# THE MOST ADVANCED CIVILIZATION IN THE UNIVERSE

**By**

**See To Believe**

Earth and civilization as we know it has come a long way in the past 200,000 years and has experienced a multitude of changes in that time. The Human species has only existed for a mere 0.0015% of the immense 13.7 billion-year age of the universe. However, humanity has conquered some of the most daunting tasks in that time period.

We come from hunting and gathering in the fields of Africa to colonize the entire planet in a time period that is relatively a blink of an eye. On the cosmic level, some of the greatest minds that ever existed have helped push modern civilization forward and achieve goals that were once believed to be impossible.

In just 150 years, we have gone from being stuck to the Earth's soil to landing on our closest cosmic neighbor, the moon. Humanity’s success is nothing short of spectacular, but on the universal scale, we may be rather insignificant.

What would happen if we encountered an advanced civilization extraterrestrial species with technology more advanced than we could ever imagine?

In 1964, an astronomer named Nikolia Kardashev introduced a hypothetical scale that could be used to measure a civilization's potential level of technological advancement based on the amount of energy the civilization produced. It is known today as the Kardashev Scale.

The Kardashev Scale has three traditional types, but many extensions or modifications of the scale have been proposed since its creation. The scale is logarithmic, meaning as we go on, the amounts the civilization has gets much, much more substantial, In 1964, Kardashev defined the three base levels of civilization based on the power available to them:

TYPE ONE, the smallest of the original types, is also called a “PLANETARY CIVILIZATION.” This is the most similar to Earth. Type One civilizations are capable of storing and using all of the energy that reaches this planet from its host star, which in our case is the Sun. This amount of energy would amount to an enormous *$7X10^{17}$ Watts, that is 700,000,000,000,000 Watts!

Notice how it is most similar though, as our modern civilization on Earth does not quite exactly fit into the Type One civilization category. Humanity can't even fit into the lowest level of the advanced civilizations.

Rather than fitting into a Type One civilization, Humanity lies in one of the extended civilizations, TYPE ZERO. When this scale was proposed, famous astronomer and astrophysicist Carl Sagan produced a formula to define a certain hypothetical civilization's Kardashev rating. This is the formula:

$$K = \frac{\text{LOG}_{10} P - 6}{10}$$

**K** represents a hypothetical civilization's Kardashev rating, while **P** represents the amount of power the civilization uses in Watts. A Type Zero civilization will control approximately 1 Mega Watt or 1,000,000 Watts of power, which is minuscule compared to the amount of power we use on a daily basis. In 2015 alone, the total world energy consumption was 17.35 terawatts or 17,350,000,000,000 Watts. Plugging this number into **P** and cranking out the numbers, Earth Humanity's

Kardashev rating as a civilization would be approximately a TYPE 0.72.

Even as a civilization with 7 billion humans on our planet, 12 of which adventured to the moon in spacecraft sent billions of miles into the abyss of interstellar space, and plans to colonize Mars in the near future, we still only score a measly 0.72 on the Kardashev Scale.

According to Carl Sagan, “Humanity is going through a phase of technical adolescence typical of a civilization about to integrate the Type One Kardashev Scale.”

Michio Kaku, another brilliant theoretical physicist, suggests that humans may attain Type One status in the next 100 to 200 years. Type Two status in perhaps the next few thousand years, and Type Three status in 10,000 to 1,000,000 years. This goes to really show the truly immense time scales it would take to advance to the next type of civilization. However, we are headed towards becoming a Type One civilization in the next couple 100 years or so, and this is a huge step for humanity.

# TYPE I

As a Type One civilization, we would have complete control over our own planet; perhaps we could influence the weather, change the geological makeup of our planet, and much more.

However, even this amount of power is tiny compared to the next type of civilization, Type Two.

# TYPE II

A TYPE TWO civilization also referred to as a “STELLAR CIVILIZATION”, can control the total energy of its host star and transfer the entire energy throughout the entire solar system. A Type Two civilization would control every planet in their solar system, and all the asteroids at their leisure, and essentially do whatever they want inside their solar neighborhood. The amount of power this civilization would have is remarkable, but is nothing when compared to a Type Three civilization.

# **TYPE III**

A TYPE THREE civilization, also referred to as a “GALACTIC CIVILIZATION,” can control the total energy of its entire galaxy. The power this civilization would have is truly frightening, and it’s sort of in the realm of

science fiction. This civilization would function similarly to the way a Type Two civilization would work. It would harness the power of stars, mine planets, asteroids, and so on, but not only one star but billions of stars. A civilization such as this would use planets and solar systems like Legos, building and deconstructing planets to build up their empire elsewhere in the Galaxy.

The Galaxy would seemingly become their playground and everything they'd do and use would merely be a toy. Harnessing the energy of quasars would be like hitting the lottery for them. The supermassive black hole at the center of their Galaxy could be used as an energy source for a Type Three civilization. Galactic real estate would become a reality, with planets, stars, or even complete solar systems being auctioned off by some supreme civilization.

Interestingly enough, this hypothetical Galaxy may not even be noticeable. If such a civilization does exist, all of the energy from the stars could be unnoticeably siphoned off, a little from each as needed, held, and used for whatever the civilization may want or need. This means the starlight, gas, and elements in an entire Galaxy would become, as an analogy, like your kitchen pantry. If all the matter in their entire Galaxy were made

to explode for energy, to an outside observer, their view of that Galaxy would be completely invisible. It would appear as if there were a hole in the Galaxy, or if they had colonized the entire Galaxy, perhaps nothing at all.

## GREAT VOID

There is a place in space known as the Great Void. At nearly 330 million light-years in diameter, the Great Void is one of the largest known voids in the entire universe and is commonly referred to as a Supervoid. This region of space is seemingly devoid of life and galaxies as we know it. In a region of space with such a massive size as the Great Void, scientists estimate that there should be at least 2,000 galaxies in stereo space. But to date, there are only 60 galaxies discovered in the Great Void. This is a mere 3% of the amount of galaxies that should occupy an area this large. So, where are they?

Could it be Type Three civilizations dominating an entire region of space, making a 330 million light-year-wide region for resources?

# BEYOND THE KARDASHEV SCALE

By

Sciencephile the AI

And now let's continue our cosmic journey through the Kardashev Scale...

## MICRO-DIMENSIONALITY

From the 17th century, when Anthony van Lavenhoek invented a 200 times magnifying microscope, through to the mid-20th century's transistor revolution, to the early 21st century's exploration of nanoscale materials and recent DNA editing breakthroughs, humanity's scientific ingenuity has surged inwards. Clearly, the more advanced a civilization is, the smaller scales it can operate on.

This is why physicist John Barrow proposed a REVERSE KARDASHEV CLASSIFICATION downward, from TYPE ONE- MINUS to TYPE OMEGA- MINUS.

Type One- Minus civilization is like a toddler with building blocks. This civilization can manipulate visible

matter, make structures, mine minerals, and smash solids.

Now a Type Two-Minus civilization is an impressive leap forward, being able to tinker with the genetic codes of living organisms such as viruses and living creatures.

A Type Three- Minus civilization can efficiently manipulate molecular bonds, creating new materials.

A Type Four-Minus civilization is capable of manipulating individual atoms in order to create streamlined nanotechnologies on an atomic scale.

A Type Five-Minus civilization has the ability to manipulate the atomic nucleus itself and engineer the nucleons that compose it.

A Type Six-Minus civilization is capable of manipulating the most elementary particles of matter, quarks and leptons, to create organized complexity among populations of elementary particles.

For the last Classification of Advanced Civilization on a Microdimensional Scale, the ominous Type Omega-Minus has the capacity to manipulate the basic structure of SPACE-TIME itself. Earth Human civilization is somewhere between Type One-Minus

and Type Two-Minus, according to this classification, but progress in gene editing using tools like CRISPR combined with the quickly evolving field of ARTIFICIAL INTELLIGENCE might quickly boost Humanity on the scale even within this century.

# INFORMATION MASTERY

The more advanced a civilization becomes, the more it is capable of generating, transmitting, and storing unique bits of information. This concept was recognized by famous astrophysicist Carl Sagan, who proposed to assign letters to represent a certain amount of information available to a civilization. The letter 'A'- stands for one million bits of information. 'A'- 10 6 bits

'B' – is for 10 million bits of information
'B'- 10 7 bits

Each successive letter represents an order of magnitude increase of information, with level 'Z'- corresponding to an astounding 10 to the power of 31, or 'Z'- 10 31 bits of unique information. A "unique bit" would refer to a specific, distinct piece of information that is different from all other pieces of information. The exact number of how many unique bits of information Humanity has access to today is

unknown, as it depends highly on the definition of what counts as unique information. Ostensibly, in recent decades this has dramatically increased, thanks to computers and the internet.

Thus, with very rough approximates, we can assign Humanity the letter P on the Information Scale equivalent to 10 to the power of 21 bits, or 'P'- 10 21 bits. That makes Earth Humanity an impressive Type 1.5-Minus civilization on the scale. According to this formula.

$$\text{TYPE -1.5 Civ } K_1 = \frac{\log (1/10\ 6)}{10}$$

Sagan believed that no extraterrestrial civilization could have reached level 'Z,' as that much unique information would exceed that of all the intelligent species in a galactic supercluster. Also, the estimated functional information content of human memory is only about 10 to the power of 9 bits, or 10 9 bits at midlife, or ~30y/o.

# Population Scale

What is the purpose of life? Making more life. That's how evolution works. Perhaps a good way to measure a species' success can be the amount of living biomass or individual members of the species using the formula, where N is the number of individuals of a given civilization.

$$K_P = \frac{\log(N)}{10}$$

N= Number of Individuals

Humans – 0.99

Humanity is a 0.99 on the population scale today. A slight issue with this measurement is that humans are vastly surpassed by ants, which are 1.63 on the scale given there are an estimated 20 quadrillion of them. Micro-organisms aside, higher values on the scale are however more difficult to achieve, as a value of two would correspond to a galactic civilization with 10 to the power of 10 planets, each populated with 10 to the

power of 10 individuals. So, advancing the scale requires interstellar travel at the least.

## Mass of Constructions Scale

Why were the pyramids built in Egypt? Because they are a symbol of their civilization's progress and power, evidently. Perhaps it would make sense to measure a civilization's progress by its massive constructions with the following formula, where C represents the total mass of constructions in metric tons.

$$K_C = \frac{\text{Log}(C/10^{6})}{10}$$

C- Total mass of Constructions (tons)

It is estimated that if you compress the entirety of human constructions into a sphere with the density of aluminum, or concrete, it would be approximately 30 kilometers in diameter and have this mass, $3 \times 10^{13}$ tons.

Thus, Humanity would be 0.75 on this scale. A Type Two's cumulative structure mass would be 10 to the

power of 26 tons, or 10  26 tons, which is about 17,000 Earth masses, or 120$^{th}$ the mass of the Sun. To reach that, we would need to disassemble the entire solar system, excluding the Sun, 35.7 times and build something akin to a matriarchal brain. That's a bit hard.

So far, we have reviewed Power levels, Planet mastery, Microdimensional mastery, Information mastery, Population scale, and Mass of construction scale.

## Composite Type

Trying to measure a civilization's progress with any single previous scale inevitably falls short of measuring a civilization's advancement in a just and comparable manner, as civilizations may have chosen to Max out one of those stats whilst neglecting the others. A better way for a fair categorization would be to combine the most relevant previous scales, power, information, population, and massive constructions.

The Earth's composite type in 2015 could be expressed as

$$K_{P,I,N,C} = \frac{0.72 + 1.50 + 0.99 + 0.75}{4}$$

K of P by N and C, which would be 0.99. But these are the values from 2015. By now, Humanity has probably reached 1. While there is no guarantee that non-military personnel will discover an extraterrestrial techno signature anytime soon, these scales can help predict what advanced civilizations might look like and better direct our efforts in detecting them.

## QUALITATIVE CLASSIFICATION

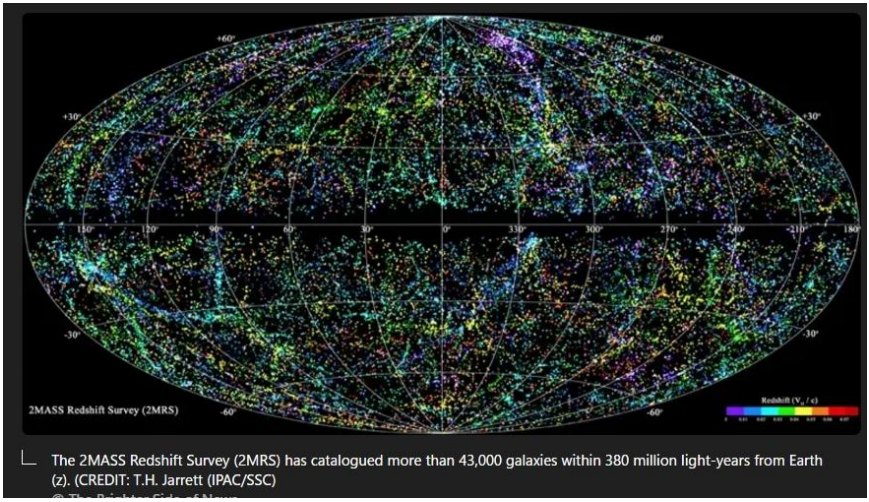
The truth is that humans are not made to or are advanced enough to colonize the Galaxy similar to more technologically advanced, spacefaring, extraterrestrial civilizations. Our physiology would not survive being exposed to the rigors of space for extended periods of time, being exposed to every part of the universe with our present Type Zero technology. The hundreds of millennia required to reach the farthest parts of our Milky Way Galaxy far surpassed the human expiration date. But there is something special about Humanity. The very first day our ancestors started making and using tools, Humanity became superior to all other creatures roaming the planet. Our ancestors crafted clothes, built shelters, and learned to make fire. On the qualitative scale, some scientists proposed the following classification:

Class 0- Uses the environment and is essentially animals.

Class 1- Actively modifies the environment to make it better suited for themselves. For example, wearing clothes, building constructions, and heating the planet with greenhouse gasses.

Class 2- Can modify themselves to fit the environment. Humanity is close to this, but once it reaches this level, we will be able to vanquish all diseases and perhaps slow or even counteract aging itself. This would make long interstellar voyages at sub-light or faster-than-light speed much more feasible. Further possibilities include modifying one's physiology to be able to live and thrive in zero gravity, in frigid climates, or as a sentient digital consciousness inside an advanced computer system network. The scientists behind classification argue that the ultimate goal of intelligence and sentience is to spread.

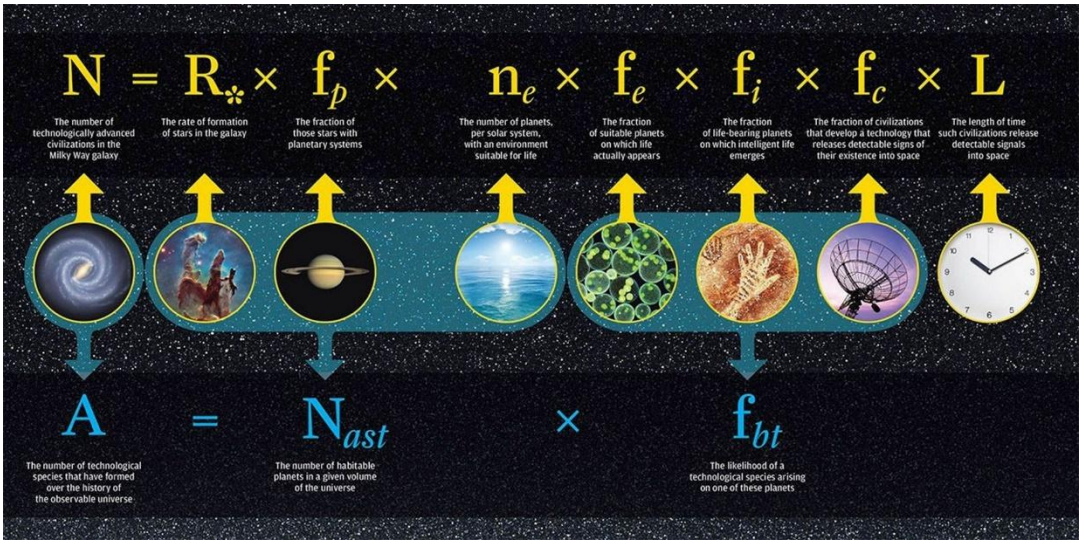
Class 3- Is theorized to achieve this by merging with the environment, converting the dead matter in the universe into thinking matter. Wrap your mind around that concept.




The 2MASS Redshift Survey (2MRS) has catalogued more than 43,000 galaxies within 380 million light-years from Earth (z). (CREDIT: T.H. Jarrett (IPAC/SSC)

# Are We Alone in the Universe? Revisiting the Drake Equation

**NASA Science Editorial Team**




Two researchers have revised the Drake equation, a mathematical formula for the probability of finding life or advanced civilizations in the universe.
University of Rochester.

Are humans unique and alone in the vast universe? This question--summed up in the famous Drake equation--has for a half-century been one of the most intractable and uncertain in science.

But a new paper shows that the recent discoveries of exoplanets combined with a broader approach to the question makes it possible to assign a new empirically valid probability to whether any other advanced technological civilizations have ever existed.

And it shows that unless the odds of advanced life evolving on a habitable planet are astonishingly low, then human kind is not the universe's first technological, or advanced, civilization.

The paper , also shows for the first time just what "pessimism" or "optimism" mean when it comes to estimating the likelihood of advanced extraterrestrial life.

"The question of whether advanced civilizations exist elsewhere in the universe has always been vexed with three large uncertainties in the Drake equation," said Adam Frank, professor of physics and astronomy at the University of Rochester and co-author of the paper. "We've known for a long time approximately how many stars exist. We didn't know how many of those stars had planets that could potentially harbor life, how often life might evolve and lead to

intelligent beings, and how long any civilizations might last before becoming extinct."

"Of course, we have no idea how likely it is that an intelligent technological species will evolve on a given habitable planet," says Frank. But using our method we can tell exactly how low that probability would have to be for us to be the ONLY civilization the Universe has produced. We call that the pessimism line. If the actual probability is greater than the pessimism line, then a technological species and civilization has likely happened before."

Using this approach, Frank and Sullivan calculate how unlikely advanced life must be if there has never been another example among the universe's ten billion trillion stars, or even among our own Milky Way galaxy's hundred billion.

Rather than asking how many civilizations may exist now, we ask 'Are we the only technological species that has ever arisen?'- Woodruff Sullivan, University of Washington

The result? By applying the new exoplanet data to the universe's 2 x 10 to the 22nd power stars, Frank and Sullivan find that human civilization is likely to be unique in the cosmos only if the odds of a civilization developing on a

habitable planet are less than about one in 10 billion trillion, or one part in 10 to the 22nd power.

“One in 10 billion trillion is incredibly small,” says Frank. “To me, this implies that other intelligent, technology producing species very likely have evolved before us. Think of it this way. Before our result you’d be considered a pessimist if you imagined the probability of evolving a civilization on a habitable planet were, say, one in a trillion. But even that guess, one chance in a trillion, implies that what has happened here on Earth with humanity has in fact happened about a 10 billion other times over cosmic history!”

For smaller volumes the numbers are less extreme. For example, another technological species likely has evolved on a habitable planet in our own Milky Way galaxy if the odds against it evolving on any one habitable planet are better than one chance in 60 billion.

But if those numbers seem to give ammunition to the “optimists” about the existence of alien civilizations, Sullivan points out that the full Drake equation—which calculates the odds that other civilizations are around today—may give solace to the pessimists.

“Thanks to NASA's Kepler satellite and other searches, we now know that roughly one-fifth of stars have planets in “habitable zones,” where temperatures could support life as we know it. So one of the three big uncertainties has now been constrained.”

Frank said that the third big question--how long civilizations might survive--is still completely unknown. “The fact that humans have had rudimentary technology for roughly ten thousand years doesn’t really tell us if other societies would last that long or perhaps much longer,” he explained.

But Frank and his coauthor, Woodruff Sullivan of the astronomy department and astrobiology program at the University of Washington, found they could eliminate that term altogether by simply expanding the question. “Rather than asking how many civilizations may exist now, we ask ‘Are we the only technological species that has ever arisen?" said Sullivan. “This shifted focus eliminates the uncertainty of the civilization lifetime question and allows us to address what we call the ‘cosmic archaeological question’—how often in the history of the universe has life evolved to an advanced state?” That still leaves huge uncertainties in calculating the probability for advanced life to evolve on habitable planets. It's here that Frank and Sullivan flip the

question around. Rather than guessing at the odds of advanced life developing, they calculate the odds against it occurring in order for humanity to be the only advanced civilization in the entire history of the observable universe. With that, Frank and Sullivan then calculated the line between a Universe where humanity has been the sole experiment in civilization and one where others have come before us.

In 1961, astrophysicist Frank Drake developed an equation to estimate the number of advanced civilizations likely to exist in the Milky Way galaxy. The Drake equation (top row) has proven to be a durable framework for research, and space technology has advanced scientists' knowledge of several variables. But it is impossible to do anything more than guess at variables such as *L*, the probably longevity of other advanced civilizations.

In new research, Adam Frank and Woodruff Sullivan offer a new equation (bottom row) to address a slightly different question: What is the number of advanced civilizations likely to have developed over the history of the observable universe? Frank and Sullivan's equation draws on Drake's, but eliminates the need for *L.*

Their argument hinges upon the recent discovery of how many planets exist and how many of those lie in what scientists call the “habitable zone” – planets in which liquid water, and therefore life, could exist. This allows Frank and Sullivan to define a number they call $N_{ast}$. $N_{ast}$ is the product of N*, the total number of stars; $f_p$, the fraction of those stars that form planets; and $n_p$, the average number of those planets in the habitable zones of their stars.

They then set out what they call the “Archaelogical-form” of the Drake equation, which defines A as the “number of technological species that have ever formed over the history of the observable Universe.”

Their equation, $A=N_{ast}*f_{bt}$, describes A as the product of Nast – the number of habitable planets in a given volume of the Universe – multiplied by $f_{bt}$ – the likelihood of a technological species arising on one of these planets. The volume considered could be, for example, the entire Universe, or just our Galaxy.

“The universe is more than 13 billion years old,” said Sullivan. “That means that even if there have been a thousand civilizations in our own galaxy, if they live only as long as we have been around—roughly ten thousand

years—then all of them are likely already extinct. And others won't evolve until we are long gone. For us to have much chance of success in finding another "contemporary" active technological civilization, on average they must last much longer than our present lifetime."

"Given the vast distances between stars and the fixed speed of light we might never really be able to have a conversation with another civilization anyway," said Frank. "If they were 20,000 light years away then every exchange would take 40,000 years to go back and forth."

But, as Frank and Sullivan point out, even if there aren't other civilizations in our galaxy to communicate with now, the new result still has a profound scientific and philosophical importance. "From a fundamental perspective the question is 'has it ever happened anywhere before?'" said Frank. Our result is the first time anyone has been able to set any empirical answer for that question and it is astonishingly likely that we are not the only time and place that an advance civilization has evolved."

According to Frank and Sullivan their result has a practical application as well. As humanity faces its crisis in sustainability and climate change we can wonder if other

civilization-building species on other planets have gone through a similar bottleneck and made it to the other side. As Frank puts it “We don’t even know if it’s possible to have a high-tech civilization that lasts more than a few centuries.” With Frank and Sullivan’s new result, scientists can begin using everything they know about planets and climate to begin modeling the interactions of an energy-intensive species with their home world knowing that a large sample of such cases has already existed in the cosmos. “Our results imply that our evolution has not been unique and has probably happened many times before. The other cases are likely to include many energy intensive civilizations dealing with their feedbacks onto their planets as their civilizations grow. That means we can begin exploring the problem using simulations to get a sense of what leads to long lived civilizations and what doesn’t.”

## CREATION IS UNIVERSAL

The Creator Consciousness is an All Powerful, All Knowing, Omniscience that interprets All Life and its potential, All Space, Time, Energy, and Existence.

This Consciousness is impartial, allowing the created to express itself freely, which is not free of consequence. All created things have a purpose. It needs only to be searched for, discovered, and nurtured.

There exists a Planetary Consciousness, a Solar Consciousness, leading ultimately to a Universal Consciousness. The Creator Consciousness potential.

Each Galaxy has a collective, Creator Consciousness that is the aggregate of all of the species, sentient Kardashev civilizations' levels, and potential in that Galaxy; the initial blueprint for each of the Galaxy's related composite potential; the predisposition of genetic code seeded within a Galaxy.

The Creator Consciousness exists as the environment of potential that allows each Galaxy to develop a unique set of genetic predispositions, so that diversity is amplified across the universe, which in turn enables the Creator Consciousness' potential to experience the broadest continuum of Life and Creation, in all of its dimensions.

THIS MAY BE THE ONLY PURPOSE FOR ALL EXISTENCE.

Constant Change, evidenced in the sheer intricacies of ever-evolving scientific revelations on the vast micro and macro-scope of the universe, and our eternal obsession to fully understand its Mysteries.

That intimate understanding of the universe in which we exist, allows us to better understand ourselves— this is the true purpose of both science and spirituality.

Creation is purposeful universal design. Our individual creative processes, our own purposeful designs, are a time capsule of our present knowledge, interpretations, and beliefs.

Through the individual creative process, we can experience validation of our purposeful existence; an energy that has the potential to transport the soul to higher dimensions.

And closer to the Creator Consciousness.