

***“Instead, attempt to build everything on the foundation of some ‘grand unified field theory’
... Hope to derive that theory by way of one or another plausible line of reasoning.”¹***

John Wheeler

John Wheeler believed we live in a participatory universe. He wondered if one day we might discover that the universe is a self-synthesized information system.² If he was right, then the discovery of how the universe is assembled and operates would reveal *our* role within the system. We could finally answer the greatest questions of all time – Who are we? Why are we here? What is our purpose?

“A single question animates this report: Can we ever expect to understand existence? . . . Surely someday, we can believe, we will grasp the central idea of it all as so simple, so beautiful, so compelling that we will all say to each other, ‘Oh, how could it have been otherwise! How could we all have been so blind for so long!’”³

John Wheeler

If John Wheeler was correct, then the central idea of existence is so simple that we’ll all wonder how we could have missed it. But how might this be possible? The universe appears to be so vast and complex that the notion that its central idea is simple seems almost absurd. But what if there was a key to its simplicity? What if the key to understanding the universe was to see it as a whole rather than in parts? Isn’t that the way we understand most of the complicated things in our lives? We understand cars, refrigerators, televisions, etc., in wholes, not in parts. We comprehend their central idea – their purpose and how to use them – without ever understanding the details of their construction. Few people know how to build a car from parts, but almost anyone can learn how to drive. Since the purpose of a car is transportation, knowing how to drive is what’s most important. So, it would make sense that if John Wheeler was correct, the manner in which we will understand the universe is by seeing it as a whole rather than as a vast collection of parts.

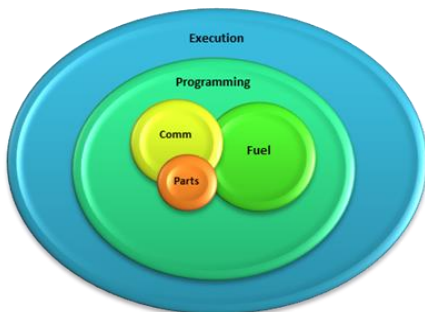
So let’s take that approach. First, we’ll create a model of a self-synthesized information system. We’ll see what it takes to create, maintain, and operate one and then we’ll compare our universe to the model and see if it fits.

What *is* a self-synthesized information system? A self-synthesized information system is a system that creates, operates and maintains itself from within. It has the raw materials along with the assembly instructions it needs to create its own parts and then assemble those parts into a single system that maintains itself. A *participatory* self-synthesized information system – in the sense that John Wheeler was referring to – is a system that *requires* human beings to be part of the system in order for it to be able to create and operate itself.

All information systems require hardware *and* software. Hardware is needed for parts; software for instructions. But a self-synthesized information system has additional requirements. Its software must be able to operate the hardware as well as instruct the system on how to create itself. Furthermore, this type of system must not only create its own hardware; it must also create hardware that *creates its own software*.

Let's take a closer look at what this type of system would require. In addition to the need for parts, the system would require communications. Parts and communications would require energy. So the system as a whole would need to create parts, communications, and energy systems out of its hardware supplies. The system would then be in a position to create the things it required to create the remainder of the system, including its software.

A self-synthesized information system would require two separate software systems in order to operate itself; one for programming and the other for execution. The programming software would contain all of the instructions the system needed; the execution software would carry out those instructions. Together, these 5 subsystems – 3 of hardware and 2 of software – would comprise the system as a whole: parts, communications, energy, programming, and execution.



Notice that the three hardware systems are directly connected to each other. The programming software would have to surround, infuse and permeate the hardware systems in order to direct their behavior. The execution software would encapsulate the entire system, infusing and permeating all of hardware as well as the programming software.

These 5 systems would appear and behave quite differently from each other. They would also need to operate within certain speed limits based upon the overall system's needs. Beginning with the subsystem of parts, the 'need for speed' would increase with each successive subsystem. Communications would have to travel faster than parts. Otherwise, a break in communications could occur which might result in a total system failure. Energy would have to travel faster than both parts and communications; if either outran their fuel supply, everything would grind to a halt. The programming software would have to travel faster than the hardware systems in order to provide them with instructions on what to do. Finally, the system's execution software would have to travel faster than programming in order to carry out its instructions.

A self-synthesized information system has several other features that set it apart from other types. For example, a self-synthesized information system must be tightly constrained to meet its survival needs. It must use its resources wisely; such a system cannot afford to waste time, energy or materials on creating meaningless objects. So the values, settings, and parameters of this type of system will always be tightly constrained to create *only* what it needs to survive and *nothing else*. These constraints offer important insights to the system's construction. Determining the classes of objects the system is constrained to produce *identifies the essential parts of the system* which represent the key pieces to solving the puzzle.

Another indication of a self-synthesized information system can be determined by examining its hardware. If a system's hardware exhibits a wave/particle duality, then the system contains software. The hardware's wave aspect is evidence of its connection to software. But there is an even simpler way to confirm the presence of software within a system. If a system's parts are physically separated and they exhibit *any movement whatsoever* then the system clearly possesses software. The underlying source of the hardware's motion might be given a different

label, such as ‘forces,’ but an observation of such phenomena nevertheless represents the existence of *software* acting upon the hardware within the system.

Also, if two different theories are required to describe the system’s behavior, then it is most likely an information system. Hardware and software are so different in nature from each other that any theory describing one would necessarily have to be quite different from the other. Determining which theory described the hardware and which described the software would be simple. The hardware theory would produce concrete answers and clearly defined results. But the software theory would have to describe things in terms of wave functions and probabilities. Software includes all possibilities within its given parameters. There is no answer until there is a question, and the nature of an answer depends upon the nature of the question. These hardware and software theories would appear to be mutually incompatible; attempting to apply the formulas of one theory to the other system’s behavior would provide wrong answers or nonsensical results. This might lead to the impression that one of the theories was wrong or that the two theories described separate systems. However, the two theories would indicate evidence of a single, combined system containing both hardware and software. Now let’s compare our universe to a self-synthesized information system.

Almost everything about our universe indicates that it is indeed an information system. We see evidence of software’s existence every day; we call them ‘forces.’ Matter exhibits a wave/particle duality indicating its connection to a system of software. Our universe requires two separate theories to describe its behavior. The Theory of Relativity describes the hardware; Quantum Theory describes the software. These two theories work well for the things they describe, but appear to be mutually incompatible. Attempting to use one theory to describe the other’s behavior produces wrong answers or nonsensical results. However, these facts only serve to confirm our universe is an *information* system. They do not indicate if it is a *self-synthesized* information system. To figure that out we must take another step.

“All of science is nothing more than a refinement of everyday thinking.”⁴

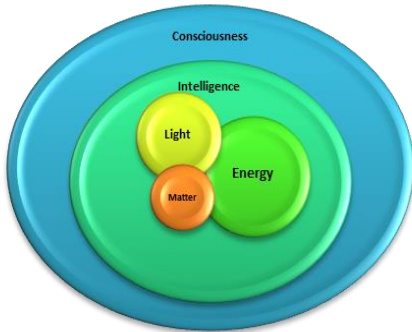
Albert Einstein

If we wish to understand the central idea of the universe, then we must be willing to transform our *thinking*. In order to do this, we *must* think ‘outside the box’ – not just talk about it. We need to imagine as if we’re outside of the universe looking in; not on the inside of the universe looking out. This perspective of the universe as a whole is what will provide us the opportunity we need in order to transform our thinking about what we see. If we’re willing to keep our minds open to new possibilities, and have the intellectual courage to think in new and different ways, then an entirely new picture of the cosmos will emerge. When that happens, we will discover that we have been greatly rewarded for our efforts, for this one small step will result in a giant leap of understanding of the universe, ourselves, and our place within it.

We will not change or ignore the facts. We will not avoid incompatible theories or inexplicable observations. Instead, we will incorporate all of our facts, theories, and observations to date. We *will*, however, rearrange some of our thinking about some of these facts, theories, and

observations, including what they *mean*. This will require that we redefine certain terms, reinterpret certain data, and where no useful definition exists, we will create our own.

Let's begin the process now by defining 'information' in a completely new and different way. We're going to define information as: *everything*. In other words, we're going to define information as the *universal substance* from which everything else is made. Next, we're going to divide our universal substance into five separate information categories. We're going to name them: Matter, Light, Energy, Intelligence, and Consciousness. Now let's see how they fit into the five subsystems of a self-synthesized information system.



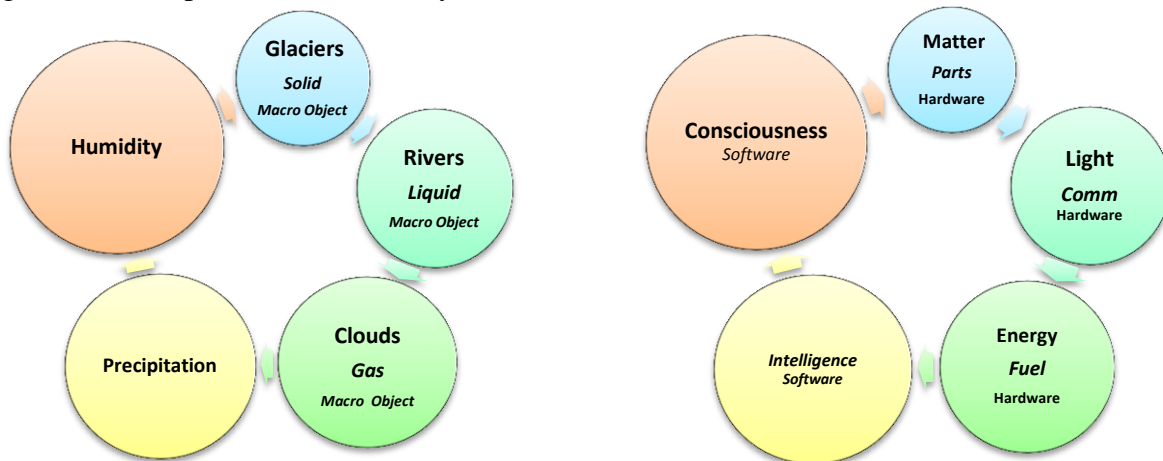
The 'ordinary' matter of our universe is an ideal fit to create a system of parts. It can be a gas, liquid or solid and there are almost 100 different elements, or types, to choose from. This makes it the perfect 'play dough' the universe can use over and over again to create an almost infinite variety of parts, living or inanimate. Light (the electromagnetic force) is precisely the type of communications system our universe would require. It has a wide range of frequencies making it ideally suited to connect the universe's variety of parts. Our universe already has a fuel system in place for its parts and communications – Energy.

Matter, Light, and Energy are not only a perfect fit for a self-synthesized information system's hardware requirements; they also meet its 'need for speed' criteria as well. Nothing in our universe composed of matter – not even a single atom – is allowed to reach or exceed the speed of light. Furthermore, the speed of light in our universe is constant regardless of the speed and direction matter is traveling. Seeing the universe as a self-synthesized information system makes the speed and behaviors of matter and light seem perfectly logical rather than counterintuitive and inexplicable. Furthermore, Einstein's famous equation, ' $e = mC^2$ ', is indicative of the close connection between the three hardware systems of our model. But what about the 'need for speed' requirement of the fuel system? We need it to travel faster – much faster – than parts and communications in order to serve them. Does this same equation come to our rescue? At a glance it might seem that way. From an uninformed perspective of someone thinking only in terms of motion, the equation ' $e = mC^2$ ' *could* be interpreted to mean, '*energy equals mass traveling at the speed of light squared.*' However, conventional wisdom informs us that this is not the case. So now it is time for us to think what nobody has thought before by reinterpreting the data. We will not deny the equation's current interpretation, which, as we shall see, only serves to strengthen the case that the universe is a self-synthesized information system. However, we are going to expand its interpretation. In addition to informing us of the amount of energy contained in matter, we're also going to also interpret this equation to mean that the universe contains a form of energy that *does* travel at the speed of light squared. The purpose of this Information Field is to provide fuel to its internal systems of parts and communications. If this interpretation is correct, it would transform our understanding of many otherwise inexplicable observations, such as photon 'entanglement.'

The Information Field of Intelligence serves the purpose of instructing the universe's hardware, and is remarkably similar in nature to the Internet. It is like an invisible 'cloud' that surrounds, permeates, and infuses the hardware of the universe. It is dynamic and flexible, growing and

evolving along with the hardware systems that upload, download, store, and dispense the information and instructions required to create and run the system. The Information Field of Consciousness permeates, surrounds, and encloses the entire system. In order to execute the instructions, decisions and activities of the system, Consciousness has to be *aware* of everything taking place and then *reflect* back the event as intended. This field exists everywhere, all the time, like an invisible mirror acting as a medium that reflects back *everything* – actions, sensations, thoughts, feelings, emotions, intentions, etc., to its source of origin.

So how does the universe transform a single substance into 5 separate categories whose appearance, behavior, properties, and speed are so different from each other? Let's draw another diagram and compare it to a similar system that's more familiar to us.



Water provides a great analogy. It can be divided into 5 separate categories of glaciers, rivers, clouds, precipitation and humidity. Each one of these things looks and acts in completely different ways; each has unique properties, qualities, and characteristics, and travels at different speeds, *yet are all made from the same underlying substance*. Together, these 5 things form a system that cycles water around our planet. The universe uses Information in much the same way. Matter, Light, Energy, Intelligence, and Consciousness look and act differently, possess unique properties, qualities and characteristics, travel at different speeds, yet are all made from the same underlying substance. Together they form a system. Water is transformed into these different categories by heat, wind, and pressure. How does the universe transform Information from one category into another, i.e., what does it use as its 'Information Transformers?'

The answer is surprisingly simple. The universe uses three classes of objects as its Information Transformers: stars, living things, and human beings. Stars transform Information from Matter into Light and Energy, living things transform it into Intelligence, and human beings transform it into Consciousness.

Stars transform matter into light and energy in order to create the communications and energy systems the universe requires. This is why the values, settings, and parameters of the universe are so tightly constrained to create stars and why it creates so *many* of them – more than 100 billion galaxies containing 100 billion stars each. This also explains why the universe is so incredibly fine-tuned to create *life* – to transform information into Intelligence.

We have only recently discovered just how remarkably finely balanced the values, settings, and parameters of the universe's particles and forces are for the existence of life. The slightest change in some of these things would render the universe completely uninhabitable for living things.⁵ How small a change? Let's use the analogy of a recipe. Imagine that the value of dark energy was equivalent to ordinary 'sand,' and that that it was one of the ingredients life's recipe required. The recipe would work only if *exactly* the right amount was used; too much or too little would cause it to fail. How precise would this measurement have to be? If the value of dark energy required was equal to exactly the amount of *all* of the sand of the Earth's beaches *combined*,⁶ then changing the recipe by less than a *single grain* of sand would cause the entire recipe to fail; life in our universe would be unable to exist. This is only one of many examples of how tightly constrained the values and settings of our universe just happen to be in order for life to exist.⁷ Again, because of the need for a self-synthesized information system to create itself, determining the constraints *of* the system reveal the classes of parts that are required *by* the system. Living things are clearly required by the universe. Living things are *fundamental entities*.

We have also recently begun to discover how incredibly rich the universe is with planets. A recent analysis of Kepler data determined that 50 percent of *all stars* have a planet of Earth-size or larger in a close orbit.⁸ These numbers are staggering. Yet, they're not surprising. Why *wouldn't* most stars have planets? The raw materials, values, and settings are the same throughout the universe. If only half of all stars have just one Earth-size or larger planet, it means that there are 50 billion or more of them in our galaxy alone.

Now, however, we need direct our attention to the manner in which living things transform information into Intelligence. It is here that we must summon our intellectual courage to think differently in order to solve one of the greatest mysteries of all time

The mystery of Life

What is life? Life is easy to spot but difficult to define. What greatly clarifies the situation is our understanding of the whole. Understanding the whole reveals the purpose of its parts. Purpose defines meaning and from this, definitions arise. So let's create our own definition of life. We'll begin with a thought experiment.

Imagine two objects in a petri dish: an amoeba and a grain of sand. The amoeba is alive; the grain of sand is not. The amoeba begins to move – of its own accord. This reveals our first distinction. Both objects can move, but an inanimate object can only do so by virtue of an *outside* force acting upon it. A living thing is capable of generating its own movement from *within*. This underscores an important point: a *decision* preceded the movement of the amoeba. A living thing is a unique system. Any self-generated behavior originating from within the system must necessarily be preceded by one or more *decisions* also created within that system to do so. Now our amoeba bumps into the side of the petri dish, backs away, and changes direction. A second distinction is revealed: a living thing possesses an *internal sense of separation* between its physical boundaries and the environment. Thus, our definition of a living thing:

A living thing has a unique internal decision-maker and an internal sense of separation from its environment; an inanimate object does not.

The purpose of a living thing's internal decision-maker is to keep it alive. It does so by creating decisions that govern its behavior in response to its environment. However, each decision also serves the universe by converting information into software. Every decision contributes to the universe's Information Field of Intelligence. The decision-making process of its living things creates an enormous database the universe requires for its subsystem of programming and instructions. The Information Field of Intelligence is like an invisible 'cloud' that is remarkably similar in nature to the Internet. In fact, we'll call it . . . the 'MentalNet.' The symbiotic relationship between living things and the MentalNet is almost identical to the relationship between the Internet and the devices that connect to it. The biggest difference between the two is their size. Consider how much information is available on the Internet today. By the year 2020 it is estimated that 50 billion devices will be connected to it.⁹ Now consider the fact that a single living cell contains and generates far more information than a typical cell phone or computer. When you take into account that the human body has more than 50 *trillion* cells, suffice it to say that comparing the size of the Internet to the MentalNet is like comparing a light bulb to the Sun.

And now, the Purpose of Human Existence

John Wheeler was right. We live in a participatory universe. The universe created human beings to help create the universe. We depend upon the universe; the universe depends upon us. We are here to transform Intelligence into Consciousness. But the Information Field of Consciousness is not 'more' or 'greater' Intelligence; it is greater *awareness*. Human beings are meant to create Consciousness by *expanding awareness*. This process has been described throughout the ages by religious and spiritual traditions as 'enlightenment,' but *not* in the sense of the 'age of enlightenment' of the 17th century. In this sense, enlightenment means something entirely different. An enlightenment *experience* can be described as an individual's 'oneness' experience with the universe as a whole. This experience is roughly analogous to the following example: Imagine a computer that could think, was self-aware, and was connected to the Internet at all times. An enlightenment 'experience' for that computer would be if it somehow *merged* with the entire Internet and everything connected to it at once, thus providing it with a direct experience of the 'oneness' of it all. This would also enable to computer to 'know' all of the information the Internet contained. A fully 'enlightened' computer would be one that could merge with the Internet at will, yet retain its individuality.

***"Different people describe the same experiences in remarkably different languages."*¹⁰**

David Finklestein

Many of these same religious and spiritual traditions describe five levels of existence. Although different names such as dimensions, sheaths, layers, bodies, koshas, and others are used to describe them, they all possess similar characteristics. Three of the levels are always described as being unique to the individual – body/physical, mind/mental, soul/spiritual. The other two levels of existence are always described as being universal – a realm of intelligence and/or knowledge and a realm of consciousness and/or awareness. These five levels, by whatever name used to

describe them, *directly correlate with the hardware and software systems of a self-synthesized information system.*

This model of the universe as a self-synthesized information system also sheds new light on the part of the universe that has gone ‘missing.’ It illuminates all 96% of it, accounting for it in a very logical manner as a natural consequence of the system. In order for the system to work properly, the universe must allocate the correct proportion of its total resources to each of its subsystems so that everything balances. For example, the energy system must provide fuel to both the parts *and* the communications systems. So the universe must allocate the same percentage of its total resources to its fuel system as it does to the parts and communications systems *combined*. Likewise, the percentage of its total resources the universe allocates to its system of programming/instructions must equal the same percentage it has allocated to the communications and fuel systems combined. Lastly, the subsystem of execution/awareness must receive the same percentage of the universe’s total resources that the communications, fuel, and programming/instructions systems receive combined. If ordinary matter comprises approximately 4%¹¹ of the universe, the remaining percentages required to balance everything are: Communications – 10%; Fuel – 14%; Programming – 24%; Execution – 48%. ***The hardware systems of communications and fuel equal 24% of the total resources of the universe; they represent the ‘dark matter’ of the universe. The software systems of Intelligence and Consciousness equal 72% of the total resources of the universe; they represent the ‘dark energy’ of our universe.***

The software systems of Intelligence and Consciousness are stored within the fabric of space itself. The variable rate of expansion of space is a result of the natural evolution of the system. The expansion of the universe slows from its inception until the system has had enough time to mature and create enough living things and sentient beings that the conversion of information into software reaches a tipping point. It then reverses from a state of deceleration to acceleration.

There is one remaining obstacle we must overcome to complete our model of the universe as a self-synthesized information system: a survivable environment. A universe that is fine-tuned for the creation of life is not enough; its environment must also be *survivable*. A universe containing only four dimensions is completely *un-survivable*.

“We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances.”¹² Issac Newton

A living thing’s survival often hangs by a string. To survive an environment, a living thing must be capable of perceiving it; however, this alone is not enough. A backdrop against which the environment can *be* perceived must also exist. So the universe must provide its living things with perceivable dimensions. Without them, the universe would be like a giant sensory deprivation tank which would render its living things as senseless as a box of rocks. In addition to providing a survivable environment for its living things, perceivable dimensions also set the stage required in order for them to create decisions. A larger set of dimensions provides a richer decision-making environment which benefits the universe by increasing the size and complexity of its MentalNet more rapidly. By necessity, a universe’s perceivable dimensions must exist

everywhere at all times and be perceivable by the decision-making (i.e. mental) apparatus of the living thing. This means that they must be composed of the smallest possible ‘constituents’ available to the universe, and can be linked together into three-dimensional ‘sheet-like’ screens upon which they can be displayed and perceived by the living thing. What we need is a theory that would require the necessity of these extra dimensions and would account for the five separate, but related Information Fields composed of a single, underlying substance. In fact, the challenges of string theory help confirm this model of our universe as a self-synthesized information system; conversely, this model represents the overarching theory that string theorists have been seeking: **M-Theory**. The five separate, but related string theories match the five Information Fields including the manner in which they transmute into each other. See the diagram below.



The string theory transmutation of Type I to Type HO to Type HE¹³ precisely correlates to the transformation of information from matter to light to energy. The transmutation of Type IIA string theory into Type IIB and Type IIB’s transmutation into *itself*¹⁴ matches the transformation of Intelligence into Consciousness, which reflects back into *itself*.

Coming to our Senses

The 7 additional dimensions string theory requires are the perceivable dimensions a survivable universe requires for living things to exist. These dimensions aren’t hidden; they’re right in front of us. To detect them, we simply need to come to our senses. They are the physical perceptions of: **sight, sound, touch, taste, smell, pleasure, and pain.**

Conclusion

John Wheeler was right. We *can* understand existence – all of us. The central idea of it all *is* simple, beautiful, and compelling. The universe is simple when seen as a whole, beautiful in its design, and compelling when understood. To discover the central idea of the universe is to also discover the purpose of human existence, and to be *compelled* by it. To know that each and every one of us matters to the universe should matter to each and every one of us. We should honor the role the universe has reserved for us by fully stepping into it. When we do, we will truly make ourselves, the world, and the universe as a whole, a better place.

This essay is dedicated to the proposition that all human beings are meant to understand, awaken to, and embrace the purpose of our existence.

* * * * *

“I didn’t come here to tell you how this is going to end. I came here to tell you how it’s going to begin Where we go from there, is a choice I leave to you.”¹⁵

Neo, The Matrix

REFERENCES

1. Wheeler, J A (1990), "Information, Physics, Quantum: The Search for Links", In W. H. Zureck (ed.), *Complexity, Entropy, and the Physics of Information*, Redwood City, CA: Addison Wesley
2. Wheeler, J A (1990), "Information, Physics, Quantum: The Search for Links", In W. H. Zureck (ed.), *Complexity, Entropy, and the Physics of Information*, Redwood City, CA: Addison Wesley
3. Wheeler, J A (1990), "Information, Physics, Quantum: The Search for Links", In W. H. Zureck (ed.), *Complexity, Entropy, and the Physics of Information*, Redwood City, CA: Addison Wesley
4. Einstein, Albert, "Physics and Reality" in the *Journal of the Franklin Institute* Vol. 221, Issue 3 (March 1936)
5. Paul Davies. *Cosmic Jackpot. Why Our Universe Is Just Right for Life*. Houghton Mifflin Company, 7:139-150, 2007.
6. Howard C. McAllister. (2003), "Estimate the number of grains of sand on all the beaches of the earth" Retrieved from <http://hawaii.edu/suremath/jsand>
7. Paul Davies. *Cosmic Jackpot. Why Our Universe Is Just Right for Life*. Houghton Mifflin Company, 7:139-150, 2007.
8. Harvard-Smithsonian Center for Astrophysics, 2013, Press Release No.: 2013-01, "At Least One in Six Stars Has an Earth-sized Planet," January 07, 2013
9. Evans, D. 2011. *The Internet of Things - How the Next Evolution of the Internet is Changing Everything*. [report] Cisco IBSG, p. 3.
10. David Finklestein. *Physical Process and Physical Law*, in an edition by Timothy E. Eastman, Hank Keeton (2004). *Physics and Whitehead: quantum, process, and experience*. SUNY Press. p. 181.
11. Wikipedia.org. 2013. *Observable universe - Wikipedia, the free encyclopedia*. [online] Available at: http://www.wikipedia.org/wiki/observable_universe [Accessed: 16 Jun 2013].
12. Sir Isaac Newton, *The Mathematical Principles of Natural Philosophy*, Book III, Andrew Motte, trans., (London; H. D. Symonds, 1803)
13. Brian Greene. *The Elegant Universe. Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory*. Vintage Books, 12:313, 2000
14. Brian Greene. *The Elegant Universe. Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory*. Vintage Books, 12:313, 2000
15. *The Matrix*. Dir. Andy Wachowski, Lana Wachowski . Perf. Keanu Reeves. Warner Bros. 1999. Film