

信じる理由

神の存在に関するクリスチャンサイエンティストの説明のレイマンの解説*

エリセア・サントス**

Reasons to Believe:

A Layman's Exposition of Christian-Scientists' Accounts on the Existence of God

Elisea SANTOS**

Keywords: Bible, God, Christian, Science, Theist

I. Introduction

“Now faith is confidence in what we hope for and assurance about what we do not see. This is what the ancients were commended for. By faith we understand that the universe was formed at God’s command, so that what is seen was not made out of what was visible.” (Hebrews 11: 1-3, The Holy Bible, NIV, 1984)

This is Christian theist faith. A *theist* is a person who believes in the existence of a god or gods, specifically, of a creator who created the universe and intervenes in it. Theism and science may be two sides of the human desire and instinct to understand the world and the seemingly infinite cosmos. *Cosmos*, in astronomy, is the entire physical universe considered as a unified whole (from the Greek *kosmos*, meaning “order,” “harmony,” and “the world”). (*Cosmos*, Britannica, 2009). *Cosmos* is used to refer to objects that exist naturally especially those that can be seen in the sky.

Atheists, skeptics and even some religious practitioners maintain that a universe created by God cannot be proven or reconciled with scientific knowledge. These people generally believe that science and theism are incompatible.

Numerous study and writings of esteemed Christian scientists in the distant and recent past and today have disputed this belief. In the past centuries up to this day and age, science

and faith and their compatibility were a matter of contention. But still, there were (and still are) serious Christians at the core of the scientific sphere, arguing for the certainty of a Creator God.

Numerous scientists who believe in God as the designer, creator and active force in the universe, have articulated persuasively about their faith and convictions.

Lord Kelvin (William Thomson, Baron Kelvin, 1824-1907), whose name is memorialized in the Kelvin unit of temperature declared in a speech to the Christian Evidence Society, of which he was president; “I have long felt that there was a general impression in the non-scientific world, that the scientific world believes science has discovered ways of explaining all the facts of nature without adopting any definite belief in a creator. I have never doubted that that impression was utterly groundless.” (Twelfth Report of the Committee of the Christian Evidence Society London: G. Norman and Son, 1883)

Michael Faraday (1721-1867), most famous for his contributions to the understanding of electricity and electrochemistry, said, “I cannot doubt that a glorious discovery in natural knowledge, and the wisdom and power of God in the creation, is awaiting our age, and that we may not only hope to see it, but even be honored to help in obtaining the victory over present ignorance and future knowledge.” (The Life and Letters of Faraday, vol. 2, 1870)

Anthony Hewish (1924-2021), a British radio

* Received September 30, 2022

** 鎮西学院大学 現代社会学部 外国語学科

Nagasaki Wesleyan University, Faculty of Contemporary Social Studies, Department of Foreign Languages

astronomer who won the Nobel Prize for Physics in 1974 for his role in the discovery of pulsars, wrote in his introduction to John Polkinghorne's 2009 *Questions of Truth*, "The ghostly presence of virtual particles defies rational common sense and is non-intuitive for those unacquainted with physics. Religious belief in God, and Christian belief ... may seem strange to common-sense thinking. But when the most elementary physical things behave in this way, we should be prepared to accept that the deepest aspects of our existence go beyond our common-sense understanding." (*Questions of Truth: Fifty-One Responses to Questions about God, Science, and Belief*. 2009).

More currently, Francis Collins (born 1950), who directs the U.S. National Human Genome Research Institute and was head of the first team to map the entire human genome and an example of a highly visible and respected scientist who also openly embraces a religious Christian faith wrote in his book, *The Language of God: A Scientist Presents Evidence for Belief*, "In my view, there is no conflict in being a rigorous scientist and a person who believes in a God who takes a personal interest in each one of us. Science's domain is to explore nature. God's domain is in the spiritual world, a realm not possible to explore with the tools and language of science. It must be examined with the heart, the mind, and the soul." (*The Language of God: A Scientist Presents Evidence for Belief* 2007)

Even the most famous scientist of them all, Albert Einstein (1879-1955) once wrote in an essay titled, *Science and Religion*, "Science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs forth from the sphere of religion... The situation may be expressed by an image, science without religion is lame, religion without science is blind." (*Ideas and Opinions*, New York: Dell, 1973)

This paper will introduce a few Christian scientists who have dwelt in studies and writings that reconcile science with a God-

created universe. It will mainly focus on scientific facts and constants that may very well validate the Christian faith and the Bible.

There are many arguments for the existence of God, such as moral, logical, empirical, metaphysical, subjective and scientific arguments. This paper would present scientific arguments by well-regarded scientists focusing on the "Fine-Tuned" Universe or a "Just-Right" Universe and the compatibility of Science and the Christian faith.

The impetus to write this paper was brought about by the author's Christian faith and her undergraduate study in Electrical Engineering. Having read the books and followed internet media sites and posts of the Christian scientists (to be named later in this paper), the author wanted to share her learnings, albeit not as eloquently, but in more understandable terms for readers who have either or neither deep backgrounds in Christianity and Science. This is a humble, novice attempt in apologetics.

II. The Universe is Designed for Life

Paraphrasing from "The Fine-Tuning of the Universe as Evidence of God" a YouTube video and article of the same title in a pursue.org article. (*The Fine-Tuning of the Universe*, 2016)

The very foundation and structure of the universe is determined and maintained by the fundamental forces, constants and quantities discovered by scientists. More than a hundred different parameters or factors for the universe must have values falling within narrowly defined ranges for physical life of any kind to subsist. This means that these forces are fine-tuned for life to thrive and for the universe itself to exist.

There are three posited explanations for this phenomenon.

1. *Fine-tuning was a Physical Necessity*

This suggests that the universe MUST be life permitting. Necessity or requirement says that the universe can only exist as it does. But a life-prohibiting universe is possible. Not only is it possible, it is far more likely or probable than a life-permitting universe. The constants and

quantities of the fundamental forces are not determined by the laws of nature – they don't have to be “dialed” as they are – so there is no evidence suggesting that fine-tuning is necessary. The universe did not have to exist as it does, and statistically, it should not.

2. *Fine-tuning was by Chance*

Chance says that random or arbitrary factors merged to form the universe and everything in it as they are. Because this is statistically impossible, some have speculated a multiverse theory. They imagine a type of “universe generator” that creates universes infinitely. If this occurred infinitely, eventually a universe that is “fine-tuned” for life would come about. There is no scientific evidence for a multiverse. It cannot be detected, observed, measured, or proved. And the “universe generator” itself would require an enormous amount of fine-tuning. In that case, one has to go back to the question of where did that fine-tuning come from and return to the original problem.

To explain further, Fred Hoyle, an Astrophysicist and cosmologists, Plumian Professor of Astronomy and Experimental Philosophy of Cambridge and N. Chandra Wickramasingh wrote “Once we see, however, that the probability of life originating at random is so utterly minuscule as to make it absurd, it becomes sensible to think that the favorable properties of physics on which life depends are in every respect deliberate ... It is therefore almost inevitable that our own measure of intelligence must reflect ... higher intelligences ... even to the limit of God ... such a theory is so obvious that one wonders why it is not widely accepted as being self-evident. The reasons are psychological rather than scientific.” (Evolution from Space, 1981)

3. *Fine-tuning was by Intentional and Intelligent Design*

Fine-tuning by intentional and intelligent design is the simplest explanation for why the universe is fine-tuned for life. As numerous scientists calculated facts and parameters, they found out that there were no blind forces about nature.

Paul Davies, a physicist and a recipient of the Templeton Prize, the Kelvin Medal from the UK Institute of Physics and the Michael Faraday Prize also said “There is for me a powerful evidence that there is something going on behind it all...it seems as though somebody has fine-tuned nature's numbers to make the universe. The impression of design is overwhelming.” (The Cosmic Blueprint: New Discoveries In Nature's Creative Ability To Order Universe, 1988)

The universe, according to many physicists, is finely-tuned to exist and sustain life. The doctrine of the fine-tuned universe states that even a very small change in any or several of the physical constants in the universe would make the world drastically different such that it would not be as it is and may not be able to maintain life. It is only able to support life because of its fundamental constant and precise characteristics.

These are characteristics are:

- a. on the form of the laws of nature,
- b. on the values of some constants of nature,
- c. and on properties of the universe's conditions in its primary stages.

Theist attributes this fine-tuning to intentional planning and intelligent design by an omniscient and omnipotent God. The supernatural God designed the universe so precisely to sustain life.

Before Christian scientists' views are presented, it would be prudent as well, to present the views of two famous scientists who are avowed atheists on the fine-tuned universe.

1. *Sir Martin Rees*

Sir Rees is Britain's Astronomer Royal and Royal Society Research Professor at Cambridge University, a cosmologist (scientist who study the entire universe, its creation, evolution, and possible future) and astrophysicist wrote “Just Six Numbers: The Deep Forces that Shape the Universe”. The six numbers he presented and expounded on encompass exactly the values necessary for all life forms to exist on the

universe.

Peter Roberts in his review summarizes these six numbers:

1. The letter N , this is the ratio of the strength of the electrical force to the gravitational force.

Rees states that if this number were just slightly smaller, stars would have much reduced life cycles: the balance between the gravitational forces pulling stars together and the electrical forces stopping them from collapsing is closely related to the longevity of stars. Without this fine balance we could not expect planets like Earth to have had time to develop. Even the most optimistic of evolutionary theories maintains that life can only arise after a vast amount of time. Without a stable sun to orbit around, the existence of Earth, or life on it, would be highly improbable.

2. Rees's second number, ϵ (epsilon), defines how strongly atomic nuclei bind together. This factor governs the power output from stars and affects the type and abundance of elements that are produced within them. If this number were just slightly different, the chemical abundance in the universe would be radically altered, preventing the existence of the type of life we see on Earth.

3. The third number, Ω (omega), measures the amount of material in the universe.

If this number had been too high, the universe would have collapsed upon itself long ago, all the matter in the universe being drawn back into a single point—a “big crunch.” If it had been too low, stars and galaxies would never have formed. What matter there is would have been scattered thinly across the depths of space. Yet what Rees found is that the initial expansion speed of the universe and the amount of material within it appear to have been finely tuned to promote a long-lived and stable universe suitable for the development and sustaining of life.

4. His fourth number, λ (lambda), has only

resurfaced in scientific thought within the last few years. It relates to an assumed antigravity effect that modifies the rate of expansion of the universe to explain recent astronomical observations. Einstein initially calculated such a force into his general theory of relativity to predict a stable universe, but he later reckoned that the addition of this “cosmological constant” was the biggest mistake of his life. Ironically, many cosmologists now think he may have been right after all. Rees points out that, fortunately for us, the value of the number is extremely small. If it were not, it would have stopped galaxies and stars from forming and, once again, we would not exist.

5. The fifth number, represented by the letter Q , relates to the degree of structure in the universe. This number, too, seems to have been imprinted into the early universe in the big bang, and it, too, appears to be carefully balanced to allow life to exist.

If this number were only slightly smaller, the universe would be inert and would lack structure. A little larger, and the universe would be too violent for stars or solar systems to survive. Instead, it would be dominated by vast black holes.

6. The sixth number, represented by the letter D , is a simple one that has been known for centuries. It is the number of *spatial* dimensions we live in and is equal to three: height, width and depth.

If the universe we lived in had four spatial dimensions, many of the laws of nature would have to be rewritten. Life in the forms we know it just could not have originated.

All six numbers, which relate only to cosmology and not to any of the other physical sciences that have a bearing on the existence of human life, appear to be perfectly tuned for just that purpose. That the fine-tuning is present is undisputed by the scientific world in general. But is this just coincidence, or is it divine providence or something else altogether?

He (Rees) asks not from a religious viewpoint but from the perspective of a scientist amazed at the level of organization in the universe and at the same time baffled as to the cause of this order.

He considers six “cosmic numbers” that have determined the way the universe is today. According to Rees, these numbers govern the shape, size and texture of the universe and would have been defined during the big bang. His astonishing conclusion, based on the scientific evidence available, is that these six numbers appear to be unerringly tuned for the emergence of life. That is to say, if any one of them were much different, we simply could not exist. (Just Six Numbers, 2001)

2. *Stephen Hawking*

Stephen Hawking was an English theoretical physicist, cosmologist, and author who, at the time of his death, was director of research at the Centre for Theoretical Cosmology at the University of Cambridge. He is perhaps one of the most recognizable scientist of this age, Hawking holds an iconic status not only in science but also in popular culture.

Hawking noted, “The remarkable fact is that the values of these numbers (i.e. the constants of physics) seem to have been very finely adjusted to make possible the development of life”. “For example,” Hawking writes, “if the electric charge of the electron had been only slightly different, stars would have been unable to burn hydrogen and helium, or else they would not have exploded. It seems clear that there are relatively few ranges of values for the numbers (for the constants) that would allow for development of any form of intelligent life. Most sets of values would give rise to universes that, although they might be very beautiful, would contain no one able to wonder at that beauty.”

Hawking then goes on to say that he can appreciate taking this as possible evidence of “a divine purpose in Creation and the choice of the laws of science (by God).” (A Brief History of Time, 1988)

III. Evidence for God in Science

The expositions presented henceforth were culled and quoted from Christian-scientists whose books were read by the author.

A. *Hugh Norman Ross*

Hugh Norman Ross is a Canadian astrophysicist, Christian apologist, and old-Earth creationist. Ross obtained his Ph.D. in Astronomy from the University of Toronto and his B.Sc. degree in Physics from the University of British Columbia. After five years on the Caltech faculty, he transitioned to full-time ministry and still serves on the pastoral team at Christ Church Sierra. Hugh Ross is senior scholar and founder of Reasons to Believe, an organization dedicated to communicating the compatibility of science and the Christian faith.

His organization was the inspiration of the author’s paper, thus its inclusion in this research title. No infringement or association is meant by the author in this paper.

A “Just-Right” Universe

From Ross’ book, *The Creator and the Cosmos: How the Latest Scientific Discoveries Reveal God*, he enumerates the four major building blocks designed “just-right” for life:

1. Getting the Right Molecules

For life to be possible, more than 40 different elements must be able to bond together to form molecules. Molecular bonding depends on two factors, the strength of the force of electromagnetism and the ratio of the electron mass to the proton mass.

If the force of electromagnetism was larger no sharing of electrons with other atoms would happen. If this force is weaker, atoms would not hang on to the electrons. If molecules are to exist, the electromagnetic force should be delicately balanced.

The size and stability of electron orbits around the nuclei of atoms depend on the ratio of the electron mass to proton mass. Unless this ratio is also delicately balanced, the chemical bonding essential for life chemistry could never take place.

2. Getting the Right Atoms

Life molecules cannot result unless sufficient quantities of the elements essential for life are available, which means atoms of various size must be able to form. For that to happen, a delicate balance must exist among the constants of physics that govern the strong and weak nuclear forces, gravity and the nuclear ground state energies for several key elements.

A very important element in life chemistry is hydrogen.

3. Getting the Right Nucleons

Nucleons are protons and neutrons. The universe must be fine-tuned to get enough nucleons to form the elements.

The neutron is 0.138% more massive than a proton. Because of this extra mass, neutrons require slightly more energy to make protons. So as the universe cooled from the hot big bang creation event, it produced seven times more protons than

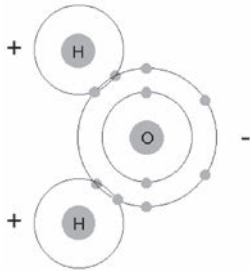
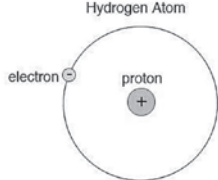
neutrons.

If the neutron were just another 0.1 % more massive, so few neutrons would remain from the cooling off of the big bang that there would not be enough of them to make the nuclei of all life-essential heavy elements.

4. Getting the Right Electrons

The universe must also be fine-tuned to get the precise number of electrons to exist. Unless the number of electrons is equivalent to the number of protons to an accuracy of one part in 10^{37} or better, electromagnetic forces in the universe would have overcome gravitational forces so the galaxies, stars and planets never would have formed. (The Creator and the Cosmos, Fourth Edition, 2018, p168-172)

To simplify Ross four major building blocks designed “just right” for life, the table below is proposed.

Building blocks for life to exist	Properties and creation of the building blocks
<p>1. Right Molecules example, H₂O (water)</p>	<p>Bonding (sticking) of elements. Elements consist of atoms, atoms are made up of the nucleus with its neutrons (no charge) and protons (+) and the electrons (-)</p> <p>For the elements (i.e. Hydrogen and Oxygen) to bond (becoming H₂O) there has to be an exact strength of the force of electromagnetism and ratio of the electron mass to the proton mass.</p> <div style="text-align: center;">  <p>The diagram shows two hydrogen atoms on the left, each with a nucleus labeled 'H' and a single electron shell. In the center is an oxygen atom with a nucleus labeled 'O' and two electron shells. Lines connect the outer shells of the hydrogen atoms to the inner shell of the oxygen atom, representing chemical bonds. A '+' sign is to the left of the top hydrogen atom, and another '+' sign is to the left of the bottom hydrogen atom. A '-' sign is to the right of the oxygen atom.</p> </div> <p>H₂O Molecule</p>
<p>2. Right Atoms</p>	<p>Exact balance in the amounts of the strong and weak nuclear forces, gravity and the nuclear ground state energies is needed for the atoms to form key elements like the Hydrogen.</p> <div style="text-align: center;">  <p>The diagram shows a central nucleus labeled 'proton' with a '+' sign inside. A single electron shell surrounds the nucleus, with a small circle labeled 'electron' on the shell. The entire structure is labeled 'Hydrogen Atom' above it.</p> </div>

3. Right Nucleons (protons and neutrons)	The neutron is 0.138% more massive (heavy) than a proton, such that seven times more protons was produced and just enough neutrons were created after the big bang to make the nuclei of all life-essential heavy elements, examples are iron (Fe) and zinc (Zn). Iron for instance forms an essential part of hemoglobin, a protein in our blood which transports oxygen from the lungs to other tissues.
4. Right Electrons	The number of electrons should be equal to the number of protons to an accuracy of one part in 10^{37} or better so that electromagnetic forces in the universe can overcome gravitational forces. This makes it possible for the galaxies, star and planets to be formed. All of the masses, charges and forces of interaction in the universe had to be in just the precisely needed amounts so that early atoms could form.

Table 1. Building Blocks for Life

Ross likened the possibility of no one designing and creating the universe to Hoyle's argument that living organisms could not have arisen by chance alone. Hoyle writes "A junkyard contains all the bits and pieces of a Boeing 747, dismembered and in disarray. A whirlwind happens to blow through the yard. What is the chance that after its passage a fully assembled 747, ready to fly, will be found standing there? So small as to be negligible, even if a tornado were to blow through enough junkyards to fill the whole Universe." (The Intelligent Universe, 1983, p. 19)

Ross' reason for presenting the building blocks for life is simply to assert that there must be a Supreme Being that designed the universe exactly or "just right" for life to happen and be sustained. God amazingly created everything so precisely for the universe to provide these blocks and the right processes for the existence of life.

Ross further enumerates different parameters for the evidence of the fine-tuning of the universe in his The Creator and the Cosmos book. Below are a few of them:

1. *gravitational force constant*

if larger: star would be too hot and burn up quickly and too unevenly
 if smaller: star would remain so cool that nuclear fusion would never ignite, hence no-heavy element production.

2. *expansion rate of the universe*

if larger: no galaxy formation
 if lower: universe would collapse prior to star

formation

3. *velocity of light*

if faster: stars would be too luminous
 if slower: stars would not be luminous enough

4. *average distance between galaxies*

if larger: insufficient gas would be infused into our galaxy to sustain star formation over an adequate time span

if smaller: the sun's orbit would be too radically disturbed

5. *planet's magnetic field*

if stronger: electromagnetic storms would be too severe, too few cosmic-ray protons would reach the planet's troposphere, inhibiting adequate cloud formation

if weaker: ozone shield would be inadequately protected from hard stellar and solar radiation, time between magnetic reversals would be too brief for the long term maintenance of advanced life civilization.

6. *gravitational interaction with the moon*

if much greater: Axial tilt variations would make life impossible

if greater: tidal effects on the oceans, atmosphere, and rotational period would be too severe

if much less: axial tilt instability would make advance life impossible

if less: orbital obliquity changes would cause climatic instabilities; movement of nutrients and life from the oceans to continents and vice versa would be

insufficient; magnetic field would be too weak

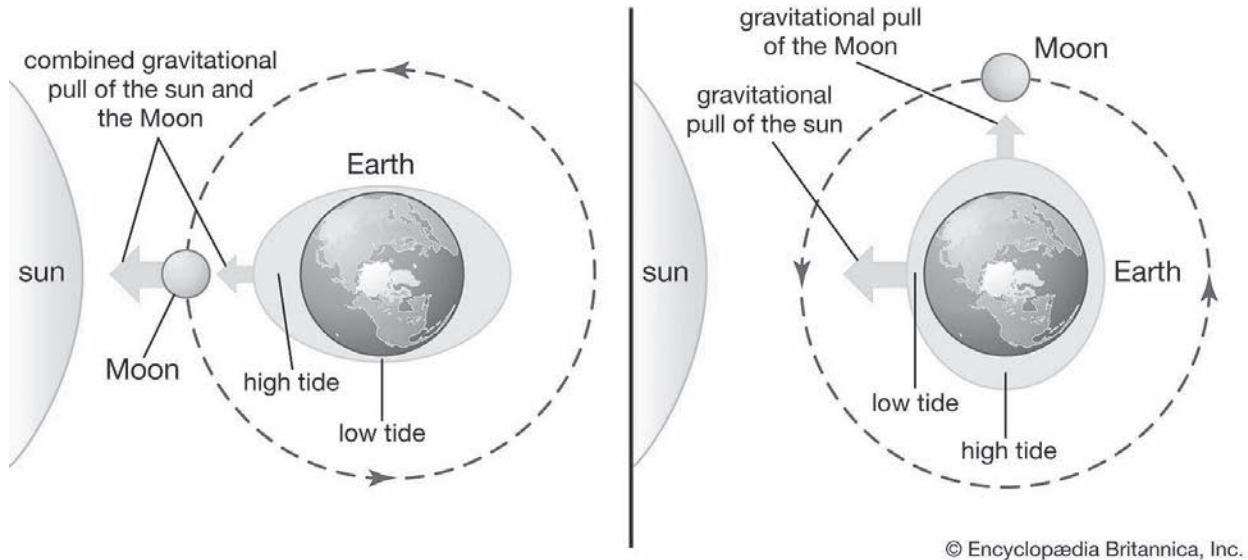
To expound on number six, *gravitational interaction with the moon*,

the Moon causes the Earth to have ocean tides. Tides are periodic rises and falls in the level of the sea. Tides occur because the Moon exerts the pull of gravity on the ocean water, causing it to rise and fall on a regularly. The gravitational pull of the Moon causes the surface of the ocean to go up and outward in the direction of the Moon. When the mound of water has reached its highest point it is called

high tide. On the side of Earth opposite the Moon, the centrifugal force caused by Earth's rotation produces another high tide. Between these two high tides are two flat areas on the surface of the ocean, which are low tides.

If tides do not occur because of a change in gravitational forces (less), the nutrients would not be distributed across the oceans such that life forms would not survive in some area.

If gravitational forces were more than what it is, the effects of the tides on the oceans would be catastrophic.



© Encyclopædia Britannica, Inc.

Illustration from Encyclopædia Britannica

B. Michael Guillen

Michael Guillen earned his BS from UCLA and his MS and PhD from Cornell University in physics, mathematics and astronomy. For eight years he was an award-winning physics instructor at Harvard University. For fourteen years he was the Emmy-award-winning science correspondent and science editor for ABC News, appearing regularly on “Good Morning America,” “20/20,” “Nightline,” and “World News Tonight.” Dr. Guillen is the host of the History Channel series, “Where Did It Come From?”. He also hosts the weekly podcast “Science + God with Dr. G.”. He is also the president of Spectacular Science Productions.

Guillen, in his book *Believing is Seeing*,

narrates that although reared in a Pentecostal family, he became an atheist after graduating from UCLA for to him at that time, science and atheism go hand in hand.

Then he met his wife to be, Laurel, in Cornell and started to read and study the Bible together. He then started asking questions like “Is it possible to reconcile what today’s science says is true with what a book (the Bible) thousands of years old says about reality? How alike are the biblical and scientific worldviews, really?” (*Believing is Seeing*, 2021, p30)

He used a systematic, evidence based strategy to explore and discover the answers. The outcome was the matrix below. (p39)

	Scientific	Atheistic	Christian
1. Does absolute truth exist?	YES	NO	YES
2. Are there truths that cannot be proven?	YES	NO	YES
3. Is the universe designed for life?	YES	NO	YES

Guillen further wrote “This outcome shocked me because I’d always take it for granted that atheism was wholly in line with science, my life’s pursuit. And that Christianity was wholly in conflict with my beloved science.” (p40)

The last question, “Is the universe designed for life” was pondered on by Guillen through Sir Martin Rees book “Just Six Numbers”. This was enumerated earlier in this paper. Guillen calls them six vital signs of the universe.

Guillen wrote “The six vital signs encompass exactly-not approximately, exactly-the values necessary for life to exist in the universe. And not just human life, mind you, but any and all organic life forms...

If any of the vital signs were off be even a smidgen, neither you or I nor any of Earth’s plants and animals-nor any life forms possibly existing on other worlds-would or could exist. The universe would be thoroughly desolate, like some cosmic-sized ghost town.

Is this really coincidence? Did our universe get lucky? Well you could easily shrug off a few perfectly calibrated vital signs. But six or more?

To comprehend the enormous improbability of our situation, take a look at one of Sir Martin’s vital signs: lambda (Λ), the

cosmological constant. Lambda tell us something about how fast the universe is accelerating outward, like a gigantic inflating balloon of space-time -an expansion we believe might be driven by repulsive, omnipresent, invisible fog called dark energy. Lambda also tells us something about the age of the universe and about whether life in the universe is possible or not.

Your chances of winning the Powerball or Mega Millions lottery are about one in 175 million.

The chance of lambda having precisely the value necessary for life-which it does- is one in a trillion trillion trillion trillion trillion trillion trillion trillion trillion trillion. In scientific notation $1:10^{120}$.” (p33-34)

What Guillen is saying of about the fine-tuning of values of the vital signs for all life forms to survive is simply that everything about them were exactly or precisely correct and that the chance of them being so correct on their own is almost impossible to attain. Only with an infinitely superior Creator God could design it to be.

He continued to ask the following questions and discovered answers that found accord between science and Christianity.

	Scientific World View	Christian Worldview
Are humans unique?	YES	YES
Is light special?	YES	YES

In the same book, he describes why humans are unique. It was mainly because of their multiple intelligences, chief of which is the spiritual intelligence as he calls it. He wrote

“As I contemplated both Gardner’s and Goleman’s claims, I though it odd that no one had yet talked about spiritual intelligence or SQ as I came to call it. After all, one of the

unique traits of our species is our spirituality: our religious art, literature, and music, our belief in supernatural deities and an afterlife; our habit of burying our dead with great ceremony; and our powerful religious passions, which routinely erupt in ways heavenly and hellish.

To put it plainly: Spiritual Intelligence is what makes us humans unique; no other animal on the planet has it. That is, for you and me, SQ is a nonzero positive integer. For all other creatures, it is zero. Tangible evidence of our SQ is everywhere. In paintings, such as The Last Supper, buildings such as the Notre-Dame cathedral: literature such as *Paradise Lost*, oratorios such as Handel's *Messiah* and countless other divinely inspired creations. No other living being on Earth does such things." (p45)

To appreciate why Guillen chose these to questions, one must take time to read his book fully.

It is suffice to say, for the purposes of this paper, that Guillen's exploration and discovery led him to fully grasp the fundamental compatibility of Scientific and Christian worldviews. He later on embraced Christianity.

C. Michael O'Connell

Michael O'Connell graduated from Purdue University and was a Key Staff Engineer at the Jet Propulsion Laboratory of the NASA space science and technology center operated by the California Institute of Technology. As a "rocket scientist", he too struggled between atheist claims based in science and his Christian faith. In writing his book "Finding God in Science" he endeavors to share his resolved convictions as a Christian who believes in the consistency of biblical scriptures and science.

In Chapter 3 of his book aptly titled, *The Goldilocks Planet*, he writes, *The Bible and Life Science*. "Earth alone has a complete water cycle of evaporation, humidity, rain, rivers and oceans. tellingly, the water cycle that produces rain was described in the Bible long before its modern discovery. David wrote in Psalms, "*He*

(the LORD) cause the vapors to ascend from the ends of the earth; He makes lighting for the rain." Psalm 135:6-7 KJV. Job 36:27 plainly says "*He draws up drops water, which distill as the rain from the mist*", describing invisible but key features of the Earth cycles.

Actually, the existence of a compound like water is a greater miracle than a planet where everything is just right for life. Water has all the properties of mass, acid neutrality, liquidity, viscosity, and dissolving power necessary to make the biosphere work. It powers the fluids in individual cells, blood, nervous systems and digestive systems. In fact, two thirds of the human body consist of water." (p55)

Here, O'Connell, demonstrates two things, first, the congruency of biblical scriptures and scientific facts, particularly the water cycle; and second, how finely-tuned the earth is as to have the life-giving, life sustaining compound, water in abundance and with all its exactly right properties.

In another paragraph in this chapter, *Design is Real*, he quotes Anthony Flew, a former atheist and philosopher, who now holds to the reality of design: "Although I was once sharply critical of the argument of design, I have since come to see that, when correctly formulated, this argument constitutes a persuasive case for the existence of God. Developments in two areas, in particular, have led me to this conclusion. The first is the question of the origin of the laws of nature and the related insights of eminent modern scientist. The second is the question of the origin of life and reproduction".

O'Connell further expounds on the "just-right" design of the very special Earth. "Most of the rocky planetary bodies in the solar system displays a number of meteor impacts, with the craters lying on top of other craters, except on Earth where surface has been plowed, crushed, and overflowed by water, wind, tectonic plate movement and volcanism. In fact, most of earth's impact craters are so erode and buried they can only be seen from space and those are just the largest ones.

Collisions of the major land mass plates created our majestic mountains. Spewing volcanoes brought minerals and water up from deep within the planet making Earth habitable. As destructive as earthquakes and volcanoes can be, there is just enough geological activity to sustain the planetary magnetic field that protects us, and the atmosphere, from space radiation, yet there is not so much activity that ecologies and societies are completely disrupted.

Without the geological forces that drive the

occasional earthquake, volcano, tsunami, the Earth would cool, lose most of its atmosphere and its ability to support complex life. earth would soon become a dead planet much like Mars. These massive planetary forces seemed to have been miraculously balance by the loving hand of the Creator to create a generally benevolent Earth.” (p64)

The table below summarizes the above forces and conditions O’Connell wrote pertaining to how unique the Earth is.

Forces and Conditions	Other Planets	Earth
1. crater displays of major impacts	Present	Not Present
2. collisions of major land mass to create mountains	Not Present	Present
3. volcanoes spewing minerals and water from deep within	Not Present	Present
4. presence of minerals and water to make a planet habitable	Not Present	Present
5. just enough geological activity to sustain the planetary magnetic field	Not Present	Present
6. just enough magnetic field to protect living beings and the atmosphere from space radiation	Not Present	Present
7. geological forces to keep the planet from cooling and lose its atmosphere	Not Present	Present

Table 2 Forces and Conditions that make the Earth Unique

O’Connell ends this Chapter 3 of his book so expressively. “From the parched barren surface of Mercury to the hellish acidic atmosphere of Venus, the Earth stands out as a miracle world. The odds against the existence of another world nearby as wonderful as Earth are imposing. It took a galaxy of mind-boggling scale to produce a planet with just the right orbit, just the right size and the right atmosphere, along with the liquid water to support large complex life forms. I believe it is legitimate to see the conditions on Earth as a proof mark of God.

Atheist would say that in a universe so large the Earth is just a happy accident. But if you know in your innermost being that God exists, it does not take much faith to see His hand in the universe. I believe it is reasonable to take the consistency of the Bible with the cosmological and evolutionary science as an

extraordinary sign of God’s supernatural revelation. Nothing from science needs to be a stumbling block to faith in Christ.” (p65)

IV. A Short List of Christian-Scientists

This very incomplete list of past and present Christian scientists is presented to remove the popular notion or stereotype that all scientists are atheists. Disdain for religion by scientists is not unanimous. This would also help purge the assumption that science and Christian belief are mutually exclusive.

1. Isaac Newton 1643 to 1727

Passionate dissenting Protestant who spent more time on Bible study than math and physics. Profoundly changed our understanding of nature with his law of universal gravitation and his laws of motion; invented calculus; built the first ever reflecting telescope; showed

sunlight is made of all the colors of the rainbow

2. *Michael Faraday 1791 – 1867*

A devout member and elder of the Sandemanian Church. Discovered electromagnetic induction; discovered the first experimental link between light and magnetism; carried out the first room-temperature liquefaction of a gas.

3. *Robert Boyle 1627 – 1691*

Said that a deeper understanding of science was a higher glorification of God. Defined elements, compounds, and mixtures. Discovered the first gas law, Boyle's Law.

4. *James Clerk Maxwell 1831 – 1879*

An evangelical Protestant who learned the Bible by heart at age 14. Transformed our understanding of nature: his famous equations unified the forces of electricity and magnetism, indicating that light is an electromagnetic wave. His kinetic theory established that temperature is entirely dependent on the speeds of particles

5. *Ronald Fisher 1890 – 1962*

A devout Anglican: made religious broadcasts, and wrote religious articles. Unified evolution by natural selection with Mendel's rules of inheritance, so defining the new field of population genetics. Invented experimental design; devised the statistical concept of variance.

6. *Georges Lemaître 1894 – 1966*

Roman Catholic priest. Discovered that space and the universe are expanding; discovered Hubble's law; proposed the universe began with the explosion of a 'primeval atom' whose matter spread and evolved to form the galaxies and stars we observe today.

7. *John Dalton 1766 – 1844*

A faithful Quaker who lived modestly. Dalton's Atomic Theory is the basis of chemistry; discovered Gay-Lussac's Law relating temperature, volume, and pressure of gases; discovered the law of partial gas pressures.

8. *Charles Babbage 1791 – 1871*

A Protestant devotee who devoted a chapter of his autobiography to a discussion of his faith. The father of the computer, invented the Analytical Engine, a Turing Complete computer

in 1837 – the first general purpose computer.

9. *Arthur Eddington 1882 – 1944.*

A Quaker, who believed the hand that made us is Divine. He was the first scientist to propose stars obtain their energy from nuclear fusion. Experimentally verified Einstein's General Theory of Relativity

10. *Carl Friedrich Gauss 1777 – 1855*

A Lutheran Protestant who believed science revealed the immortal human soul and that there is complete unity between science and God. Gauss revolutionized number theory and invented the method of least squares and the fast Fourier transform. His profound contributions to the physical sciences include Gauss's Law & Gauss's Law for Magnetism.

11. *Charles Barkla 1877 – 1944*

A Methodist who believed science was part of his quest for God. Discovered that atoms have the same number of electrons as their atomic number and that X-rays emitted by excited atoms are 'fingerprints' for the atom.

12. *Humphry Davy 1778 – 1829*

Said that God's design was revealed by chemical investigations. Discovered the electrical nature of chemical bonding. Used electricity to split several substances into their basic building blocks for the first time, discovering chlorine and iodine; produced the first ever samples of the elements barium, boron, calcium, magnesium, potassium, sodium, and strontium. Invented the safety lamp

13. *Ernest Walton 1903 – 1995*

A devout Methodist, who said science was a way of knowing more about God. Winner of the Nobel Prize in Physics after he artificially split the atom and proved that

$$E = mc^2$$

14. *Samuel Morse 1791 – 1872*

A Calvinist with Unitarian sympathies who funded a lectureship considering the relation of the Bible to the Sciences. Took part in the invention of a single-wire telegraph and patented it. Developed the Morse code.

(List above is from the 34 Great Scientists Who Were Committed Christians, 2022)

15. *C. F. von Weizsäcker 1912–2007*

German nuclear physicist who is the co-discoverer of the Bethe-Weizsäcker formula. His *The Relevance of Science: Creation and Cosmogony* concerned Christian and moral impacts of science. He headed the Max Planck Society from 1970 to 1980. After that he retired to be a Christian pacifist.

16. *Charles H. Townes 1915–2015*

In 1964 he won the Nobel Prize in Physics and in 1966 he wrote *The Convergence of Science and Religion*.

17. *Walter Thirring 1927–2014*

Austrian physicist after whom the Thirring model in quantum field theory is named. He is the son of the physicist Hans Thirring, co-discoverer of the Lense-Thirring frame dragging effect in general relativity. He also wrote *Cosmic Impressions: Traces of God in the Laws of Nature*.

18. *Edward Nelson 1932–2014*

American mathematician known for his work on mathematical physics and mathematical logic. In mathematical logic, he was noted especially for his internal set theory, and views on ultrafinitism and the consistency of arithmetic. He also wrote on the relationship between religion and mathematics.

19. *John Polkinghorne 1930–2021*

British particle physicist and Anglican priest who wrote *Science and the Trinity* (2004) ISBN 0-300-10445-6. He was professor of mathematical physics at the University of Cambridge prior to becoming a priest. Winner of the 2002 Templeton Prize.[229]

20. *Lindon Eaves 1944–2022*

British behavioral geneticist who published on topics as diverse as the heritability of religion and psychopathology. In 1996, he and Kenneth Kendler founded the Virginia Institute for Psychiatric and Behavioral Genetics at Virginia Commonwealth University, where he was professor emeritus and engaged in research and training.

21. *Russell Stannard 1931–2022*

British particle physicist who has written several books on the relationship between religion and science, such as *Science and the*

Renewal of Belief, Grounds for Reasonable Belief and Doing It With God.

22. *Denis Alexander born 1945*

Emeritus Director of the Faraday Institute at the University of Cambridge and author of *Rebuilding the Matrix – Science and Faith in the 21st Century*. He also supervised a research group in cancer and immunology at the Babraham Institute.

23. *Francis Collins (born 1950)*

Director of the National Institutes of Health and former director of the US National Human Genome Research Institute. He has also written on religious matters in articles and the book *The Language of God: A Scientist Presents Evidence for Belief*.

24. *Darrel R. Falk (born 1946)*

American biologist and the former president of the BioLogos Foundation.

25. *Charles Foster (born 1962)*

Science writer on natural history, evolutionary biology, and theology. A Fellow of Green Templeton College, Oxford, the Royal Geographical Society, and the Linnean Society of London, Foster has advocated theistic evolution in his book, *The Selfless Gene* (2009).

26. *Kenneth R. Miller (born 1948)*

Molecular biologist at Brown University who wrote *Finding Darwin's God*.

27. *Simon C. Morris (born 1951)*

British paleontologist and evolutionary biologist who made his reputation through study of the Burgess Shale fossils. He has held the chair of Evolutionary Palaeobiology in the Department of Earth Sciences, University of Cambridge since 1995. He was the co-winner of a Charles Doolittle Walcott Medal and also won a Lyell Medal.

28. *Ghilleen Prance (born 1937)*

Botanist involved in the Eden Project. He is a former president of Christians in Science.

29. *Joan Roughgarden (born 1946)*

Evolutionary biologist who has taught at Stanford University since 1972. She wrote the book *Evolution and Christian Faith: Reflections of an Evolutionary Biologist*.

30. *Mary Higby Schweitzer*

Paleontologist at North Carolina State University who believes in the synergy of the Christian faith and the truth of empirical science.

31. *Troy Van Voorhis*

American chemist who is currently the Haslam and Dewey Professor of Chemistry and chair of the Department of Chemistry at the Massachusetts Institute of Technology.

32. *John White*

Australian chemist who is currently Professor of Physical and Theoretical Chemistry, Research School of Chemistry, at the Australian National University. He is a past president, Royal Australian Chemical Institute and president of Australian Institute of Nuclear Science and Engineering.

33. *Arnold O. Benz (born 1945)*

Swiss astrophysicist, currently professor emeritus at ETH Zurich. He is known for his research in plasma astrophysics, in particular heliophysics, and received honorary doctoral degrees from the University of Zurich and The University of the South for his contributions to the dialog with theology.

34. *Joan Centrella*

American astrophysicist known for her research on general relativity, gravity waves, gravitational lenses, and binary black holes. She is the former deputy director of the Astrophysics Science Division at NASA's Goddard Space Flight Center, and is Executive in Residence for Science and Technology Policy at West Virginia University.

35. *George Francis Rayner Ellis (born 1939)*

Professor of Complex Systems in the department of mathematics and applied mathematics at the University of Cape Town in South Africa. He co-authored *The Large Scale Structure of Space-Time* with University of Cambridge physicist Stephen Hawking, published in 1973, and is considered one of the world's leading theorists in cosmology.

35. *Pamela L. Gay (born 1973)*

American astronomer, educator and writer, best known for her work in astronomical podcasting. Doctor Gay received her PhD from

the University of Texas, Austin, in 2002. Her position as both a skeptic and Christian has been noted upon.

36. *Karl W. Giberson (born 1957)*

Canadian physicist and evangelical, formerly a physics professor at Eastern Nazarene College in Massachusetts, Giberson is a prolific author specializing in the creation-evolution debate and who formerly served as vice president of the BioLogos Foundation. He has published several books on the relationship between science and religion, such as *The Language of Science and Faith: Straight Answers to Genuine Questions* and *Saving Darwin: How to be a Christian and Believe in Evolution*.

37. *Owen Gingerich (born 1930)*

Mennonite astronomer who went to Goshen College and Harvard. He is Professor Emeritus of Astronomy and of the History of Science at Harvard University and Senior Astronomer Emeritus at the Smithsonian Astrophysical Observatory. Mr. Gingerich has written about people of faith in science history.

38. *J. Richard Gott (born 1947)*

Professor of astrophysical sciences at Princeton University. He is known for developing and advocating two cosmological theories with the flavor of science fiction: Time travel and the Doomsday argument. When asked of his religious views in relation to his science, Gott responded that "I'm a Presbyterian. I believe in God; I always thought that was the humble position to take. I like what Einstein said: "God is subtle but not malicious." I think if you want to know how the universe started, that's a legitimate question for physics. But if you want to know why it's here, then you may have to know—to borrow Stephen Hawking's phrase—the mind of God."

39. *Robert Griffiths (born 1937)*

Noted American physicist at Carnegie Mellon University. He has written on matters of science and religion.

40. *Don Page (born 1948)*

Canadian theoretical physicist and practicing Evangelical Christian, Page is known for

having published several journal articles with Stephen Hawking.

41. *Suchitra Sebastian*

Indian condensed matter physicist and Professor of Physics at the University of Cambridge. She is known for her work in quantum materials, particularly for the discovery of unconventional insulating materials which display simultaneous conduction-like behaviour. She was named as one of thirty ‘Exceptional Young Scientists’ by the World Economic Forum in 2013 and one of the top ten ‘Next big names in Physics’ by the Financial Times.

42. *Michael G. Strauss (born 1958)*

American experimental particle physicist. He is a David Ross Boyd Professor at the University of Oklahoma in Norman and a member of the ATLAS experiment at CERN that discovered the Higgs Boson in 2012. He is author of the book *The Creator Revealed: A Physicist Examines the Big Bang and the Bible* and one of the general editors of Zondervan’s *Dictionary of Christianity and Science*.

43. *David C. Watts (born 1945)*

British biophysicist who is a Professor of Biomaterials Science at the University of Manchester: co-discoverer of the KWW stretched-exponential function for relaxation phenomena in condensed media and expert on photopolymerised composite biomaterials. He advocates constructive engagement between Christianity and science and is a member of the Faraday Institute.

44. *John Suppe (born 1942)*

Professor of geology at National Taiwan University, Geosciences Emeritus at Princeton University. He has written articles like “Thoughts on the Epistemology of Christianity in Light of Science.”

45. *Robert (Bob) White*

British geophysicist and Professor of Geophysics in the Earth Sciences department at the University of Cambridge. He is director of the Faraday Institute for Science and Religion.

46. *Steve Furber (born 1953)*

British computer scientist, mathematician and hardware engineer, currently the ICL Professor of Computer Engineering in the Department of Computer Science at the University of Manchester. He leads research into asynchronous systems, low-power electronics and neural engineering, where the Spiking Neural Network Architecture (SpiNNaker) project is delivering a computer incorporating a million ARM processors optimized for computational neuroscience.

47. *Pat Gelsinger (born 1962)*

American computer engineer and architect who was the first chief technology officer of Intel Corporation and is currently the CEO of VMware. He was the architect and design manager on the Intel 80486 which provided the processing power needed for the personal computer revolution through the 1980s into the 1990s.

48. *Donald Knuth (born 1938)*

American computer scientist, mathematician, and professor emeritus at Stanford University. He is the author of the multi-volume work *The Art of Computer Programming* and *3:16 Bible Texts Illuminated*.

49. *Justin L. Barrett (born 1971)*

American experimental psychologist and director of the Thrive Center for Human Development and Professor of Psychology at Fuller Graduate School of Psychology after being a researcher at the University of Oxford, Barrett is a cognitive scientist specializing in the cognitive science of religion. He has published “Cognitive Science, Religion, and Theology”. Barrett has been described by the New York Times as ‘an observant Christian who believes in “an all-knowing, all-powerful, perfectly good God who brought the universe into being,” as he wrote in an e-mail message. “I believe that the purpose for people is to love God and love each other.”’

50. *Denis Lamoureux (born 1954)*

Evolutionary creationist. He holds a professorial chair of science and religion at St. Joseph’s College at the University of Alberta — the first of its kind in Canada. Co-wrote (with

Phillip E. Johnson) *Darwinism Defeated? The Johnson-Lamoureux Debate on Biological Origins* (1999). *Wrote Evolutionary Creation: A Christian Approach to Evolution* (2008).

51. *Alister McGrath (born 1953)*

Prolific Anglican theologian who has written on the relationship between science and theology in *A Scientific Theology*. McGrath holds two doctorates from the University of Oxford, a DPhil in Molecular Biophysics and a Doctor of Divinity in Theology. He has responded to the new atheists in several books, i.e. *The Dawkins Delusion*. He is the Andreas Idreos Professor of Science and Religion at Oxford.

52. *George Varghese (born 1960)*

Currently the chancellor's professor in the department of computer science at UCLA and former principal researcher at Microsoft Research.

53. *Larry Wall (born 1954)*

Creator of Perl, a programming language.

54. *Ian H. White (born 1959)*

British engineer who is the van Eck Professor of Engineering at the University of Cambridge, as well as Vice-Chancellor for the University of Bath. Highlights of his research have included: the development of the first all-optical laser diode flip-flop, the first negative chirp electroabsorption modulator and the invention of a technique for transmitting radio frequency signals over long distances of multimode optical fibre.

55. *Bienvenido Nebres (born 1940)*

Filipino mathematician, president of Ateneo de Manila University, and an honoree of the National Scientist of the Philippines award (List above is from the *Christians in science and technology*, 2022)

V. Conclusion

Everything the world and its inhabitants needed in order to exist came into being, as obviously evidenced by life itself today. The universe was precisely tailor-made for the emergence of life on Earth. Modern science shows that this universe cannot function

seamlessly with deviations from its present parameters. There seems to be a unique "recipe" for life to exist. The laws here and now are necessary prerequisite for life on earth, no other star or planet have them, they are unique to Earth.

Even the tiniest particles of matter are so complicated, yet entirely perfect. It appears that even the simplest elements of nature have been designed and created by a supernaturally perceptive Being. The incredible fine-tuning of the universe presents the most powerful argument for the existence of an inherently creative and powerful entity, God. Scientific evidence of the fine-tuning parameters points to the divine power and intelligence of God to create and orchestrate such.

The universe was not created as perfectly as it is by chance. The British mathematician Roger Penrose has calculated, based on only one of the hundreds of parameters of the physical universe, that the probability or odds of the emergence of a life-giving cosmos as orderly as our galaxy was 1 divided by 10, raised to the power 10, and again raised to the power of 123. (*The Emperor's New Mind*, 1986). This number is practically zero. Clearly, a blueprint for a just-right universe can only be so meticulously crafted by God, omnipotent, omniscient, omnipresent and omnibenevolent.

These insights implied by deep physical realities have the power to defend God and the Christian faith and the harmony of science and faith. Ross puts the whole concept of a Creator God in a poignant, simple way "Even as a child I always felt a sense of awe concerning nature. Its beauty, harmony, and staggering complexity left me wondering who or what could be responsible for it all. By age fifteen, I came to understand that some form of the big bang theory provided the only reasonable explanation for the universe. If the universe arose out of a big bang, it must have a beginning. If it had a beginning, it must have a Beginner." (*The Creator and the Cosmos*)

The Bible informs us, "So then faith cometh by hearing, and hearing by the word of God"

(Romans 10:17, KJV). Evidence-based information is not, by all means, the aspect that renders a person to believe in God. It can, perhaps, ignite or solidify his faith. Evidence alone leaves the matter in the human intellectual sphere. This should not be so. It is the Word of God, as given in the Holy Bible, that should convict man and reveal to him his true condition without God and apart from Christ. “For the word of God is alive and active. Sharper than any double-edged sword, it penetrates even to dividing soul and spirit, joints and marrow; it judges the thoughts and attitudes of the heart” (Hebrews 4:12, NIV).

To the Lord, Jesus Christ, be the glory and thanksgiving!

References

- The Holy Bible: New International Version. Grand Rapids: Zondervan, 1984.
- The Holy Bible: King James Version. Bible Gateway <https://www.biblegateway.com/versions/King-James-Version-KJV-Bible/>
- Cosmos, Britannica. Retrieved September 12, 2022 from <https://www.britannica.com/science/Cosmos-astronomy>
- Lord Kelvin, quoted in the Twelfth Report of the Committee of the Christian Evidence Society, London: G. Norman and Son, 1883
- Jones, Henry Bence. The Life and Letters of Faraday, Vol. 2, London: Longmans, Green and Co., 1870, ISBN-10 053048515X
- Polkinghorne, John; Beale, Nicholas Questions of Truth: Fifty-One Responses to Questions about God, Science, and Belief. Westminster John Knox Press, 2009. ISBN 978-0-664-23351-8
- Collins E, Francis S.: The Language of God: A Scientist Presents Evidence for Belief, Free Press, 2007, ISBN-10 1416542744
- Albert Einstein, Ideas and Opinions (New York: Dell, 1973) 54-55
- The Fine-Tuning of the Universe, 2016, retrieved September 5, 2022 from <https://youtu.be/EE76nwimuT0>
- The Fine-Tuning of the Universe, Pursue. Retrieved September 5, 2022 from <https://www.pursuegod.org/the-fine-tuning-of-the-universe-as-evidence-of-god/>
- Hoyle, Fred Hoyle and Wickramasingh, N. Chandra, Evolution from Space, J.M. Dent & Sons, 1981, ISBN 10: 0460045350 ISBN 13: 9780460045353
- Davies, Paul Charles, The Cosmic Blueprint: New Discoveries In Nature’s Creative Ability To Order Universe, Templeton Press (first published 1988), ISBN1932031669
- Rees, Martin J., Just Six Numbers: The Deep Forces that Shape the Universe, Weidenfeld & Nicolson, London, 1999. ISBN-10 0297842978
- Roberts, Peter, Review of Just Six Numbers, Vision. Retrieved August 22, 2022 from <https://www.vision.org/review-just-six-numbers-1139>
- Hawking, Stephen, A Brief History of Time, Bantam Books, 1988, ISBN 0-553-05340
- Ross, Hugh, The Creator and the Cosmos: How the Latest Scientific Discoveries Reveal God, Fourth Edition, RTB Press, 2018, ISBN 978-1-886653-14-6
- Guillen, Michael, Believing Is Seeing, Tyndale, 2021, ISBN 978-1-4964-5558-1
- O’Connell, Michael, Finding God in Science, Eigen Publishing, 2016, ISBN 978-0-9973690-2-1
- Hoyle, Fred, The Intelligent Universe, Holt, Rinehart and Winton, 1988, ISBN-10 0030700833
- 34 Great Scientists Who Were Committed Christians, Famous Scientists the art of genius. Retrieved September 23, 2022 from <https://www.famousscientists.org/great-scientists-christians/>
- List of Christians in science and technology, Wikipedia, last edited on 29 September 2022. Retrieved September 29, 2022 from https://en.wikipedia.org/wiki/List_of_Christians_in_science_and_technology
- Penrose, Roger, The Emperor’s New Mind, Oxford University Press, 1989, ISBN-13: 978-0192861986

