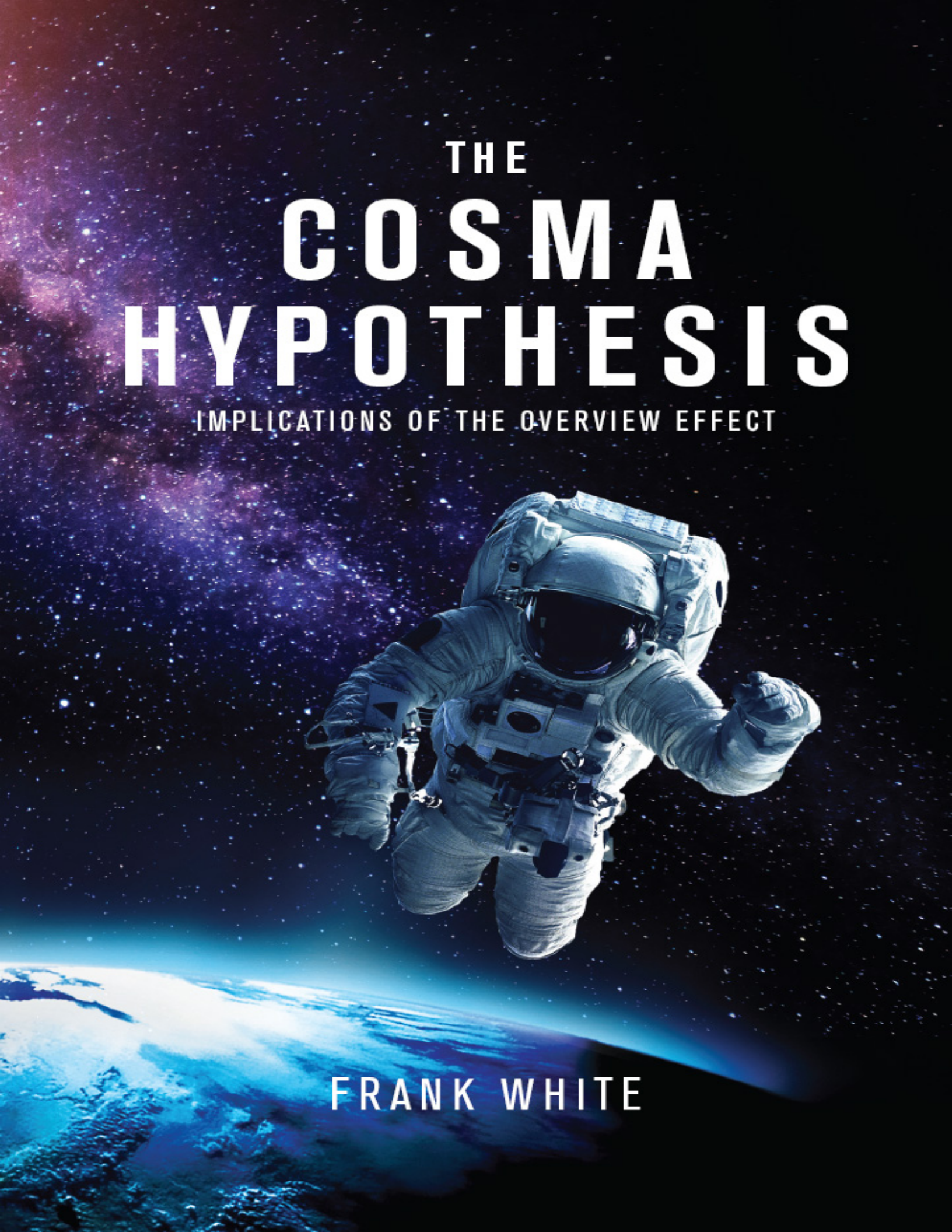
THE COSMA HYPOTHESIS

IMPLICATIONS OF THE OVERVIEW EFFECT



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THE UNIVERSAL INSIGHT

[Going to the moon] gets you closer to a more universal experience because of the distance and wider view. You identify more with the universe as it is instead of the Earth as it is.

—APOLLO 14 ASTRONAUT EDGAR MITCHELL

OBSERVERS OFTEN CITE Edgar Mitchell's experience on his return from the moon in 1971 as the epitome of the Overview Effect, the very best example of the phenomenon. However, even as early as 1986, I considered it to be something else that deserved a different name. Here is a description of what happened to him that appeared in *Omni* magazine:

> On the way back from the moon, while contemplating the earth, Mitchell had a "peak experience or a religious experience, depending on what word you want to use." It was an "explosion of awareness, an aha! a wow!" It was, apparently, what a religious person would call a revelation. He came to realize that the universe is made up of spirit and matter but that they are not separate. The bridge is consciousness. God is something like a universal consciousness manifest in each individual, and the route to divine reality and to a more satisfying human, material reality is through the human consciousness. (1)

Over time, the word has spread on the Internet that all the astronauts had a "euphoric" experience or even a "spiritual" experience. If this were true, it would be wonderful, but I doubt that most astronauts would agree that such

a dramatic epiphany took place (I give great credit to my friend and colleague David Beaver for insisting on this perspective). However, most of them might agree that "something happens," which then must be interpreted in the light of each astronaut's past and present experiences.

The Overview Effect is an "identity-shifting" experience that changes our self-image by transforming our experience of "the other." One of the key insights that I gleaned from talking with astronauts was this: we cannot fully define "self" without also defining "other." Most of the astronauts went through a shift in identity from seeing themselves in relationship to parts of our planet (such as their hometown, home state, or country) to seeing themselves in relationship to the planet as a whole. As I interviewed even more astronauts for the third edition of the book, I increasingly found them talking about their relationship with the *universe* as well. With more interviews, I began to look back at some of my older astronaut conversations and realized I might have missed something in terms of identity, because I had focused so heavily on the way in which the astronauts had shifted from relating to parts of the Earth to relating to the whole.

When we say that they look at the Earth "in space," we are really saying they look at the Earth "in the universe." Their relationship with the planet changes, but so does their relationship with the cosmos!

For example, Gerry Carr, whom I interviewed for the first edition of the book, described an EVA experience during his Skylab mission when he was standing on a telescope mounting of that early space station:

> I reared back and looked at Earth with no local frame of reference at all. It was a fine experience. I also looked at the comet Kohoutek and got a feeling for the infiniteness of the universe. (2)

As I have reviewed the early interviews, it seems that this connection with the universe is especially strong for those who were on EVA's. It may be that, in the right circumstances, such as being on an EVA, humans most readily have the capacity to identify with the universe as well as the Earth.

As noted earlier, in 1988, I wrote some 250 pages about the Cosma Hypothesis (some of which I have already quoted here), but was never quite sure what to do with it. At the time, I saw it as a book to be called *Citizens of the Universe.* Now, I know that much of that material will be used in this

book. Among the interesting developments in that unpublished manuscript, I came up with the principles for understanding the nature of the universe, which led off *Citizens* and now are central to this book.

Recently, I began to bring out the "Cosma Hypothesis" in *The Journal of Space Philosophy* and on the 2211.world website. In an essay titled "Deep Space: The Philosophy of the Overview Effect," I wrote:

> Building on the work that I have done concerning the Overview Effect, and on (James) Lovelock's suggestion that the Earth is a living system, I have posited the "Cosma Hypothesis." By this, I mean that the universe is also a living system with a degree of self-awareness. By definition, this must be so, since we are alive and conscious, and part of the universe. The question is whether, as we evolve, might our purpose be to help the universe become increasingly self-aware? (3)

The Hypothesis is somewhat tautological in the following sense:

- Human beings exist on planet Earth;
- Human beings are part of the universe;
- By definition, the universe (the whole) is alive, intelligent, and self-aware, because a part (humanity) of it is.

We are using some extremely important terms here, and they are easily misconstrued. In the course of this book, I may introduce several new definitions, but for now, I prefer to work with the most common definitions of a word like "alive."

Consider what the Merriam-Webster dictionary says about "life," "intelligence," and "self-awareness:"

> *Life:* the ability to grow, change, etc., that separates plants and animals from things like water or rocks.
> *Intelligence:* the ability to learn or understand things or to deal with new or difficult situations.
> *Self–awareness:* knowledge and awareness of your own personality or character. (4)

Based on these definitions, when we say an entity is alive, intelligent, and self-aware, we mean that it has the inherent ability to grow and change; to learn, understand, and cope with new situations; and to know something about its own nature. In other words, it has a degree of self-reflection.

This would apply to many different entities on the Earth, of course, most notably human beings.

A critic might say, "You cannot assert that the universe, which is enormous, is alive, intelligent, and self-aware because a group of organisms called 'humanity,' living on a small planet at the edge of one galaxy, is alive, intelligent, and self-aware."

This is a reasonable point, because my entire case is built on logic, and if it does not seem logical, it is not going to be strong enough to carry the day.

However, I am by no means the only person to have this point of view. Max Tegmark, MIT physicist, expert on artificial intelligence, and co-founder of the Future of Life Institute, has this to say in his excellent book, *Life 3.0: Being Human in the Age of Artificial Intelligence:*

> Thirteen point eight billion years after its birth, our Universe has awoken and become aware of itself. From a small blue planet, tiny conscious parts of our Universe have begun gazing out into the cosmos with telescopes, repeatedly discovering that everything they thought existed is merely a small part of something grander… (5)

Tegmark uses the term "conscious" where I would prefer "self-awareness." He also focuses on astronomers where I would focus on astronauts. However, our sentiments are similar.

Another difference lies in the origins of the Cosma concept. The Hypothesis emerged from my quest to develop a philosophy of space exploration, which led to the Overview Effect. This in turn led to the idea of *overview systems,* which pointed to Cosma as the ultimate kind of overview. (6)

The reason for this effort was to determine whether we might say with any degree of certainty that human space exploration serves a purpose beyond its benefits to humanity, i.e., does it benefit the universe?

The answer appears to be "yes," if we accept one other tenet of the Hypothesis, which is that evolution is a universal process. Once again, we

note that human beings, indeed all life on Earth, are evolving.

Turning to the dictionary once again, here are two definitions of evolution, and both are relevant:

1. The process by which different kinds of living organisms are thought to have developed and diversified from earlier forms during the history of the earth.
2. The gradual development of something, esp. from a simple to a more complex form. (7)

Note that neither of these definitions has anything to do, at least not directly, with *Darwinian* evolution. Darwin's theory includes concepts like natural selection and survival of the fittest. Evolution as a more general idea existed long before Darwin and is consistent with the first definition above. Our interest here is primarily in the second definition, which focuses on the development of simpler into more complex forms.

The point is that human evolution may benefit the universe by spreading life, intelligence, and self-awareness to parts of the universe where they do not now exist—or by linking up with other living and/or intelligent beings in other parts of the galaxy and universe to create greater self-awareness for Cosma.

Regarding that last point: at the moment, science is still engaged in a debate over whether human beings are alone in the universe. They are searching for life and intelligence and looking for Earth-like planets.

Is it possible, people ask, that with billions of stars in our galaxy and billions of galaxies in the universe, that only this one planet called Earth, circling a star at the outer reaches of the Milky Way galaxy, could produce thinking beings like ourselves? The known universe is enormous, and this gives great hope to those searching for beings like *Homo sapiens.*

The odds seem low that we actually are alone, but science demands evidence, and that remains tantalizingly out of reach. Humans have sent robot probes to the planets and moons in our solar system, looking for signs of life, both past and present. The search is focused on water, which we believe to be essential for life as we know it.

We have also developed sophisticated methods for detecting planets outside our solar system ("exoplanets") and determining if they are habitable. SETI (the Search for Extraterrestrial Intelligence) sweeps the sky

with radio telescopes, looking for any signals that might have been beamed toward Earth by an advanced technical civilization like ourselves. In spite of all the efforts that have been made over the past 50-60 years, we still have not proved that there are others like us in this vast universe.

The options are simple: either there is intelligent life like ourselves that make up Cosma, or there is not. (There may be something in between, but we could not communicate with it.) If there is, then we will eventually be in contact with them. If there is not, we will begin to leave the Earth and spread life and intelligence throughout our solar system, the galaxy, and beyond. Either way, seen from the perspective of the universe, Cosma will become more alive, intelligent, and self-aware.

This could be the larger purpose, then, of human space exploration, i.e., to support the evolution of the universe. This perspective takes the focus away from the typical effort to find reasons for space exploration that only benefit humans.

Let me emphasize again what I mean by *purpose* in this context.

As before, it may be worthwhile to consult the dictionary. In this case, I like the Bing Dictionary, which defines purpose as the:

> *Reason for existence:* the reason for which something exists or for which it has been done or made. (8)

Seen in this light, "purpose" does not refer to anything theological or teleological. It has nothing, necessarily, to do with religion.

A less loaded term that has the same meaning as purpose might be "ecological function." Consider the Earth: every organism has a purpose, or function, within the overall ecology of the planet. A well-known example is that plants make oxygen, which animals need, and animals make CO^2, which plants need. What may be a pest to one animal is a blessing to others. For example, mosquitoes are a nuisance and even a health problem for humans, but they provide food for bats and birds. While some bacteria may be harmful to humans, many that reside in the gut are absolutely necessary for our survival.

It is not easy for humans to imagine that the universe is our true environment, vast as it is. Still, that is really the case in the strictest sense, and so asking about our function within the universe is not too demanding a question. It is, at least, a question worth asking.

Today, there is plenty of scientific evidence for the notion that everything began at a certain point in time and will eventually end. People of faith point to the theory of a beginning and suggest that if there was in fact a *moment of creation, then there must be a Creator.* Their logic is that "something can't be created out of nothing."

We might call this the "Creator Hypothesis." It assumes a transcendent being created the universe, and us. This being stands outside of the Creation and has the ability to intervene in it, suspending natural law and causing miracles to occur.

Cosmologists like Stephen Hawking have countered this argument with proof that "something *can* be created out of nothing." The details of how this can be done are not so important here, only the fact that respected astrophysicists say it is possible.

This conflict ends in a standoff. Religious people have an inherent aversion to any body of thought that excludes a divinity of some kind, while the scientifically oriented do not want to depend on a Creator for an explanation of how the world works. To me, both positions have significant limitations that I choose not to accept.

The salient point is this: the Creator Hypothesis assumes a larger whole of which human beings are a part. Those who hold to this theory give the "whole" a name and *in fact* call it "holy." Even more to the point, they believe that this divine entity is aware of what He or She has created and cares about that creation. Those who believe in this perspective have a certain amount of faith in their assumptions, though they may at times insist that they can prove the validity of their claims with a form of science. Scientists counter by calling it "pseudo-science."

The Cosma Hypothesis proceeds along a different path, working more from reason than faith. It does not assume the existence of a Creator of the universe. However, it does not deny that He or She may exist.

Our hypothesis only assumes that there is at least one universe (there may be many others), and we call it Cosma, rather than "the cosmos." From there, we describe certain attributes of that universe. Thus, it may be that there are many universes, and it also may be that there is an entity who created Cosma, and all the other universes. We do not really address those issues because our concern is *the human place within Cosma.*

The similarity between the two hypotheses is this: both assume a larger whole of which human beings are a part, whether it is called God, or

Cosma. As noted, earlier, most renditions of the Creator Hypothesis believe that God not only created human beings (and the universe) but also cares about us and continues to have a relationship with us after our physical bodies die.

The Cosma Hypothesis does not rule out this possibility, but takes a slightly different tack. It suggests that through the process of evolution, the universe may indeed have brought human beings into existence by creating the conditions in which life and intelligence can emerge. To some extent, we know this to be true scientifically. More than one observer has noted that "we are made of starstuff." Carl Sagan put it well in the TV series "Cosmos:"

> The nitrogen in our DNA, the calcium in our teeth, the iron in our blood, the carbon in our apple pies were made in the interiors of collapsing stars. We are made of starstuff. (9)

This means that the elements making up our bodies (and our brains) originated in exploding supernovas, light-years away from Earth. Therefore, our very existence connects us to Cosma in fundamental ways.

If it is true that the entire universe is made up of information and that evolution is the development of increasingly sophisticated information processing capabilities, then life and intelligence would eventually come into being. As Carl Sagan has also said: "We are a way for the cosmos to know itself." (10)

I could not have said it better and I suppose this is another way of stating the Cosma Hypothesis. However, using my own nomenclature, I would have said, "Human beings are a way for Cosma to know herself."

Thus, we find that both hypotheses view us as part of a larger whole system and assume that this larger whole system has helped in various ways to bring us into existence. The idea that Cosma cares about us is a bit of a stretch, but it could be possible that the universe has a sentience beyond our own and does care in some way. (I use a personal name for the universe to keep this possibility open in the minds of those who are exploring the idea.)

Another perspective is that the universe would benefit from human beings flourishing, while becoming wiser and more successful because the universe as a whole will benefit from that process, and that is why our existence and evolution has been encouraged.

There is one major difference between the two hypotheses, and it is obvious: those who have a belief in a divine Creator assert that this entity created the universe and stands outside of it as both omniscient and eternal. He/ She can also intervene in the evolution of the universe and suspend natural law, and there is no assumption that Cosma can do that. As we explore Cosma further, we may conclude that there is evidence for this kind of observation and intervention, but we don't need to have it as a tenet of the hypothesis right now.

So I am willing to accept this distinction without question and move on from there. It seems to me that this is where science and logic part company with faith and belief, and there is nothing wrong with that.

In other words, the universe can be everything I have said it is, and I can accept the possibility of an infinite and eternal being who created the universe. I can also live with the argument that, as Stephen Hawking asserts, the universe is "something created from nothing." (11)

As I have said in other works, if such a being has created the universe, then the purpose of space exploration from a spiritual point of view is to *know the Creator more fully.* From a religious point of view, that seems perfectly reasonable and worth pursuing.

The beauty, order, and coherence of the Creation is awe-inspiring, and many astronauts have attested to this fact. Awe is a part of most religions and there is a kind of spirituality in the feelings expressed by some astronauts after their flights.

On the other hand, if the universe simply *is,* and there was no Creator, then the awe and respect we have for it should not be diminished in any way. If, as I will argue, the universe has created the conditions for humans to come into existence and to serve larger purposes as well as our own, then we should see that as being pretty impressive, too.

Therefore, I am going to leave the arguments between scientists and religious people to them. In this book, my focus is on how human space exploration fits into the larger whole system we are calling Cosma.

As I have considered the work I did some 35 years ago and have begun to update it, I have found that numerous other thinkers have trod the same path and come to similar conclusions. I will be sharing their thoughts throughout the book.

Serendipitously, Ricardo Cortez has been developing some "first principles" of his own in parallel with me. Cortez is manager of a billion-

dollar money management company, has an avocation in physics, and has been invited to spend time at CERN.

Here is some of what he has said about his principles and the Cosma Hypothesis:

> I believe that these principles…provide a firm philosophical foundation for the Overview Effect. They support the observation that there is a deeper relationship among all things in the universe and explain why this relationship exists, in light of Einstein and quantum physics.
>
> The principles also lay the groundwork for the Cosma Hypothesis. If the universe is interconnected as a whole and there is an element of probability in all interactions, then what is the role of consciousness? If the universe is a living information system, then in what sense is the universe "alive?" I believe that these principles provide a logical framework for the Cosma Hypothesis. (12)

I found it encouraging that someone else had taken such a similar approach to mine and had come to similar conclusions, which seem to confirm the validity of both the Overview Effect and the Cosma Hypothesis.

The notion that the universe constitutes a living system is not original with me. Duane Elgin, author of *The Living Universe,* has an entire book on this topic. While it is not central to his thesis, he recognizes that astronauts caught a glimpse of this reality while in space:

> A feeling of profound and intimate connection with nature and the universe is a theme that emerges from reflections by astronauts. (13)

(Elgin goes on to cite a quote from Gene Cernan that is word-for-word what Cernan said to me when I interviewed him.)

Elgin goes further than I do, in that he seems to assert that the entire universe is alive. The Cosma Hypothesis only asserts that the universe is alive because of what we know is taking place on the Earth.

What is perhaps most important in Elgin's work is how he describes the *implications* of viewing the universe as being alive, or its converse, being nothing more than (dead) matter. If we experience ourselves as part of a cosmic web of life, it propels us toward a more collaborative, communal

view of everything we do. If we experience ourselves as part of a lifeless collection of randomly created (and separate) bits of matter, then an exploitative approach is quite reasonable. (14)

Since it is unlikely that we will find a final, definitive answer to the question "What is the fundamental nature of the universe?" we are ultimately left with a choice, understanding that choices have consequences.

For example, the Indigenous peoples of North and South America took more of a "living universe" approach before the Europeans arrived in the 15th century and thereafter. The immigrants to the New World, shaped by the early stirrings of the scientific revolution and by their religion, tended to take the "dead universe" perspective. The results are well known and do not need repeating here. (15)

While I thought the Cosma Hypothesis might be radical when I first began working on it, my friend and colleague Kevin Kelley has been providing me with evidence that this is not so. In addition to insisting that I read Duane Elgin and similar thinkers, he sent me an article on "panpsychism" that is confirming of the hypothesis.

According to the article:

> Consciousness is a fundamental feature of physical matter; every single particle in existence has an "unimaginably simple" form of consciousness, says Goff. These particles then come together to form more complex forms of consciousness, such as humans' subjective experiences. This isn't meant to imply that particles have a coherent worldview or actively think, merely that there's some inherent subjective experience of consciousness in even the tiniest particle. (16)

Even more consistent with the Hypothesis is that panpsychists find themselves aligned with Tononi and his integrated information theory:

> One of the most popular and credible contemporary neuroscience theories on consciousness, Giulio Tononi's Integrated Information Theory, further lends credence to panpsychism. Tononi argues that something will have a form of "consciousness" if the information contained within the structure is sufficiently "integrated," or unified, and so the whole is more than the sum of its parts. Because it applies

> to all structures—not just the human brain—Integrated Information Theory shares the panpsychist view that physical matter has innate conscious experience. (17)

Kevin also recommended the work of Brian Thomas Swimme, who focuses not so much on the aliveness of the universe as the fact that it is evolving, as are we:

> The great discovery of contemporary science is that the universe is not simply a place, but a story—a story in which we are immersed, to which we belong, and out of which we arose. (18)

The story of which Swimme speaks is that of evolution, of increasingly complex forms arising out of simpler forms. As he also notes, it is a journey and we are on it, like it or not!

I am not deterred by the fact that other thinkers have tackled the problem I am addressing in this book. Each of us brings a slightly different focus to the topic and this will produce different results for our readers. However, it doesn't matter if the Cosma Hypothesis is totally new. What matters is "Does it speak to you?" and "Does it change how you view space exploration, the universe, and your own life?"

As I have worked on this project, I have realized that the goal is to create what my late friend and colleague Jeff Stamps called a "conceptual tool." As I see it, a conceptual tool is a mental framework that is used to better understand reality. When we think of tools, we don't ask if a hammer, for example, is "true," only whether it does the job. Moreover, for any particular job, we may need a wide variety of tools. A hammer alone is not enough to build a house.

Similarly, Duane Elgin, Brian Swimme, and I may develop different tools for understanding the universe, but our objective is the same: to devise the most effective one and to devise enough of them to build a structure that will last for a while.

All this having been said, critics may deride my decision to use the term "Cosma" instead of "universe," because it makes the universe personal. However, that is precisely the point, isn't it? Naming is part of creating a conceptual tool and it will be easier to use this one if it has a name.

Now, let’s look in more depth at what the astronauts have had to say about it.