

Extraterrestrial Contact

Creating xenolinguistic sonic messages for extraterrestrial communication:
Ether Ship electronic music orchestrations in the Anza-Borrego Desert



By

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August 12, 2013

Introduction:

Since my pilgrimage to Chaco Canyon, New Mexico, on the winter solstice of 2012, a little under one year will have passed before the next pilgrimage will take place. The next pilgrimage will be to visit the Anza-Borrego desert in Southern California to witness the arrival of comet ISON. But there is more involved than just going to see a comet in the desert. This pilgrimage to the desert of Southern California is also to explore the possibility of ways in which to communicate with extraterrestrial intelligences. This will be accomplished by composing sonic messages using an array of electronic sound making equipment, electronic synthesizers, VLF radio receivers, and pre-recorded sounds from stars, animals and even the insect kingdom. The literature on extraterrestrial communication is so vast that to cite all the resources in this area would take away from explaining how I am going to approach this other-world xenolinguistic feat. In order to do that I need to outline the types of software and electronic music equipment that will be used by the Ether Ship electronic music group. However, before I outline this attempt of using xenolinguistics to communicate with extraterrestrials, I need to provide a short background on how this whole endeavor came about in the first place.

It all began standing on top of a mesa in Chaco Canyon, NM in 4 degrees above zero temperatures at 4 am in the morning on the winter solstice of 2012. It was a very dark early morning experience with clear skies full of stars and very cold. But considering the cycles of time that were taking place in the heavens, (the completion of a precessional cycle of 26,000 years) it seemed like an appropriate activity to honor this auspicious celestial event. Naturally the exact dates are controversial when one complete precessional cycle would end and the next would begin, but based on the interpretations from many of the ancient myths and the historical records of ancient calendric systems, including the Maya, Hindu and Egyptian, this winter solstice held

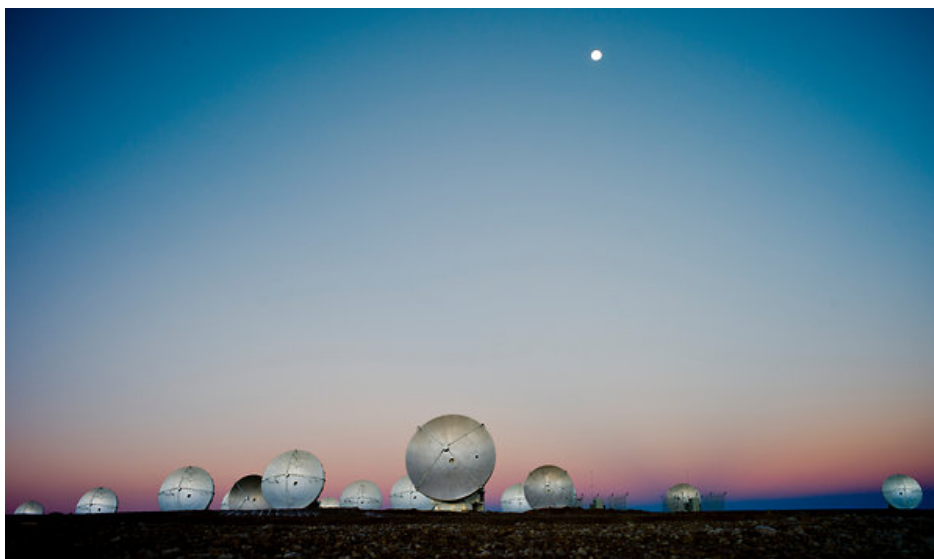
special significance for a great many people around the world (de Santillana & von Dechend, 1969). The ancient people of Chaco Canyon were Puebloans, Hopi, Navajo and perhaps even Mayan priests who conducted ceremonies in this northern outpost of Central America similar to how Vat Phu in Champassak, Southern Laos, was the northern outpost for the spiritual work of the Khmer empire based at Angkor Wat. The Hopi believe in a spirit kachina, Soyal, that comes during the winter solstice (Waters, 1963). The ceremony, Soyalangwul, is then performed ensuring the pattern of life would continue for another year. The Soyal kachina is a messenger of the solar deity providing a portal between the Hopi's world and the world of the gods. Great ceremonies were once conducted at the Kivas in Chaco Canyon as is evident by rock amphitheatres, archaeological finds of bells and Macaw feathers as well the grand architecture that mirrored the movement of the heavens (Sofar, 1997). But at the time I was standing under the night sky in Chaco Canyon it was silent and very cold. So, why would I travel from Bangkok, Thailand to New Mexico just to stand under the stars? This has been explained in another paper I wrote titled, "The winter solstice pilgrimage of 2012 to Chaco Canyon combining stellar acoustics with acoustic archaeology" (Van De Bogart, 2012).

But as I had mentioned in the Chaco paper, there were unmistakable voices, for lack of a better way to describe my experience, which I interpreted as a form of communication coming from a far vaster and more distant world than the one we are used to experiencing here on earth. It was because of feeling an encounter with an other worldly presence when in Chaco Canyon that over the past year, 2013, I have dedicated myself to researching the many attempts of other people who are also trying to make contact with intelligences not from our world.. Chaco Canyon already showed to me that this quest was not in vain. And because I experienced those voices, seemingly coming from the stars, I decided to explore an area called xenolinguistics, which has in turn lead me to writing this paper.

The idea of communicating with another intelligence existing in the universe has prompted many considerations on what technique I would devise to open a dialogue, or better still, to be in direct communication with another form of intelligence. Attempts to communicate with other species have been an ongoing endeavor within the field of interspecies communications. It was Dr. John Lily who pioneered communicating with dolphins and claimed to be guided by beings not from this world (Gorightly, 2000). Taking Dolphin communication even further SETI researcher, Laurance Doyle, used Zipf's Law to analyze dolphin whistles (Nadis, 2003). Zipf's law is mathematical formulated statistics which analyzes the frequency of occurrence of any word or utterance to determine if there is a family of sounds which could be a means to determine intelligent signal transfer. Dian Fossey, the well known anthropologist, pioneered communicating with endangered gorillas in Rwanda. The SETI Institute, pioneered by the late Dr Carl Sagan, has made an enormous effort to understand radio emissions from outer space. The list of attempts to understand the sounds made by the animal and insect kingdoms as well as the micro worlds within our DNA has been one large effort to explore how communication takes place between us, others and those who are not from our world. The new sound track, *Biophilia*, by the Icelandic artist Bjork, is a brilliant example of composing sounds that are related to all aspects of life on earth including micro worlds, plate tectonics and the vastness of the universe (Bella, 2013).

The parts to this research endeavor have included speculations about DNA being found in outer space, to research concerning a particular language gene called the FOXP2 gene and the ability of genes within our genome to be able to have an ongoing information exchange with the entire universe (Garajajev & Poponin, 2012). The technique I will use to communicate with another form of intelligence will include the use of sounds made from the phonemes of words in the human language as well as relating to the cognitive changes taking place in our brains as a result of using frequency modulations created by various electronic sound making machines (Krause 2006). Whereas Krause is researching brain oscillations in association with human cognitive processes, Dieter Broers, believes we are undergoing a complete restructuring of our neural networks as a result of high solar-geomagnetic activity (Broers, 2012). These concerns about our brain activity have prompted a new consortium of European scientists to form the Human Brain Project (HBP) developing a new field of neuroinformatics.

The domain of cognition as an epistemological framework, or working mental schema, that takes place when considering conception of a cosmological structure especially when attempting to communicate with another form of intelligence, and whether any anomalous cognition could be recognized, will be one of the main areas of focus in this Anza-Borrego pilgrimage (Lemarchand & Lomberg, 2009), (Spottiswoode, 2012). There has to be some recognizable change in our conscious framework that we can detect or some way that an extraterrestrial contact could be felt if we are to believe that there is some form of external communication taking place within our own minds. In other words it may not be enough to depend solely on instrumentation to detect signals from intelligence; we will have to use direct experience. This whole idea of using instruments to measure and monitor events in outer space compared to direct experience was addressed by the Spanish philosopher, Jesus Mosterin, in a work titled *The Human Nature* (Mosterin, 2006). In fact Mosterin was the only philosopher to visit the Atacama Large Millimeter/Submillimeter Array, known as ALMA, in the Atacama Desert in the mountains of Chile (Romero, 2012). ALMA's construction, said Jesús Mosterín, is taking place at "the only time in history that windows into the universe are being thrown wide open."



ALMA: Atacama Large Millimeter/Submillimeter Array - Chile

Mosterin's concerns on how culture determines the way we look at things was summarized in this concluding remark.

“By not distinguishing between ponderable and imponderable cultural traits, between things that can be measured and compared objectively and others that only exist subjectively through social conventions, denying the peculiarity of the game of science in general culture, we would condemn ourselves to not knowing anything”.

As far as a new working cognitive model is concerned, the principle investigator for the SETI Observational Program at the Argentine Institute for Radio Astronomy (Lemarchand & Lomborg, 2009) recommended that new *cognitive universals* might be used to develop new strategies when searching for life in the universe. They have introduced the term *cognitive map* to define more accurately the conceptualization taken from the epistemology of science known as a paradigm or worldview.

Communication is a broad term encompassing sending a signal to another life form to convey some message. Humans, along with the animal and the insect kingdoms, have developed a variety of ways to communicate with one another. The relationship between extraterrestrial intelligence and insects has prompted research in how distributed intelligence works (Wray, 2011). Insects demonstrate this distributed intelligence when they use their infrared emissions for electromagnetic communication (Callahan, 2006). However, as humans, we have expanded our communicative abilities from only being sentient beings to developing higher order functions enabling us to make tools and evolve into conscious reflective beings with the ability to record and reflect on our own cognitive activities (Haycock, 2011). In a sense, we are thinking beings that have learned, to some extent, to master our destiny. But out of the entire range of human activities, we have to understand that cognitive models are mental frameworks by which to make hypotheses on phenomenon we experience in the world that we have been born into. Any attempt to communicate with intelligence in the universe other than with our own species has already been addressed in many different ways in the literature and continues to be a subject of interest to astrobiologists in their quest to see if life exists on other worlds. Exoplanets are now being discovered by the Kepler Space Telescope which indicates that there are many candidates for life in the galaxy (Lemonick, 2013). Exolinguistics or xenolinguistics falls into the broad study of Xenology. In an exhaustive study of *Xenology* (Freitas, 2008) Freitas points out that there is a very long history concerning whether or not aliens have had a direct influence on the development of human intelligence. In another study a complete work of communicating with aliens from a psychological perspective explores the meaning of languages and the many states of mind to consider when attempting to communicate with an alien species (Judge, 2000). At the cosmological level, extraterrestrial intelligence is being looked at from an astro-biological quantum level of non-locality in the universe when events which take place somewhere in the universe are directly connected to our own space-time reality and vice versa (Thaheld, 2006). Needless to say there have been many attempts and methods in which innovative techniques were used to communicate with intelligences not from our home planet. Citing them all is beyond the scope of this paper; suffice to say they are well documented for the interested reader (Fraknoi,

2010) (Daney, 2002). Reference will be made later in this paper to one of the models Lemarchand and Lomborg mention as well as some of the current attempts by researchers around the world to communicate with another intelligent life form.

Many ideas for this paper have been taken from a wide range of studies including quantum physics, DNA research, language types from ancient cultures and even sounds from stars referred to as asteroseismology or stellar acoustics. The parts are many and the ability to devise and craft a cognitive model or mental schema by which to communicate with extraterrestrials is equally extensive in the literature. But even though this endeavor may sound like an impossible goal it will address the underlying question, which has driven all this research and crossed all these disciplines; wondering if we are alone in the universe. Keeping that in mind, it is safe to say I am in good company when I endeavor to develop a cognitive model by which to become part of a larger community of self reflective organisms other than the ones we are so familiar with from our earth-centric perspective.

Preface to Review of Literature:

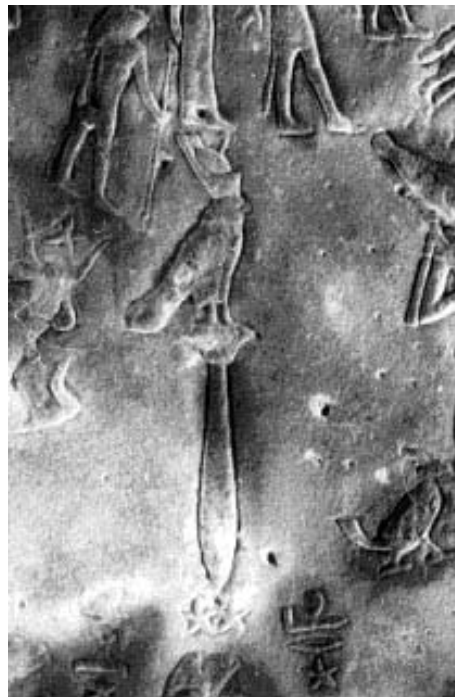
Before citing contemporary efforts to seek intelligent life in the universe, I want to start with mentioning a very old sound making artifact that has been said to be the single most important artifact in human history. In the work on the evolutionary origins of the archaeology of music (Morley, 2003) it has been discovered that an instrument was used 35,000 years ago to make a unique buzzing sound. It is called a bullroarer. It consists of a flat perforated piece of wood or bone, called a slat, with a hole at one end in order to attach a cord to then be swung in a circular motion above the head. The Aborigines of Australia have used this sound making artifact for thousands of years (Mathews, 1898) and it played a prominent part in ceremonies with people all over the world in pre-history. The one shown here was found at La Roche de Birol in the Dordogne area of France. When swung it emits a frequency between 130Hz to 174Hz. Bullroarers found in New Guinea produced frequencies between 90Hz and 125Hz. The size and shape of the bullroarer will dictate the frequency that can be heard. We could call this the first synthesizer used by humankind to communicate with the cosmos.



35,000 year old bullroarer found in Dordogone, France

How such an instrument could have been invented so long ago begs one to ask some serious questions about the need to make sound and the deeper meaning of the significance of sound in developing cosmologies. Likewise the mantras which are chanted from the ancient Vedic scriptures also go back thousands of years before there was any recorded language. A Vedic perspective of sound (Prasad, 2012) shows

how the spiritual aspect of sound guided the beliefs of the Hindu culture to maintain direct communication with the cosmos. Vedic musical cosmology (Merrick, 2012) shows the history of the ancient Sruti and the origins of OM. Merrick have also developed a Harmonic Interference Theory showing how harmonics combine to form the same geometrical patterns in both sound and the human anatomy. Merrick believes our ancient ancestors understood harmonics enabling spiritual cosmologies to develop (Merrick, 2009). This OM sound has been further studied using spectral analysis to show how the frequencies used by these ancient Hindu chants bring one to a state of supreme divine consciousness (Gurjar & Ladhake, 2009). After 25 years of exhaustive study of bullroarers, as well as carving and experimenting with their various shapes, Dr. Bethe Hagen shows how the bullroarer was used as a symbolic association with the axis of the world and the act of spinning was done as a form of creative consciousness (Hagen, 2009). One can imagine a diviner spinning the bullroarer simulating the position of our planet in relation to the stars.



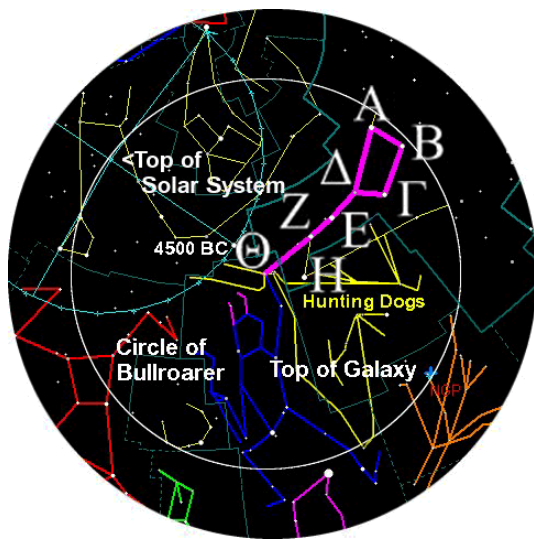
Horus standing on bullroarer on Denderah Zodiac (Section of Louvre Inv D38 Photo)

Hagen is the first scholar to indicate that Horus is in fact standing on a bullroarer on the ceiling in the Temple of Hathor in Egypt in the Denderah zodiac. Bullroarers were also found in burial tombs of the Pharaohs. All of this definitely points to something very profound in making frequencies by swinging a flat piece of wood while standing under the stars thousands of years ago.



Bullroarer found in King Tutankhamun's Tomb 1323 BCE BC

A recent study shows the relationship of the bullroarer to the fate of the human race, and the seven stars in a constellation forming the big dipper from which myth and scriptures about the bullroarer were written (Allen, 2013). Allen continues to say that the human soul has a quality within it that reaches out for a universal relationship. The bullroarer device makes the relationship real. It is unique in its ability to cross the boundary between physical and spiritual communication. Like all talisman objects the device communicates the divine mystery. But, each bullroarer has its own essence. Essence is soul. Soul is identity. Identity is "I Am." I Am is the Soul of All.



Star chart and constellation (Allen)



Bootes showing bullroarer of seven stars (Cellarius)

Bullroarer animation by Allen:

<http://returntopatmos.com/CellariusBullroarerCrossingJordanRiver.m4v>

Allen believes the Denderah zodiac on the ceiling of the Temple of Hathor was revealing the meaning of a Sacred Initiation Ritual for boys to become men. The ritual is that of the 35,000 year old use of the bullroarer to teach creativity, masculinity, paternity, and divinity.

The bullroarer device has been found everywhere around the world for 35,000 years. The theory of the cult ritual is simple. Great Tribes and Great Nations are built by men who assume the state of Divine Father on Earth. From its earliest beginnings the sound of the bullroarer has played a very important role in helping humankind develop a relationship with the stars and the eternal creator (cosmocrator), and it was no more a mystery then as it is today as radio telescopes peer into the depths of the universe and send messages to distant galaxies.

Review of Literature:

Lucianne Walkowicz, a postdoctoral student at Princeton University, has been awarded a grant to study extraterrestrial intelligence by measuring the variability in star light (Lemonick, 2012). Thanks to a program titled “New Frontiers in Astronomy and Cosmology,” and funded by the John Templeton Foundation and administered by the University of Chicago, Walkowicz will begin a study to see if star light is used as a mode of transmission for extraterrestrial intelligence. Walkowicz’s premise is that we may have detected a signal from extraterrestrials but missed it because of our preconceptions. So what she is going to do is develop software algorithms to look for unusual patterns of variability near the exoplanets detected by the Kepler Mission as well as look for all unusual variability in star light. Admittedly, it is very ambiguous work she is doing, but the need to analyze and explore possibilities that could indicate intelligence beyond the earth is supported by prestigious organizations.

Dr. Gregory L. Matloof, Professor Emeritus in the physics department of New York City College of Technology has proposed the psychokinetic option whereby he offers the explanation for anomalous stellar motion is in fact a form of psychokinesis, or that the mind of a conscious or sentient star can act on the physical properties of that star (Gilster, 2012). The reasoning offered here is that consciousness can directly influence the properties of a star by using quantum mechanical fluctuations. It is here that Matloof believes that consciousness is built into the structure of the universe. The whole idea of a conscious star seems implausible, yet using the logic of the behavior of quantum states and our integration with this state, Matloof believes we could in fact be in direct conscious relationship with the stars due to the fact that many of the quantum-physics-based theories of organic consciousness postulate that a universal consciousness field interacts with electrically conducting nanostructures within the cell of our nervous system and that consciousness, like gravitation, is built into the structure of the universe. Unfortunately Matloof does not offer how we could detect any communication from a star, but the idea that they may have sentience is part of what is compelling researchers to explore extraterrestrial communication. This entanglement concept of consciousness combined with quantum phenomena has become one of the elements in creating my own cognitive schema when trying to explore ideas for extraterrestrial communication using frequency modulations with electronic synthesizers. The aspects border on the ancient precepts of celestial prophesy and the Universal Mind, i.e., God.

Dr. Diane Reed Slattery has pioneered the language that stems from psychoactive substances and has developed the app known as the Glide Oracle. The core rationale for developing this app was to explore the relationship between language, consciousness and our perception and conception of reality (Slattery, 2012). Slattery explores the unique communicative process in altered states of consciousness and the

language that is experienced in those states. Her app explores the existence of buried states of consciousness that in fact may be a place where extraterrestrials reside. By looking at her images on her app and reading the poems accompanying the images it is her hope that a better understanding of the deep unconscious can be revealed and a newer form of aesthetic relationship can be explored.

Shelly Wright, from the Dunlap Institute for Astronomy and Astrophysics in Canada is exploring Near-infrared Optical SETI (NIROSETI) instead of using radio signals to detect extraterrestrial messages. Wright and her team believe laser pulses have the advantage that light at infrared wavelengths is less affected by interstellar gas and dust; an infrared signal can be detected at greater distances than an optical signal at shorter wavelengths (Dunlap, 2013)

Wanda Diaz-Merced, a post doctoral student at the University of Glasgow who lost her eye sight in her 20's used her hearing to continue her work by turning to the sounds of stars. Under the guidance of Gerhard Sonnert from the Harvard-Smithsonian Center for Astrophysics and by using, xSonify, a software program developed at NASA, Diaz-Merced plugged in data received from the Chandra X-Ray telescope which was picking up signals from the Ex-Hydra binary system. Then with the help of composer Volkmar Studtucker from Germany they developed, Projekt "X-Ray Hydra", and created harmonic musical melodies using x-ray emission from across the galaxy (Center for Astrophysics, 2013) (Studtucker, 2012).

The International Space Apps Challenge was an international mass collaboration focused on space exploration that took place over 48 hours from April 18 – 22, 2013 in cities around the world. The event embraced collaborative problem solving with a goal of producing relevant open-source solutions to address global needs applicable to both life on earth and life in space. NASA was the leading global collaborator along with a number of additional government collaborators and 100+ local partner organizations. In the project category I included my project on communicating with extraterrestrials <http://2013.spaceappschallenge.org/project/extraterrestrial-communication-using-synthesizer-and-stellar-acoustics>. One of the locations for the Space Apps Challenge was in Santiago, Chile which is near to where the ALMA Large Millimeter/Submillimeter Array facility is located. An ongoing collaboration is under way in Chile with Munesh Kumar Purohit, Director of the Chile Astro Vedic Research Center (Foundation) <http://cavrc1.blogspot.com/> whereby sounds from ancient India mantras are correlated with the sounds coming from specific stars.

The Lone Signal event took place in June 2013. Lone Signal is a crowd sourcing messaging endeavor to send messages to extraterrestrial intelligence and is the ideal approach to establishing a stable, cohesive and well-resourced interstellar beacon on earth. This was the first collective and continuous METI experiment in human history (Hank, 2013). Lone Signal allows anyone with internet access to compose and transmit messages to strategically selected stellar systems. Lone Signal's mathematically based hailing message contains basic information about the earth. Lone Signal's first interstellar target was Gliese 526 – also referred to as HIP 67155 and is a potentially habitable solar system. Lone Signal's primary goals are to encourage individuals to begin to think less human-centrally by inviting them to entertain the possibility of intelligent life beyond our planet in the hopes it will downplay human differences and help foster a sense of global community. The

continuous mass (Messaging to Extraterrestrial Intelligence (METI)) was done at the newly recommissioned Jamesburgh Earth Station in Carmel, California (Barthelow, 2013).



Jamesburgh Earth Station in Carmel, California.

These are just a few of the many research efforts that are currently being explored around the world in search for intelligent life in the universe. The diversity is enormous and the accompanying literature, which has been written because of these research projects, is vast and is not possible to list all in such a short paper.

Cognitive frameworks:

The next area to be explored is citing a few concepts which are useful when trying to think of a physical model which could be used to communicate with extraterrestrials. What aspects to communicating with intelligence in the universe could be considered when designing an approach to this problem? As the title of the paper indicates, the model I have chosen is creating xenolinguistic sonic messages for extraterrestrial communication. I recently had some experience in extraterrestrial communication by sending a message over a dish antenna with the launch of Lone Signal's continual, collective and cohesive messaging extraterrestrial intelligence (METI) experiment in June 2013, organized a extraterrestrial communication project with NASA's Space App Challenge in April 2013 (Van De Bogart, 2013), and even helped to develop the guidelines for a foundation in Santiago, Chile to explore life on other worlds (Munesh, 2012).

But in as much as I wanted to try and develop another avenue of exploration, I have chosen the audio frequency approach with the attendant cosmological cognitive model of quantum non-locality and a mixture of very low frequencies obtained using a VLF receiver. But before I explain this model, I would first like to examine some of the literature that directly relates to the model I am going to use. To do this I have to discuss some basic assumptions on how life evolved in the universe as well as how our own life is a part of the larger whole. The key areas involved in my schema are a. language, b. sound, c. cognition, and d. plasma fields which exist in the universe. I

will assume that these same areas of concern are part of any developed life form that communicates in the universe, no matter how rearranged in concept they may be from our own understanding of how life is organized in the universe.

To begin I will cite the physicist Dr. Steven Hawking's lecture on "Life in the Universe". Hawking says we are entering a new phase of our evolution in what he calls a "self designed evolution" in which we will be able to change and improve our DNA (Hawking, 1996). Hawking combines both the internal changes in our own biological makeup, but also sees the external accumulation of human knowledge as part of our evolutionary makeup. With this newly acquired knowledge we are now in a position to make hypotheses on: [1] how it might be possible to communicate with an intelligence outside of the understanding of our space time relationship to the universe; and [2] consider what it might look like to actually be in a communicative relationship with an other-world intelligence which also uses the forces that make up the universe, but in an entirely different manner. In the journals kept by the well known inventor, Nikola Tesla wrote:

"My first observations positively terrified me as there was present in them something mysterious, not to say supernatural, and I was alone in my laboratory at night; but at that time the idea of these disturbances being intelligently controlled signals did not yet present itself to me. Although I could not at the time decipher their meaning, it was impossible for me to think of them as having been entirely accidental. The feeling is constantly growing on me that I had been the first to hear the greeting of one planet to another. A purpose was behind these electrical signals." (Swartz, 2001)

As brief as that introduction is to a cognitive framework incorporating extraterrestrial communications, it does set the stage to look more closely at the research that I have considered using in my schema that relates to extraterrestrial contact.

Developing a Personal Cognitive Schema:

A schema is a cognitive framework that helps us organize information. The schema I have developed includes information related to communicating with an extraterrestrial intelligence with the assumption that they would have been subjected to many of the same forces we have discovered and which have allowed for the creation of life as we know it. The late Dr. Rolf Von Eckartsberg developed a schema called the cartography of consciousness (Valle & Von Eckartsberg, 1981). Von Eckartsberg believed that:

"...as we enter the space of this universal psychocosm personally, and become aware of our own dimensions of consciousness...our integration of the bands and levels of consciousness reveals a spectrum of existence... and that all levels of existence interact, and that all fields of consciousness are interpenetrating."

In a ground breaking book 'Exo-Psychology', Dr. Timothy Leary mentions neurogenetics which studies the conscious behavior of DNA-RNA (Leary, 1977). Leary regarded neurogenetics as a branch of exo-psychology by assuming that the DNA code was not restricted to planet earth, but was originated by and designed to return to extraterrestrial intelligence.

My cognitive schema was now seeded with ideas that we are destined to return to the stars in the form of some kind of sentient being that can interact with the larger universe. Once I had become aware of these ways of thinking about our place as conscious beings in the universe, I began to search for knowledge to support these ideas and expand upon them to find a way that I could become aware of what it might be like if I did in fact find a way where I could sense a direct communication with another intelligent life form in the universe.

DNA in the Universe:

One of the most fascinating theories that has been incorporated into my schema for extraterrestrial communication comes from the work of two Russian researchers, Dr. Pjotr Garajajev and Vladimir Poponin. Their work concerns DNA acting as a bio-computer in space. Matti Pitkanen is a researcher from Finland who has co-authored papers with Garajajev. Pitkanen's work is about the concept of magnetospheric consciousness. Combined, these authors' exhaustive works explain how our DNA is in direct communication with all the forces in the universe simultaneously, much like we would tune into a TV program. Our DNA has access to all the plasma channels that the EM forces travel in. To accomplish this plasma channel to be read by the DNA, a particle called a soliton is used. Briefly a soliton is an entity which is neither a particle nor a wave, much the same way as it is for quanta. The soliton carries information that is processed in the DNA and acts as a traveling window that opens into the double helix. The Russian researchers modeled the oscillations of the helix chain of Adenine (A), Cytosine (C), Guanine (G), and Thymine (T) producing a complex pattern of oscillations from the DNA chain that are translatable into wave domains of audio frequencies. Pitkanen, in his very elaborate treatise explains how this activity of frequency modulations in the DNA chain is a form of intergalactic consciousness and that it would be directly connected to any intelligence in the universe (Pitkanen, 2012). And since the soliton entity behaves like quanta, it is part of the theorization of quantum entanglement which demonstrates the interconnectedness of the universe using non-local behavior and super luminal communication (Thaheld, 2006).

As a consequence of the human genetic code being inextricably woven into the fabric of the universe, as explained by Garajajev, it was included in my schema. Subsequently, the next element that became part of my schema to communicate with extraterrestrials was trying to understand the structure and origins of language. New research about a language gene, the FOXP2 gene, triggered the thought that in some way frequencies which exist in the plasma fields of space were somehow able to encode themselves into the building blocks of the amino acids comprising the human genome (Marcus & Fisher, 2003). In a very specific study on a group of genes called the Fox group of genes, when disrupted in their transcription process (binding with other genes) altered the ultrasonic vocalizations accompanying the transcription process. It was found that the vocal learning of songs by finches, canaries and other expressive patterns of song birds would become unstable. Given the fact that the FOXP2 gene pattern is similar for birds and humans these disrupted gene patterns

could affect how other species communicate with one another (Shu, 2012). Certainly I am not knowledgeable enough to analyze all the intricacies of genetic manipulations responsible for human language, but it did give me the idea of frequencies traveling along the building blocks of amino acids creating language genes. And with a recent study indicating that the building blocks of life exist within the icy interiors of comets causing organic compounds delivered to earth acting as prebiotic precursors to DNA and RNA base pairs, my curiosity became even more intense (Goldman & Tamblyn, 2013).

The structural dynamics of a genetic code mirroring the structure of galaxies has been discussed by a team of researchers at the University of California, San Diego. They show that the causal network representing the large-scale structure of space-time in our accelerating universe is a power-law graph with strong clustering, similar to many complex networks such as our own biological networks of the brain (Krioukov et al, 2012). This idea that the brain and the universe are much the same in their complex organization lead me to further assume that we are in fact one and this thought was included in my schema.

Music from DNA:

The next research to be added to my schema, and the one I am directly involved with currently, is how music is made by using the sequencing of the amino acids in the human genome as well as how the sounds of stars can be incorporated into a musical notation system. First, researchers of molecular genetics have successfully converted genome-encoded proteins, coming from the information already encoded in the DNA sequences, into musical notes revealing auditory patterns while still remaining faithful to the protein sequence (Takahashi & Miller, 2007). In the project called Gene2Music Takahashi takes each amino acid and then encodes them by one to six codons (each codon is composed of 3 nucleotides). Every organism has a unique codon distribution that displays how frequently a given codon is used to specify a particular amino acid. The amazing discovery is that the sequence of the proteins follows a harmonic ratio which is the main component in all musical compositions.

In addition to Takahashi's research there is also a Human Genome Music Project headed by Dr. Deamer from the Chemistry and Biochemistry department at the University of California, Santa Cruz (Deamer, 2008). Deamer has had a life-long interest in the relations between art and science, and was among the first to recognize that musical patterns could be translated from base sequences in DNA. Therefore, by knowing that DNA had patterns that were harmonically based in how they were arranged, I developed an additional idea that frequencies that could be heard by the human ear were in fact originally orchestrated from the way in which our own genetic structure was developed in the depths of space; ultimately leading to the development of our own DNA. This idea was important because when I would set the controls on my electronic synthesizers, I was aware of making a phase relationship between two oscillators as well as being aware of the tonal arrangement of the sounds using specific scales and these tones could in fact be influenced by my own genetic structure producing a state of mind that may have elements of another intelligence besides my own.

Music from Stars:

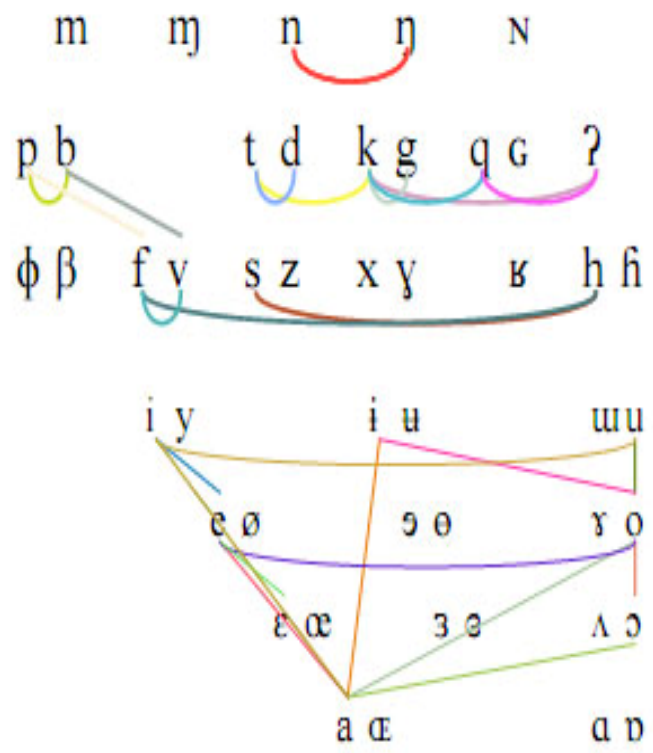
The next idea which was incorporated into my schema came from seeing how the variable light coming from stars could be translated into sound and then used in a musical notation system. The area of study is called stellar acoustics or asteroseismology. What this means is that a variable star, is a star which shows light variations due to the internal acoustic waves coming from the stars' interior (Simonsen, 2010). What is interesting is that there are mathematical parallels between stellar behavior and musical instruments. Acoustic models of these variable stars show unusual patterns with overtones allowing composers to create new musical structures. The stars' oscillation frequencies are then transposed into the audible range of humans. (Kollath & Keuler, 2006) The most comprehensive study to investigate how outer space can be sonically imagined in the last century was presented in Berlin in November 2012 at a conference titled, "The Future in the Stars: European Astroculture and Extraterrestrial Life in the Twentieth Century". This was a workshop on the historical evolution of sounds in space, their roots in social, economic and political change as well as their place within the history of music (Geppert, 2013). It was at this point I downloaded many of the sounds from stars from the network of radio dish antennas around the world to use as input for my schema in attempting to communicate with extraterrestrials. My reasoning to incorporate stellar acoustics into my attempts to communicate with extraterrestrials was on account of the stars are constantly sending out these acoustic pressure waves from deep within their interiors and permeating all of space impinging on all matter including the amino acids which are the building blocks of life. The transposition of the stars' pressure waves into the audible frequency range was in fact related to our own genetic make up. Therefore, by using the sounds made from stars a relationship exists between the frequencies in my own genetic makeup and the frequencies I was creating on the electronic synthesizer.

My schema now had another element that would be part of my attempt when trying to communicate with extraterrestrials. Adding to this field of asteroseismology is the creation of The Stellar Observations Network Group (SONG), which is an initiative to design and build a global network of small telescopes. The goal of SONG is to become a key facility in both asteroseismology and planet search research programmes. SONG has constructed eight nodes: four in the northern hemisphere and four in the southern hemisphere. This effort shows the seriousness to discover extra-solar planetary systems (Creevey et al, 2010). In addition to SONG, there is, ASTRON, part of the Netherlands Organization for Scientific Research, which is searching for extraterrestrial intelligence using the LOFAR telescope. LOFAR (the Low Frequency Array) is a new telescope consisting 25,000 small antennas to receive signals from space by using the low-frequency radio spectrum. LOFAR will attempt to detect low frequency radio signals from other intelligent beings thus being able to provide composers with new acoustic material to integrate into their compositions (Univ. Southampton, 2011). For my compositions I will be using the Interactive NASA Space Physics Ionosphere Radio Experiments (INSPIRE) VLF-3 radio receiver which can receive radio waves in the 0-10KHz frequency range that is audible to the human ear (Inspire, 2013).

Sounds of Language:

One of the most important parts of my schema that I needed in order to complete my cognitive map was language. In order to communicate with extraterrestrials I would need to create a language that intelligences not from this world could recognize or be

aware of. Having briefly cited research on several ways to communicate with extraterrestrials, I then posed a question as to what I could do that would give me some insight into developing a xenolinguistic message. How could I explore language in a constructive way that could have a relationship to intelligence not from our world? Fortunately language research is quite developed and I was able to find a detailed analysis of words that appeared in early protolanguages from which modern words evolved (Bouchard-Cote et al, 2012). My objective was to see how far back in time I could go where the origins of language creation took place or even to a pre-language state where non verbal expressions and sounds were the only way our ancient ancestors could have communicated between one another. In order to develop this idea for a xenolinguistic approach to communicating with extraterrestrials Bouchard-Cote's research effort on the reconstruction of ancient languages, using probabilistic models of the sound change in words had a direct application for use with my voice synthesizer. For linguists, the difficulty is in trying to reconstruct what words appeared in protolanguages and then how they evolved into the words we use today. According to Bouchard-Cote, protolanguages are normally reconstructed using comparative methods and that just takes a great deal of time to transcribe. Bouchard-Cote used probabilistic models of sound change as well as computer algorithms for performing inference in these models. By analyzing over 637 Austronesian languages, it was possible to see which sounds in a language are likely to change over time. The first phoneme of a word became the reference point and all subsequent variations of phonemes for the modern word were compared with its ancestral word. Below is a chart showing what this looks like when graphically represented.



Phonetic chart showing sound changes of words over time

The value for me in seeing this research was to understand how cultural evolution was a primary factor *determining* linguistic structure. The reasoning here is that ancient languages have maintained a continuity to the languages of today with their phonemes and will do so for future languages. Therefore, I reasoned that languages in their developing stages, when amino acids were being assembled in space to make DNA, contained phoneme gene structures in their matrix. The amino acids which organized into proteins were influenced by the frequencies emanating from stars, quasars, pulsars and all the EM fields within the dark plasma streams comprising over 90% of the universe. In a sense when we talk we are in actuality using the same variations of frequencies that already exist throughout the universe. We are in fact talking bituquens or stars. (refer to table 1. for the reconstruction of the word star)

Table 1. Sample of reconstructions produced by the system

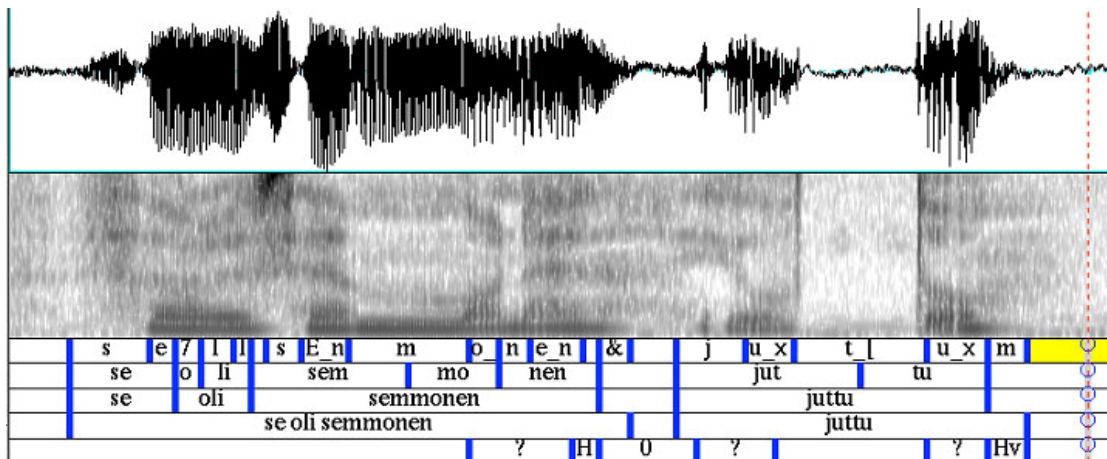
Gloss [†]	Known Modern Languages				Reconstructed Ancestors*		Δ [‡]
	Fijian	Pazeh	Melanau	Inabaknon	Manual	Automated	
star	kalokalo [§]	mintol	biten	bitu'on	*bituqen	*bituqen	0
to hold	taura	ma:raʔ	magem	kumkom	*gemgem	*gemgem	0
house	vale	xumaʔ	lebuʔ	ruma	*rumaq	*rumaq	0
bird	manumanu	aiaa	manuk	manok	*qayam	*qayam	0
to cut, hack	tata	ta:tatak	tutek	hadhad	*taraq	*taraq	0
at	e	-*	gaʔ	-	*i	*i	0
what?	cava	?axai	uaʔ inew	ay	*nanu	*anu	1
this	oqo	?imini	itew	yayto	*ini	*ani	1
wind	cagi	varə	paʔay	baryo	*bali	*beliu	2

Bouchard-Cote reconstruction table of ancient language

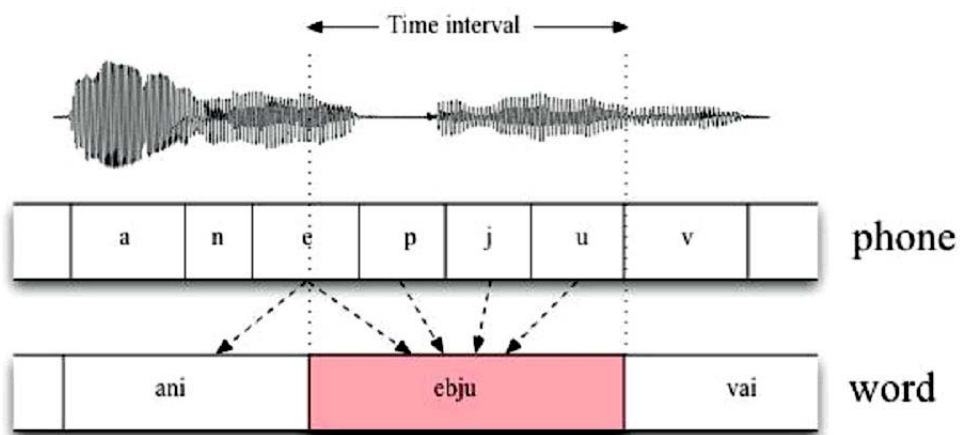
So how important is it to reconstruct ancient languages? According to Nikolaus Himmelmann it is very important. Himmelmann recently co-chaired the Documentation of Endangered Languages (DobeS) conference on language documentation in Hanover, Germany (Szollosi-Brenig, 2013). DobeS is an acronym for “Documentation of Endangered Languages”. According to the finding from this conference, over 6,500 languages will be wiped out by the end of the 21st century due to globalization and urbanization. Ethnic minorities, by losing their language, will have no access to their traditions and knowledge. Teams are going around the world to document minority languages and storing them in The Language Archive (TLA) in the Dutch city of Nijmegen, a unit of the Max Planck Institute for Psycholinguistics.

If languages are lost, the historical origins of who we are as humans will also be lost and there will be no way to listen to the sounds or understand the knowledge passed down through millennia. When I read these findings presented at the DobeS conference and combined that information with Bouchard-Cote’s research, I realized that we could end up as a species with no record of where we came from unless we could trace our roots with the sounds made by our languages. Attempting to develop a language to communicate with extraterrestrials seemed less important until I realized that without the knowledge of these initial utterances by our ancient ancestors and a way to understand the ancient tongues, we would lose a direct connection to the formative elements that originally created languages, and in turn cultures, worldwide. Moreover, a close link to the energy in the universe which formed these ancient languages would also be lost.

The concerns raised in both these research projects led me to a software program, Praat, where I could explore the sounds of vowels in real time. Praat (the Dutch word for "talk") is a free scientific computer software package for the analysis of speech in phonetics. With the Praat software I was able to analyze my own speech patterns in real time. The value in this was I could record my voice using the phonemes of various ancient words and see the frequencies made by pronouncing those words.



Praat window showing the frequency distribution for a spoken word. (Lennes, 2005)



Praat window showing a time interval for a spoken word. (Lennes, 2005)

Not only did I have a way to analyze the frequency of words by using Praat, but with a newly designed voice synthesizer, available from the Apple App Store, I was also

able to change many parameters of my speech and create many different modulations of a single word or even from a group of sounds such as in mantras and chants.



Voice Synthesizer on Apple App Store

My schema for communicating with extraterrestrials was beginning to reach a point whereby I could combine these speech elements in real time with the use of software and electronic synthesizers as well as other electronic musical instruments. However, there was one ancient language element I wanted to include in my schema and that was the ancient mantras which exist in the Vedic Scriptures. To do this I need to briefly describe the relation between space and sound and their subtle nature in reference to senses of perception (Prasad, 2012).

Earlier in the paper I had mentioned the divine nature of the Indian mantra explained by Gurjar and Ladhake. They mentioned a chanting meditation which means keeping a non-moving mind and perceiving the sound of your own OM. When you can

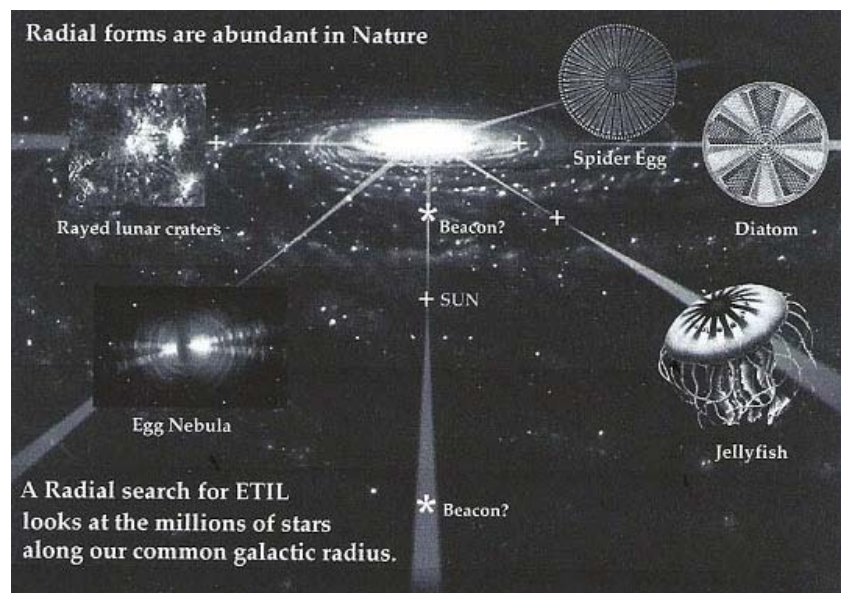
perceive your own voice then the sound and you become integrated with the whole universe. In the Vedic scriptures the fifth element is termed Akasa (ether or space) and it cannot be qualified by the four qualities of touch, form, taste and smell. Akasa (ether) can only be qualified by sound. However, sound is an additional characteristic to qualify all of the other four elements of air, fire, water and earth. Sound is the vibration which travels throughout everything in the universe affecting the structure and characterizing the elements in which it comes into contact with. This is what is said in the Vedic scripture Narayanopanisat in the Atharva Veda.

I mention this because in trying to communicate with extraterrestrials, it follows that they too have been characterized by the quality of sound based on the beliefs of the ancient Hindus. And before language even became a part of the ancient Hindu culture, a form of non verbal communication was said to have developed for thousands of years composed solely by listening to the sounds coming from the universe. It was those primordial sounds which were chanted for thousands of years and mimicked by ancient sound instruments such as the ancient bullroarer. From the low frequency buzz of the bullroarer to the ancients chanting of OM, the first sounds were harmonically related to creation and were more than likely closely related to the union of man and the universe that our ancient ancestors understood and eventually developed into a language. For Hindus a sound-space relationship has a relationship both external to the body as well as becoming part of the interior of the body. The cavity of musical instruments is responsible for the tone emitted and the cavity of the human is likewise resonating with the sound of the universe. The inner physiological implications deal with Nadayoga and it's from the inner sound we gain access to speech, chants and music (Prasad, 2012).

Implementation of Schema for extraterrestrial communication:

The above mentioned brief overview are part of my schema including some background information on how to look at the research taking place throughout the world but not organized so as to provide a working methodology which would integrate the research. In that sense the various research efforts are much like an artist's palette whereby I have to draw on the research that's related to any composition that I would want to perform for an audience that I could not see and in fact may not even exist. But it's the idea of communicating with our galactic counterparts that has allowed me to understand what so many others are doing in trying to communicate with extraterrestrials (Foust, 2010), (Daney, 2002). The time has arrived to create sounds that will come from a human voice and electronic instruments. The sound of my voice will be processed using a voice synthesizer while incorporating the idea of speech spoken for many generations, which has at its very root a resonance with the universe. The schema I am using is of course a subjective quality influencing the musical composition to communicate to a larger framework in space and at the same time applying thoughts on how vowel creation has a direct relationship to many of the geometries and organizing principles we find in nature and throughout the universe (Bovenkamp, 2010). The confirmation of their being a direct relationship between our consciousness and phenomena taking place in the universe has been verified by the cognitive scientist, James Spottiswoode, who has attributed anomalous cognition, (conscious insights that cannot be explained) to energy being released from the center of the galaxy and even geomagnetic fields leading toward a new model of anomalous mental phenomenon (Spottiswoode, 2012)).

It's at this point in the paper that all the elements of my schema have been itemized. The voices heard on that cold December 21, 2012 in Chaco Canyon was my anomalous cognitive experience which has brought me to this point of preparing a journey to Anza-Borrego. It's now time to cognize a universal cognitive map for when I use the instruments in my composition to explore communicating with extraterrestrials. The pattern I will choose is a radial symmetry pattern demonstrated by Guillermo Lemarchand from the Argentine Institute for Radio astronomy as shown below (Lemarchand, 2012). Lemarchand believes that because radial symmetry is based on a radii emanating from a common center and because it is even found in random processes of nature and is one of the major design motifs used in art as an aesthetic motif, then according to his reasoning any transmission from another intelligence may likely follow a similar design strategy when trying to either receive or transmit a message. The Tibetan mandala patterns are in fact used for centering the mind to reach a higher level of consciousness. Other symmetries are also mentioned such as bilateral symmetry as shown in the double helix of DNA and phi which is found in mathematics creating ratios in successive iterations producing the Fibonacci series. Therefore, a schema that uses a mandala like image as a cognized pattern is a way to orient cognition using a universal design principle. Throughout the ages designing schema to represent our place in the cosmos has been documented in a collection of images called, The Visual Chronology of Cosmologies (Ptak, Oct. 2010)



Universal Cognitive Map showing radial symmetry by Lemarchand and Lomborg

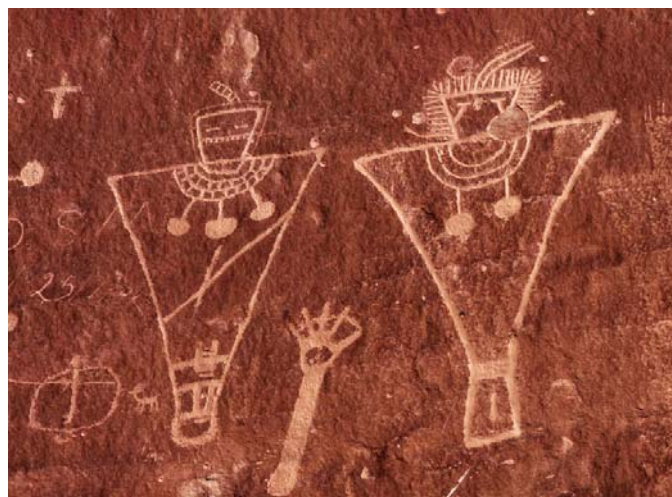
With this radial sensed pattern in mind I will then subjectively scan a large spatial domain as well as physically be able to look out into the heavens in a 360 degree circle when creating interstellar sounds. Employing a VLF receiver is going to be a way to integrate radio frequencies existing in space. Any thoughts or anomalous cognition that would be formed in my mind by using my cognitive map during the musical performance would be considered a form of extraterrestrial communication which I would in turn then use a group of phonemes from words that would come to mind and mix them into the sounds of the electronic instruments. Included in the mixing of phonemes will also be pre-recorded sounds of stars placed at intervals in

the composition including the tones and rhythms coming from Ishala, Indian music software, which incorporates many different ragas produced by the tabla and a 5 or 6 string tanpura. These compositional elements would also give me the opportunity to see what thoughts I could entertain at any one given moment during the sound orchestration. Sounds would also be coming from equipment designed by Michael “Lemon” DeGeorge, a sound engineer and long time member of the Ether Ship, who has recorded many different Tibetan chants, animals, and indigenous sounds from the people of Tuva who are famous for their throat singing. DeGeorge’s interaction with the rest of the sounds constitutes a musical collaborative effort to communicate with extraterrestrials.

Conclusion:

This Anza-Borrego sonic message composition would be a collaborative musical effort but the intent would be to experience any anomalous cognitive activity which could in fact be a way an extraterrestrial would make contact.

The night sky in and around Anza-Borrego is very dark with little if any scatter light coming from nearby cities. In fact Anza- Borrego has been designated a “Dark Sky Community” by the International Dark-Sky Association, a Tucson-based nonprofit group. The area is also very desolate with little if any traffic or noise from other equipment. The Native Americans of the Anza-Borrego mountains and deserts included the Cahuilla, Cupeño, and Kumeyaay (Diegueño) Indian tribes. It was the homeland of these peoples for thousands of years, and their artists created petroglyph and pictogram rock art expressing their cultures (Knaak, 1987). The tribes have left the Anza-Borrego area but their art still survives. And much like the petroglyphs of Chaco Canyon there are many similarities.



Anza-Borrego petroglyph

Going to Anza-Borrego is going to be a journey to the stars and the intent is to create a musical composition breaking conventional boundaries and exploring unknown possibilities. The intention at its most extreme form of expression would be to have a dialogue with extraterrestrials; if only we could decipher their message. At minimum

it will be an effort to explore sounds created in a desert setting using electronic music equipment and experimenting with innovative acoustic expressions.

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