

PART ONE: A MULTIDIMENSIONAL MODEL OF THE DREAMING STATE OF CONSCIOUSNESS

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ABSTRACT

Dreaming has been well studied by psychologists, anthropologists and neurophysiologists. Yet few models to date have really attempted to explain the spatial domain, temporal zone and energetic substances of the dream state. Space, time and energy are all important concepts studied in physics. This paper presents a useful model by implementing some pertinent ideas from theoretical physics and mathematics to explain how the waking and dreaming states can be directly experienced through multiple dimensions of both space and time. Furthermore, these dimensions are accessed almost effortlessly simply by shifting into other states of consciousness that closely resemble waking and dreaming. Such states include hypnagogic, hypnopompic, reverie and day-dreaming. Although the realm of each of these discrete states has a distinct uniqueness, experiencing perceptual imagery is what all of these states share in common. In this multidimensional model, sensation and imagination represent two vital abilities of perception.

KEYWORDS: Perception, Imagination, Imaginary Generators, Dimension, Spatial Domain, Temporal Zone, Anti-matter

INTRODUCTION

Dreams often seem bizarre and illogical.^{1,2} Yet they have inspired poets, musicians, painters, innovators and inventors. Most people have been conditioned at an early age to forget their dreams shortly after waking up. When young children wake up after dreams during the night and tell their parents, they are typically told to go back to bed-it is only a dream. As parents continue to invalidate dreams, children learn to forget or not talk about these experiences. However some people report memorable dream experiences they are unable to forget or dismiss easily. Telepathic and precognitive dreams, for example may have a more lasting impression.

The dreamtime tradition of Australian cultures explains the creation of the world as a dream of the Great Spirit.³ To the ancient Chinese, dreams provided an opportunity to visit with the dead.⁴ In Biblical times, dreams were believed to be gifts from God.⁵ People who could interpret dreams were treated with a great deal of respect.⁶ Some modern day researchers like Myers view dreams as nothing more than hallucinations of the sleeping mind.⁷

Previous articles have offered dream theories based on different perspectives, yet none of these have offered a model that maps out the spatial domain and temporal zone in which we experience dreams.⁸⁻¹¹ A multi-dimensional model has been constructed to fill this void. It provides a guide for measuring the dream state and also presents

possibilities for explaining the physical nature of dreams through integration of key theories in physics. First, an overview of perception is presented.

ABILITIES OF PERCEPTION

In the waking state of consciousness (SoC), perceptions are primarily shaped by sensations. There are five main categories of sensations that conventional science recognizes:

- 1) Photoreception (vision)
- 2) Phonoreception (audition)
- 3) Proprioception (kinesthetic) & Equilibrioception (vestibular)
- 4) Thermoreception, Tactition & Nociception
- 5) Chemoreception (pheromocception, olfaction, gustation)

Each sensation provides a range of information in the waking state. As we shift from a waking to a dreaming state, *imagination* replaces sensation as the dominant ability for shaping our perceptions. Unlike sensation, which depends on the functioning of different physiological organ receptors, imagination functions through a generative process, not a receptive one. We know the human brain is able to both receive and generate multiple kinds of images so whatever we can sense in waking, we can imagine in dreaming. Studies have shown that the same regions of the brain become activated whether the information is sensed or imagined.¹² One may wonder if the brain can really distinguish between what it senses from what it imagines.

In this paper I am introducing some new equivalent terms shown below to balance the distinction between sensation and imagination:

- | |
|--------------------------------|
| Sensation |
| 1) Photoreception |
| 2) Phonoreception |
| 3) Tactition & Thermoreception |
| 4) Chemoreception |

- | |
|---------------------------------|
| Imagination |
| 1) Photogeneration |
| 2) Phonogeneration |
| 3) Tactition & Thermogeneration |
| 4) Chemogeneration |

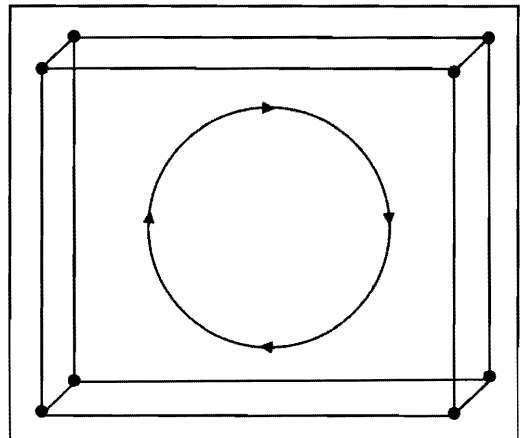
Photoreception helps us sense objects visually during waking, and *photogeneration* helps us imagine visual objects while dreaming. Although both provide visual perception, one functions by use of sensory receptors and the other through imaginary generators. Kastner et al. found that imagining something visually activates the visual cortex of the brain.¹³ However, losing the function of one does not necessarily lead to the loss of the other. Thus people who have lost their sensory ability for sight in a waking SoC can still generate visual images during dreams. *Phonoreception* and *phonogeneration* both provide audio perceptions, but one is sensory and the other is imaginary. *Thermogeneration* describes perceptions of temperature in dreams. *Chemogeneration* can be used to describe perceptions of smell and taste in dreams. Of all these equivalent terms, tactition seems universal enough to describe the

sensory and imaginary perceptions of touch in either state. Comparing models of space and time can gain a deeper understanding of the connection between the waking and dreaming states.

CONVENTIONAL MODEL OF SPACE AND TIME

Dimension is a term used in geometry to measure the physical parameters of an object in space and time. The commonly held notion is that our physical world has three dimensions of space (e.g. latitude, altitude and longitude). The Cartesian coordinates can represent these three dimensions on an axis: x, y and z. *Euclidean Geometry* is the branch of mathematics that uses three or fewer dimensions of space. Einstein proposed that time could be added as another dimension.¹⁴ This standard 4D space-time model (figure 1) is still widely used today to measure different physical phenomena in the world of waking consciousness. A cube represents the three dimensions of space,

Figure 1. Conventional 4D Spacetime Model- three dimensions of space plus one dimension of time



and the circle flowing clockwise represents the one dimension of time. We can measure the *size* of any physical object in the world of waking consciousness using these three dimensions of space, and we can measure its *age* using the dimension of time. Every corner of the cube is formed by an intersection of 3 perpendicular planes representing the 3 dimensions of space. Using a clock, we are able to record the seconds, minutes and hours of time.

These dimensions do not represent reality, as we know it. While looking at the model, one would think that space is flat and only follows straight lines. Time appears to be circular. Actually space can be curved, and time can be linear. This model does not completely represent our reality, but it does demonstrate how dimensions are used as a way to measure objects. As good as this model seems, it fails to provide a helpful means for directly measuring objects experienced in other conscious states such as dreaming, reverie, and day-dreaming. Newer space-time models expand the number of spatial dimensions.

SPATIAL DOMAINS

Hyperspace refers to any space with more than three dimensions. Bogzaran had previously introduced the concept of *hyperspace lucidity* and its relation to lucid art.¹⁵ *Riemannian Geometry* is a branch of mathematics that uses four or more dimensions of space. Some of the more recent theories in physics (e.g. strings and membranes) use models that contain as many as 10, 11 and even 26 dimensions.¹⁶ A hypercube can be used to depict 4 or

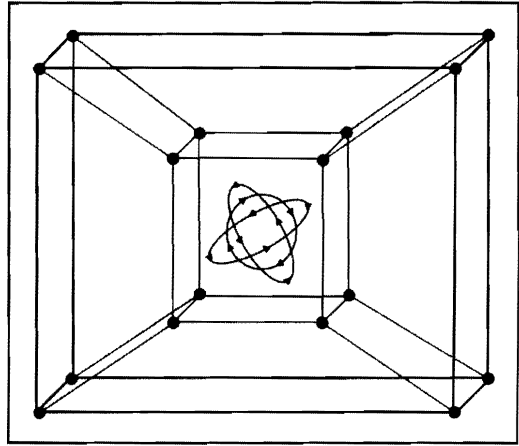


Figure 2. Radical 4D Timespace Model- three additional dimensions of time plus another dimension of space

more dimensions. Figure 2 shows an example of a hypercube. An additional inner cube now appears connected at all corners. Notice at each intersection there are now four dimensions of space as compared to just three in figure 1. The outer cube in this model still represents the domain of the waking SoC, but now we can see an inner cube, which represents the domain of dreaming. This fourth dimension of space is what connects the two domains. During waking consciousness, we seem quite focused on the outer cube with sensation, but if we close our eyes, we can tune in to this inverse cube through imagination. As we go to sleep, we naturally drift through this fourth spatial dimension and eventually we become more attuned to the inner domain of dreams where everything seems to be three dimensional, as in our waking domain. To return, we must again access the fourth dimension, which allows us to mentally shift our attention into the outer domain of

waking consciousness. Throughout our lives we repeatedly move between these two domains via the fourth dimension.

TEMPORAL ZONES

In addition to another spatial dimension, this multidimensional model also proposes three additional temporal dimensions as indicated by the three dynamic loops in figure 2, which can help explain the non-linear events that often occur in dreams. Unlike our experience of only one temporal dimension (see figure 1) in the outer waking zone, we seem to experience 3 dimensions of time in the inner zone of dreams and are able to move more easily between past, present and future. For a one-dimensional domain (e.g. a line), movement is restricted or limited by the slowest moving object since there is no way to pass by. In a two-dimensional domain (e.g. a plane), the second spatial dimension (left to right) gives one an option to easily go around a slower moving object. Likewise adding a third dimension (up and down) and appropriate technology, one could potentially reach a destination within seconds. If it's true that time in the outer waking zone is only one dimensional, flowing in one direction at a constant rate arbitrarily designated in seconds, minutes, hours, etc., all perceptions are limited to this fixed pace. Without another dimension of time, there is no way to skip ahead to experience possible future events. But we can and do experience time shifts in the dream zone. There is an enormous amount of evidence supporting precognitive experiences of events during dreams, which is the most commonly reported of all psychic experiences.¹⁷

Experiences of past events in retrocognitive dreams are also frequently reported.¹⁸ This model proposes that we can swiftly access any event of the future or past because three temporal dimensions are available to us. Shifting ahead in time allows us to experience events within minutes or seconds that would normally take hours, days or even years to develop in the outer waking zone.

A map of dream experiences can thus be described by use of a 4D time-space model (three dimensions of time, plus one dimension of space). Two of the temporal dimensions flow counterclockwise and one flows clockwise in the dream zone. All three intersect making it possible to move freely between any past or future event. Dream experiences have provided humanity glimpses or sneak previews of upcoming events and influenced artistic expression. Typical movie story lines simulate the flow of dreams. In a two-hour movie many years may elapse as the events shift between the future and past many times.

PHYSICS AND THE DREAMING REALM

Recent proposals by Hawking (e.g. imaginary time) and Abraham (e.g. slope time) both include an additional dimension of time.^{19,20} Three dimensional models of time have also been presented as well. Saniga's Algebraic Geometric Configuration includes a *quadro-cubic* space-time (three dimensions of space and one dimension of time) and a *quadro-quartic* reversal (three dimensions of time and one dimension of space).²¹ Larson's Reciprocal System Theory consists of three dimensions of space and three dimensions of time.²² To

Larson, the physical part of the universe is divided equally into a *material* sector, having 3 spatial dimensions and one temporal dimension; and a *cosmic* sector, with three temporal dimensions and one spatial dimension. For him, this inverse connection of space and time helps explain the relationship between two distinct energetic substances: *matter* and *anti-matter*. In his theory, matter predominates in the material sector while anti-matter is most prevalent in the cosmic sector.

The dichotomy of these two energetic substances (matter and anti-matter) has been posited in physics since the early twentieth century. In 1928 Paul Dirac theorized that the charge carrying particles (*electrons*) in an electric field have twin particles that carry an opposite charge. Dirac attempted to combine special relativity with quantum theory to explain the behavior of electrons. His equation $x^2 = 4$, which can have two possible solutions ($x = 2$ or $x = -2$), provided one for electrons that have positive energy and one for electrons with negative energy. Carl Anderson later discovered *positrons*, a.k.a. *anti-electrons*, in cosmic rays in 1932.²³ These positrons may appear to be flowing opposite to electrons, or backwards in time.²⁴ Today, researchers benefit from the use of positrons by utilizing a technology known as *positron emission tomography* (PET). Since anti-matter seems more difficult to observe by comparison to matter while experiencing waking consciousness, its effects are much more subtle in nature. Many other anti-particles have been discovered since the positron, including the *anti-*

proton and *anti-neutron*. One of the more interesting features in Larson's theory concerns the notion of *unit speed*, which is the speed of light (c) in a vacuum (approximately 299,792,458 meters per second or about 186,282 miles per second). In his theory, it is possible to achieve greater than unit speed via motion in time. His theory also claims that highly energetic anti-particles from the cosmic sector can spontaneously cross over into the material sector in the form of cosmic rays. When energetic particles travel at velocities greater than light particles do in a particular medium, they produce a shockwave or glow of light called *Cerenkov radiation*, named after Pavel Cerenkov who first observed this effect in 1934.²⁵

Following his own theory of electrically charged particles, Dirac predicted in 1931 that the magnetic force must have oppositely charged particles or *magnetic monopoles* (N or S). Radovic theorized that *Cerenkov particles* are magnetic monopoles or *magnetons*.²⁶ Fang et al. have indirectly detected magnetic monopoles in a ferromagnetic crystal.²⁷ Tiller developed a theory that not only contains magnetic monopoles, but also a *magneto-electric* (ME) field, which is the reciprocal complement of the well-known *electro-magnetic* (EM) field.²⁸ He also believes this type of subtle energy plays a major role in healing the body.

Tiller explains EM and ME radiations as mirror images of each other. The main difference is that ME fields naturally exist at superluminal speeds ($v > c$) in a reciprocal

space. Einstein's special theory of relativity does not exclude particles (e.g. *tachyons*) to come into existence already traveling faster than unit speed, but states that it would be virtually impossible to slow these particles down ($v < c$), or even accelerate a naturally slower moving particle (e.g. *tardyons*) faster than unit speed ($v > c$) because it would take an infinite amount of energy.²⁹ In Tiller's theory, ME fields increase in speed as the density of the medium increases, whereas EM fields tend to slow down as the medium becomes denser. Wang et al. was apparently able to observe/produce a pulse of light in a medium of cesium vapor that was clocked at 310 times the speed of light in a vacuum.³⁰ Gauthier et al. exceeded unit speed by producing a pulse of light in a medium of potassium vapor.³¹ Since both mediums (cesium and potassium) are more dense than a vacuum, in theory these two experiments could represent measurements of an ME field. To date, no additional experiments have verified or falsified evidence of either magnetic monopoles or ME fields. The proposed model in this paper hypothesizes that these subtle energies (magnetic monopoles and ME fields) will be more directly experienced in the dream state.

ME LIGHT IN THE DREAM STATE

A strong argument against the sensory receptors being directly involved in dreaming is that dreams for the most part occur at night or in a dark setting. Without light, the photoreceptors of the eyes cannot help us see reflections of different objects. Since the eyes' photoreceptors require at least 7 to 9 photons to see even the tiniest

flashes of light, one should not be able to see a vivid image with the eye lids closed.³² Surprisingly, the eyes appear to have a photogenerator function as well. Rapid eye movement (REM) is an example of how the eyes can be involved with the brain generating multiple images during dreams. From an inner perspective, the dream experience tends to be filled with visible light and images of different people, places and things. According to Tiller, the human body naturally radiates ME fields, which have been externally measured by electromagnetically shielded devices.²⁸ If the body naturally generates magneto-electricity, one hypothesis that could be tested is whether these fields are more directly measurable within the realm of dreams.

ENERGY OF THE MACROCOSM

Besides the human body, other possibilities of ME fields observed in nature may be found in cosmic rays. This type of radiation can produce energies as high as 10^{20} eV.³³ While not part of the EM spectrum, these rays constantly bombard the Earth from every direction of outer space, which means this type of energy pours through our bodies even during the nighttime hours. Kephart and Weiler suggest that the highest energies produced in cosmic rays are due to magnetic monopoles.³⁴ Quasars and even black holes may explain where these highly energetic rays originate from.³⁵ The gravitational fields of black holes are believed to be so great that not even light can escape. Contrary to this popular notion, Stephen Hawking discovered in 1974 that black holes can emit radiation because their intense gravitational field

causes the creation of pairs of particles and anti-particles, one of which falls into the black hole and the other which escapes; for radiation to escape the intense gravitational field of the black hole its speed must be greater than c .¹⁹ Frampton and Kephart calculate that primordial black holes may emit 10^{21} positrons per second.³⁶ Hawking also postulates that what goes into a black hole may come out of a time reversed white hole on the other side. As time gains dimensions on the far side of the event horizon, space by contrast loses them.³⁷ Quasars, which may very well be white holes, typically generate about 10,000 times as much energy as an ordinary spiral galaxy and are hypothesized to be fueled by super massive black holes.^{38,39} If ME fields are eventually found in cosmic rays, it is likely some part of our body is able to perceive it. Perhaps EM and ME fields are analogous to the interaction between the waking and dreaming states.

ENERGY OF THE MICROCOSM

Samantha-Laughton postulates that black holes occur at every level of the universe, from the very large—in the centers of galaxies, to the very small—inside atoms and somewhere in between.⁴⁰ Greene suggests that micro black holes may be as small as an electron with the same mass and charge.⁴¹ If these micro black holes really exist somewhere inside our own bodies, it may explain how we can naturally generate superluminal energies from within. Since energy is a requirement for remembering events occurring in the dream state, the gravitational fields of micro black holes existing deep within the receptors of our

nerve cells might provide us with some clues of why the contents of many of our dream experiences are so difficult to recall after regaining waking consciousness. The contents of our dream experiences seem to include people, places and things that we have already experienced in waking consciousness. To understand how this may be possible, picture the waking realm existing on one side of a black hole, and the dreaming realm existing on the other side of a white hole. When we experience some of our memories from waking consciousness as bizarre manifestations in our dreams, the energetic flow of these memories must first escape from the waking realm through a black hole, and then exit through a white hole to become part of the energetic flow of the dream realm. Micro white holes are hypothesized to exist deep within the generators of nerve cells. The bizarreness of the dreaming realm can be attributed mainly to the reversal of 4D space-time to 4D time-space.

TWIN COMPLEMENTARY BODIES

Figure 3 is another 4D expression of space and time. In this diagram, the cube on the right represents the realm of the waking SoC and the cube on the left is the realm of dreaming. The body on the right, known as the *physiological body*, consists of multiple sensory organs, and exists within a 4D space-time realm. Its twin double is called the *imaginal body*, which consists of multiple imaginary organs, and exists within a 4D time-space realm. In dreams, the imaginal body may appear to us like our physiological body does in waking consciousness. Monroe gives a detailed

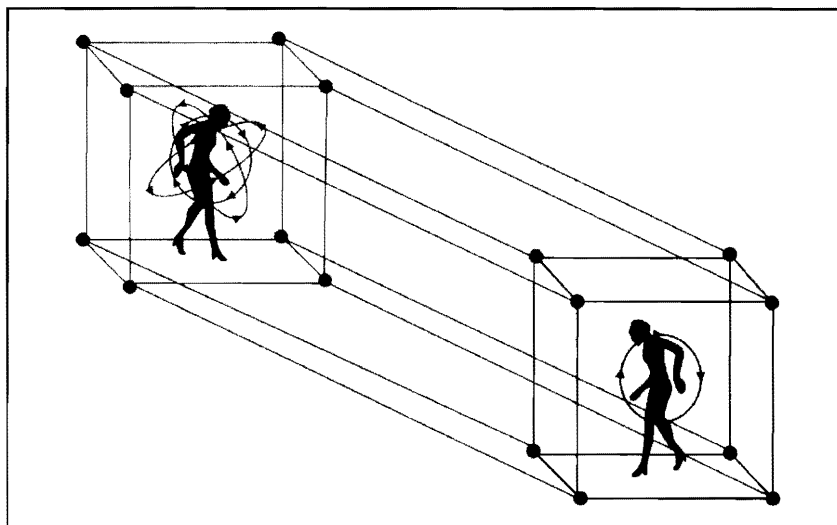


Figure 3. A 4D mirror image of a woman's physiological body (within the cube on the right) and her imaginal body (within the cube on the left). Human biology is hypothesized to be a combination of these two interrelated bodies working together. In waking consciousness we can use one dimension of time to measure the exogenous diurnal biorhythm, which is synchronized with the day/night cycle. And in dreaming consciousness we can use three temporal dimensions to measure three endogenous biorhythms (circadian, ultradian and infradian). Utilizing multiple dimensions of space and time enables us to measure the size and age of any perceivable physical object, including all known biological organisms.

description of a “second body” and suggested that it may consist of anti-matter.⁴²

Tiller's model presents two reciprocal bodies that he calls the *physical* and *etheric*.²⁸ According to Tiller's Mirror Principle, the properties of the physical body include positive entropy, mass, temperature and energetic states, which are opposite of the negative entropy, mass, temperature and energetic states of the etheric body. The term entropy describes the tendency toward disorder. In physics, chaos theory explains the most dynamic order-disorder of energy around us.⁴³ All physical objects are affected by positive entropy. The natural process of bodily decomposition is an

example. However, negative entropy is also an integral part of all biological organisms.⁴⁴ Nutrients released by the digestive process are used to build up and replenish our bodily structure, resulting in growth and renewal; this is an example of negative entropy. Biologists can measure the effects of both positive and negative entropy by studying the anabolic and catabolic processes of biological organisms. The term *bio* not only means life, but it also means *dual* or two, reflecting this tension between opposing yet complementary physical processes (positive and negative entropy). The model in figure 3 proposes that our biological nature is the combination of two bodies (the imaginal and physiological) working together.

CORRELATION OF DREAMS WITH NEGENTROPY

If we examine the life of a person, most of the biological growth happens early in life, especially within the first several years. Interestingly the amount of time a child spends in the dream zone is very high compared to that for adults after puberty. Infants typically spend 13 ½ to 16 ½ hours a day sleeping.⁴⁵ The highest averages come from newborn infants who spend about 70% of their sleep time dreaming, while adults only spend about 20% of their sleep in dreams.⁴⁶ REM actually occurs during sleep onset for infants, whereas non-rapid eye movement (NREM) occurs during sleep onset for adults.¹² Most vivid dreams occur during REM sleep, which produces brainwaves that most resemble waking consciousness.⁴⁷ Researchers now understand the necessity of dreaming in early childhood development.⁴⁸ People who have been deprived of dreaming early in life tend to have more difficulties functioning while in a waking SoC (e.g. behavioral problems) due to permanent sleep disruption, an abnormal amount of brain cell death and decreased brain mass.^{49,50} When most people dream, their physiological bodies experience paralysis, which prevents them from acting out their dreams and gives the body an opportunity to not only rest and restore, but grow and develop. LaBerge and DeGracia found sleep paralysis to be commonly reported in dreaming.⁵¹

Figure 3 provides a map of where we consciously shift our attention when our physiological body experiences paralysis. The temporal dimensions in this model

provide two interconnected zones for measuring the four known biological rhythms. In the waking zone, the exogenous *diurnal* rhythm is synchronized with the day/night cycle.⁵² People living closer to the equator will always experience more sunlight on average than those who live closer to the poles so their diurnal rhythms will differ in duration. In the dream zone, the endogenous *ultradian*, *circadian* and *infradian* rhythms are all linked, but differ in cyclic durations. The ultradian rhythm is less than 24 hours; the circadian rhythm is about 24 hours; and the infradian rhythm is over 24 hours.⁵³ One example of the ultradian rhythm is the shifting dilation of the nostrils, which changes in dominance from one side to the other approximately every 90 minutes.⁵⁴ The human menstrual cycle would be an example of the infradian rhythm. This type of biorhythm plays a major role in the behavior of animals that both migrate and hibernate.

MULTIPLE POSSIBILITIES IN HYPERSPACE

Figures 4A and 4B provide eight examples of how 4D hypercubes can be illustrated on a 2D surface. We can use these examples to explain how we can perceive multiple kinds of images within 3D slices of a more complex 4 dimensional world. Within 4D hyperspace we can actually view eight overlapping 3D cubes or parallel/alternate scenarios. As we fall asleep, we normally shift from a waking SoC to a hypnagogic state. Within each of these discrete states we can experience 3D perception, as indicated by the two examples in figure 4A

Figure 4A. Multiple 3D slices exist within a 4D hypercube. Some examples include the waking state (top right), the hypnagogic state (top left), and two dreamscapes (bottom left and right).

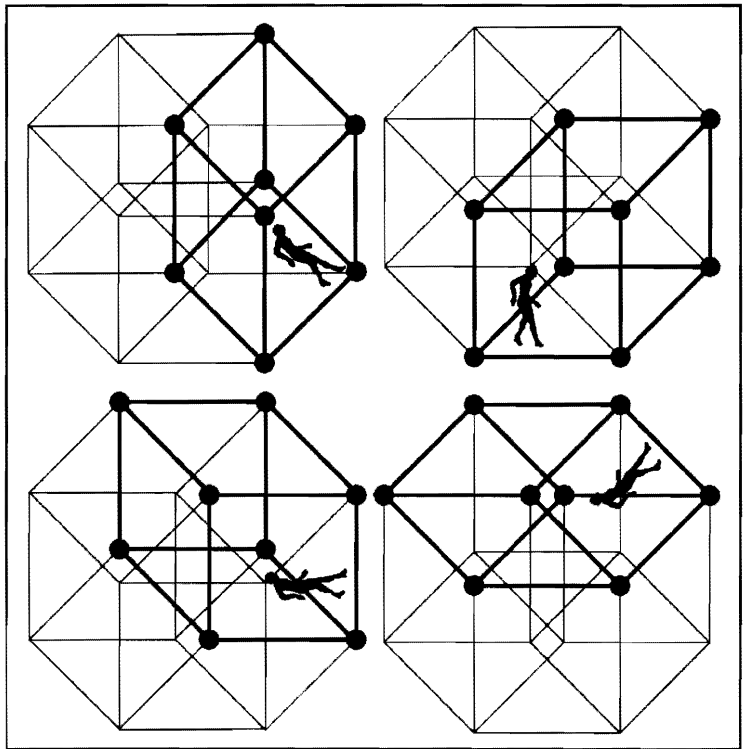
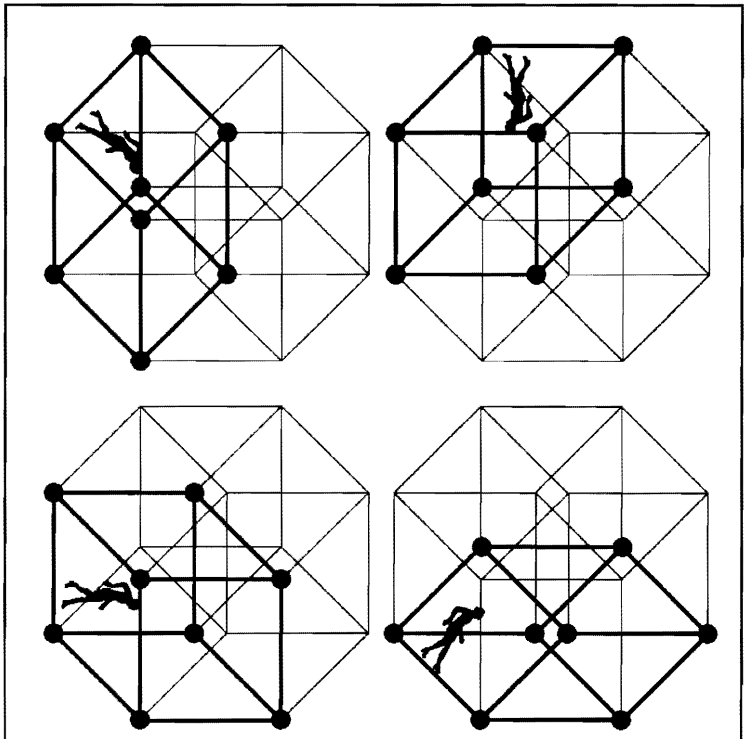


Figure 4B. Some other examples of perceiving 3D images within 4D hyperspace include experiencing three more dreamscapes and the hypnopompic state (bottom right) before waking up.



(top right and top left). During eight hours of sleep the average person may experience four to five vivid dream episodes. These particular 3D scenarios or dreamscapes are also shown in figure 4A (bottom left and right), as well as in figure 4B (top right and left, and bottom left). We can also experience 3D perception in the hypnopompic state, which is what we usually experience before waking up. An example of this particular scenario is also shown in 4B (bottom right). If the human body is similar to a radio or television in any way, then some part of our biological structure must function like a radio dial or channel flipper. This would allow us to tune in to a particular 3D slice of 4D hyperspace. By changing the channel or adjusting the dial, we can become more aware of what's happening within one of these particular 3D scenarios. We may not necessarily tune our awareness in to each and every one of these particular 3D slices throughout the night, but instead we may choose to revisit the same scenario more than once, especially if we experience something within it that really captures our interest. For instance, if we suddenly wake up from a particular dream, we may choose to return to the same dream instead of accessing another dreamscape. Many people report having reoccurring dreams, which also infers revisiting the same dreamscape over and over again.

Within a 4D world, we may experience each of these eight 3D slices as distinct scenarios, but with noticeable overlapping similarities. Even if a dream seems so bizarre and unrealistic as compared to what we may usually

experience during waking consciousness, it doesn't mean there isn't some kind of synchronistic connection. For instance, in one dreamscape a woman may star in a play on Broadway, while in another dream she could be working as an accountant for a big law firm. Neither of these particular roles may resemble her actual occupation in the domain of waking consciousness, but they may inspire her to make a career change. Regardless of how different each scenario may seem from one another, the fourth dimension links them altogether, making it possible for one to influence another. In quantum theory, the so-called "spooky action at a distance" is an example of *quantum entanglement*, which explains how energetic particles remain connected and are able to influence each other instantly, even though they may appear to be separated by distance.⁵⁵ Based on some of the principles of quantum theory, some theoreticians have exercised the possibility that we live in a *multiverse* where there are alternate realities and parallel universes.⁵⁶ "In this view," says theorist David Deutsch from the University of Oxford, "our Universe is only a tiny facet of a larger multiverse. Everything in our Universe—including you and me, every atom and every galaxy—has counterparts in these other universes."⁵⁷

This 4D model can be interpreted as either a multidimensional universe or a multiverse containing eight overlapping 3D universes. We can access multiple 3D scenarios within a 4D multiverse by experiencing other states of consciousness like *reverie* and *daydreaming*. According to Krippner, *reverie* is a SoC characterized with REM,

which can be experimentally induced by a hypnotist, whereas day-dreaming is a SoC that can occur with eyelids opened or closed; with eyelids closed, imagery may appear along with REM.⁵⁸

DREAMERS AS RESEARCHERS

Tart proposed the need for state specific sciences because he believes each state of consciousness has its own logic, ways of perceiving, and rules for validation.⁵⁹ He claimed that the best way to collect data on a discrete SoC is for the researcher to actually be in that specific SoC during observation. If we can consciously or unconsciously shift between the waking and dreaming states via the fourth dimension, it is possible for any scientist to develop the skills necessary for making direct observations and conducting experiments in the dreaming realm with the same competence as they would usually perform in the waking realm. Below are Tart's recommended guidelines.

There are many technologies available to help train researchers to access these states more successfully such as biofeedback

devices, along with different techniques like hypnosis, relaxation, visualization (e.g. guided imagery), and meditation. The realm of dreams might very well be an experimental testing ground for physicists to explore in confirming or rejecting the existence of anti-matter and magnetic monopoles. If Larson, Tart and Tiller are correct, the majority of physicists have been unsuccessful in their attempts of measuring magnetic monopoles and mass quantities of anti-matter because they have been searching in the wrong place using a non-conductive SoC.

This multidimensional model could be applied to a number of research questions in different professions. In the field of psychology, particularly *oneirology*, correlating the endogenous biorhythms with multiple dreamscapes could provide researchers a better means of measuring the behavior of any dreamer in a particular scenario. Behaviors measured in dreams may leave traces or clues that are directly connected to the positioning (e.g. back, front, left and right) and vital signs (brainwaves, heart rate, blood pressure, etc.)

- 1.) A scientist should be able to function skillfully in a discrete SoC.
- 2.) A scientist may be observer, subject and experimenter simultaneously.
- 3.) A scientist could collect data in experimental work with other subjects in that SoC.
- 4.) A scientist could be in that SoC at the time of data collection, data analysis or theorizing.
- 5.) A state specific scientist's quest to seek data and then transport the data across a bridge of transformation from that state to waking consciousness.
- 6.) The goal of state specific sciences is to gather information about that discrete state and then combine this information with information obtained from other states so that a final comprehensive theory might be proposed, tested and further refined.
- 7.) All states must be explored before the phenomenon of consciousness can be understood.

of the physiological body. For clinicians and counselors working in mental health who already utilize dream therapy, this model can be used to help their clients/patients better understand their dream experiences and why sleeping/dreaming is so important for healing the body. In the field of medicine, acknowledging the nature of subtle energies (ME fields and anti-matter) and how they relate (negative and positive entropy) to the conventional energies (EM fields and matter) within a biological organism can provide medical researchers a better understanding of how certain types of medications (including homeopathy) work, and even treatments that use energy more directly such as: electric convulsive therapy (ECT) to treat depression and light therapy to treat seasonal affective disorder (SAD). Using this model to help explain the nature of how one body (e.g. the imaginal) affects the other (e.g. the physiological) and vice versa might determine why certain treatments for physical ailments are more effective than others; and how sometimes using less (e.g. homeopathic dilutions) is actually better for restoring a more balanced working relationship between these two bodies.

As state specific scientists, each of us must train ourselves to become more competent *oneironauts*—explorers of the realm of dreams. Organizations like the Lucidity Institute offer helpful services, but each person must overcome their preconceived limitations. We have the capability to imagine things from the inner realm of dreams while we are experiencing a waking

SoC and to sense things from the outer realm of wakefulness while we are experiencing a dreaming SoC. Although it's possible to be aware of both realms simultaneously, it is rather difficult because we have been conditioned to only tune into one particular realm at any given moment. From figure 2 we infer that one can be either fully aware of what's going on in the outer cube, or the inverse cube, but not both. This is similar to how we view Gestalt diagrams with dual images (e.g. a picture that displays an image of a young and old woman). Most people can only recognize one or the other at any given moment, but cannot recognize both at once. For a true 4D perception of the world, we have to be aware of events happening in both realms regardless of our specific SoC at that moment. Figure 3 shows the possibility of *bi-location*, one possible way to consciously experience both realms simultaneously.

More than a decade ago the market was flooded with commercial art called *Magic Eye*, which displayed various pictures embedded in computer graphically designed patterns. Upon closer examination, these pictures show 3D images of objects within the patterns. Observers learned to see the 3D image by focusing the eyes in a slightly different way. If it is possible to see a 3D image on a 2D surface then we should be able to train our brain to recognize a 4D form in a 3D space. Perhaps people who perceive ghosts or apparitions already do. To fully experience the world 4 dimensionally, we would practically seem god-like to a 3D life form in comparison. According

to Kaku, a 4D person would be capable of passing through walls, disappearing and reappearing at will, seeing through buildings and finding hidden objects, and performing a surgery without even cutting the skin.¹⁶ One can only imagine what it would be like if doctors could observe cancerous growths within the body and then surgically remove them without leaving any bodily scars simply by learning to access the fourth dimension. To date, many oneironauts have reported manipulating objects with some degree of control during lucid dreaming.⁶⁰ As we continue to explore the fourth dimension through our dreams and other states of consciousness like reverie and day-dreaming, eventually we will learn how to integrate these experiences so we can perceive the world more four dimensionally. This multidimensional model can provide us with a guide.

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REFERENCES & NOTES

1. B.O. States, Dream Bizarreness and Inner Thought, *Dreaming: Journal of the Association for the Study of Dreams* **10**, 4 (2000), pp. 179-192.
2. R.M. Knudson, Significant Dreams: Bizarre or Beautiful? *Dreaming: Journal of the Association for the Study of Dreams* **11**, 4 (2001), pp. 167-177.
3. F.A. Wolf, *The Dreaming Universe* (Simon & Schuster, New York, 1994).
4. R. Van de Castle, *Our Dreaming Mind: The History and Psychology of Dreaming* (Ballantine

- Books, New York, 1994).
5. P.R. Koch-Sheras & A. Lemley, *The Dream Sourcebook* (Contemporary Books, Chicago, 1995).
6. S. Krippner, C. Jaeger & L. Faith, Identifying and Utilizing Spiritual Content in Dream Reports, *Dreaming: Journal of the Association for the Study of Dreams* **11**, 3 (2001), pp. 127-147.
7. D.G. Myers, *Psychology* (Worth, New York, 2001).
8. E. Hartmann, Outline for a Theory on the Nature and Functions of Dreaming, *Dreaming: Journal of the Association for the Study of Dreams* **6**, 2 (1996), pp. 147-170.
9. G.W. Domhoff, A New Neurocognitive Theory of Dreams, *Dreaming: Journal of the Association for the Study of Dreams* **11**, 1 (2001), pp. 13-33.
10. J.M. Mageo, Toward a Halographic Theory of Dreaming, *Dreaming: Journal of the Association for the Study of Dreams* **14**, 2-3 (2004), pp. 151-169.
11. D. Kahn & A. Hobson, Theory of Mind in Dreaming Awareness of Feelings and Thoughts of Others in Dreams, *Dreaming: Journal of the Association for the Study of Dreams* **15**, 1 (2005), pp. 48-57.
12. M.S. Franklin & M.J. Zyphur, The Role of Dreams in the Evolution of the Human Mind, *Evolutionary Psychology* **3**, (2005), pp. 59-78.
13. S. Kastner, M.A. Pinsk, P. De Weerd, R. Desimone and L.G. Ungerleider, Increased Activity in Human Visual Cortex During Directed Attention in the Absence of Visual Stimulation, *Cortex* **22** (1999), pp. 751-761.
14. A. Einstein, *Relativity: The Special and the General Theory* (Crown Publishers, New York, 1961).
15. F. Bogzaran, Lucid Art and Hyperspace Lucidity, *Dreaming: Journal of the Association for the Study of Dreams* **13**, 1 (2003), pp. 29-42.
16. M. Kaku, *Hyperspace* (Oxford University Press, New York, 1994).
17. E.A. Rauscher & R. Targ, The speed of Thought: Investigation of a Complex Space-Time metric to Describe Psychic Phenomenon, *Journal of Scientific Exploration* **15**, 3 (2001), pp. 331-354.
18. L. Auerbach, *Psychic Dreaming* (Warner Books, New York, 1991).
19. S. Hawking, *Black Holes and Baby Universes and Other Essays* (Bantam Books, New York, 1993).
20. R.H. Abraham, A Two-Worlds Model for Consciousness, *Proceedings, Subtle Energies and Uncharted Realms of Mind*, Esalen Institute (Big Sur, CA, Jul, 2000).

21. M. Saniga, On an Intriguing Signature Reversal Exhibited by Cremonian Space-Times, *Chaos, Solitons and Fractals* **19** (2004), pp. 739-741.
22. D.B. Larson, *Nothing But Motion* (North Pacific Publishers, Portland, OR, 1979).
23. L. Lederman & D. Teresi, *The God Particle*, (Delta, New York, 1993).
24. R.P. Feynman, The Theory of Positrons, *Physics Review* **76**, 6 (1949), pp. 749-759.
25. F. Close, M. Martin & C. Sutton, *The Particle Explosion* (Oxford University Press, New York, 1987).
26. A. Radovic, Cherenkov's Particles as Magnetons, *Journal of Theoretics* **4**, 4 (2002).
27. Z. Fang, N. Nagaosa, K.S. Takahashi, A. Asamitsu, R. Mathieu, T. Ogasawara, H. Yamada, M. Kawasaki, Y. Tokura & K. Terakura, The Anomalous Hall Effect and Magnetic Monopoles in Momentum Space, *Science* **302**, 5642 (2003), pp. 92-95.
28. W.A. Tiller, *Science and Human Transformation* (Pavior Publishing, Walnut Creek, CA, 1997).
29. P.C.W. Davis & J. Brown, *Superstrings: A Theory of Everything?* (Cambridge University Press, New York, 1988).
30. L.J. Wang, A. Kuzmich & A. Dogariu, Gain-Assisted Superluminal Light Propagation, *Nature* **406**, (2000), pp. 277-279.
31. D.J. Gauthier, M.D. Stenner & M.A. Neifield, The speed of Information in a 'Fast-Light' Optical Medium, *Nature* **425**, (2003), pp. 695-698.
32. S. Hecht, S. Schlaer & M.H. Pirenne, Energy, Quanta and Vision, *Journal of the Optical Society of America* **38**, (1942), pp. 196-208.
33. D. Muller, The Composition of Cosmic Rays at High Energies, *Advances in Space Research* **9**, 12 (1989), pp. 31-43.
34. T.W. Kephart & T.J. Weiler, Magnetic Monopoles as the Highest-Energy Cosmic Primaries, *Astroparticle Physics* **4**, 3 (1996), pp. 271-279.
35. N. Herbert, *Faster than Light: Loopholes in Physics* (Nal Books, New York, 1988).
36. P.H. Frampton & T.W. Kephart, Primordial Black Holes, Hawking Radiation and the Early Universe, *Modern Physics Letters A* **20**, 21 (2005), pp. 1573-1576.
37. L. Shain, *Art and Physics: Parallel Visions in Space, Time and Light*, (Perennial, New York, 1991).
38. G. Zukav, *The Dancing Wu Li Masters* (Bantam Books, New York, 1979).
39. M. Zeilik, *Astronomy: The Evolving Universe* (John Wiley & Sons, Inc., New York, 1991).
40. M. Samantha-Laughton, *Punk Science: Inside the Mind of God* (O Books, Winchester, UK, 2006).
41. B. Greene, *The Elegant Universe* (Vintage Books, New York, 1999).
42. R. Monroe, *Journeys Out of the Body* (Doubleday & Co., Inc., New York, 1971).
43. V.V. Hunt, *Infinite Mind* (Malibu Publishing Co., Malibu, California, 1996).
44. R. Gerber, *Vibrational Medicine: New Choices for Healing Ourselves* (Bear & Company, Santa Fe, NM, 1988).
45. R. Ferber, *Solve Your Child's Sleep Problems* (Simon & Schuster, New York, 1985).
46. M. Ullman, S. Krippner & A. Vaughan, *Dream Telepathy* (Penguin Books, Baltimore, MD, 1973).
47. M.P. Walker, Sleep to Remember, *American Scientist* **94**, 4 (2006), pp. 326-333.
48. G.A. Marks, J.P. Shaffery, A. Oksenberg, S.G. Speciale & H.P. Roffwarf, A Functional Role for REM Sleep in Brain Maturation, *Behavioural Brain Research* **69**, 1-2 (1995), pp. 1-11.
49. M.J. Morrissey, S.P. Duntley, A.M. Anch & R. Nonneman, Active Sleep and Its Role in the Prevention of Apoptosis in the Developing Brain, *Medical Hypotheses* **62**, 6 (2004), pp. 876-879.
50. M. Mirmiran, J. Scholtens, N.E. Van de Poll, H.B. Uylings, J. Van der Gugten & G.J. Boer, Effects of Experimental Suppression of Active (REM) Sleep During Early Development Upon Adult Brain and Behavior in the Rat, *Brain Research* **283**, 2-3 (1983), pp. 277-286.
51. S. LaBerge & D.J. DeGracia, Varieties of Lucid Dreaming Experience, In R.G. Kunzendorf & B. Wallace (Eds.), *Individual Differences in Conscious Experience*, (John Benjamins Publishing Co., Amsterdam, pp. 269-307, 2000).
52. S. Halstenberg, K.M. Lindgren, S.P.S. Samagh, M. Nadal-Vicens, S. Balt & R.D. Fernald, Diurnal Rhythm of Cone Opsin Expression in the Teleost Fish *Haplochromis burtoni*, *Visual Neuroscience* **22**, (2005), pp. 135-141.
53. B.L. Seaward, *Managing Stress: Principles and Strategies for Health and Wellbeing* (Jones and Bartlett Publishers, Boston, 1994).
54. L. Levitan, A Thousand and One Nights of Exploring Lucid Dreaming, *Nightlight* **4**, 2 (1992), pp. 1, 3, 10-14.
55. J.S. Bell, On the Einstein-Podolsky-Rosen Paradox, *Physics* **1**, (1964), pp. 195-200.
56. M. Tegmark, Parallel Universes, *Scientific American* **288**, 5 (2003), pp. 41-51.

57. M. Buchanan, See Me Here, See Me There, *Nature* **448**, 7149 (5 Jul 2007), pp. 15-17.
58. S. Krippner, Altered States of Consciousness, In J. White (Ed.), *The Highest State of Consciousness* (Anchor Books, Garden City, NY, pp. 1-5, 1972).
59. C.T. Tart, *Transpersonal Psychologies* (Psychological Processes Inc., El Cerrito, CA, 1983).
60. S. LaBerge & H. Rheingold, *Exploring the World of Lucid Dreaming* (Ballantine Books, New York, 1990).

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