-speed fields that interpenetrate our physical body. When they interact with our materially dense matter, which is rather slow and viscous, this takes place at less than the speed of light; however, this now is measurable with our instruments.

To come full circle then, I suggest that the heart may be seen from this model as an aetheric transducer for the entire body, coordinating its action through the watery matrix, and extending outward to the planetary matrix. The heart is in constant interplay with the subtle realm. I hope we can inspire more investigators to test this model. According to ancient Yogic philosophy, the heart chakra has twelve petals, analogous to the twelve dimensions proposed by Volkamer to understand the greater reality in which we exist. His work has been inspired by the old Vedic teachings that are also the foundation of our understanding of the chakras. The anahata, or heart chakra, is the central one within the seven-chakra system. Its beautiful symbol is shown in Figure 44.

In conclusion, I hope to have inspired you to view the heart as much more than a

Figure 44. Yogic symbol of anahata – heart chakra

simple pump. It is my hypothesis that it plays a much greater role as mediator for the subtle energetic domains, and acts as a possible coherent field generator for our physical and the subtle bodies. Frontier scientists are now offering mathematical and testable descriptions of a new aether, one that is non-material, as required by modern science. However, there are mass anomalies we have to explain, including the effect of consciousness and intention. These experiments are beginning to offer us testable hypotheses. Perhaps we will find in this new century that aether disturbances give rise to long-range forces like electromagnetism and gravity. This offers us a new and expanded view of the cosmos and our place within it. We may be at the threshold of a new aetheric physics, which includes the mysterious zero point energy fields that are so widely invoked. I am sure that with time we will find the right model through open-minded, collaborative research efforts.

For myself, I sense we are at the threshold of a new era in subtle energy research. However, we might not want to call them energies, but marvel at the mysterious nature of subtle informational interactions.

In closing, allow me to invoke the simple wisdom of the Dalai Lama who stated, "This is my simple religion. There is no need for temples or complicated philosophy. Our own brain and our heart is our temple. The philosophy is kindness."

Thank you for your attention.

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This paper is based on Karl Maret's address, presented at the Nineteenth Annual ISSSEEM Conference, Sacred Synthesis: Science with Heart (June 26 – July 3, 2009).

Dr. Karl Maret is a leader with worldwide influence in the fields of subtle energies and energy medicine. He is a member of the ISSSEEM Wisdom Council, and a practitioner of complementary medicine modalities, including nutritional, functional and energy medicine. Prior to his medical studies he also trained in electrical and biomedical engineering. He is the president of the Dove Health Alliance, which is focused on promoting and creating global research and education networks in energy medicine, and, along with Lesley Carmack, he is a partner in Heart-Mind Communications, which is an education organization assisting in spiritual transformation and the promotion of health and wellness.

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