

WHY THE
UNIVERSE
IS THE WAY IT IS

HUGH ROSS



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Introduction

Let's Play "I Spy"

This book is about purpose—actually *purposes*. Some are obvious, others veiled. Some remind me of the *Where's Waldo?* books my sons used to enjoy, or the “I Spy” computer games my young nephew plays. The purposes may be difficult to see, but they're there.

Many of the latest scientific discoveries bring these hidden purposes for the universe's existence, structure, and history into view for the first time. Seeing them helps explain why we're alive at this juncture in cosmic history. More importantly, it provides insights to humanity's ultimate destiny.

The most obvious purpose now recognized by the majority of astronomers for the origin, characteristics, and history of the universe is to provide a suitable home for physical life—humanity in particular. Famed British theoretical physicist Stephen Hawking described this observation in *A Brief History of Time*, the bestselling science book of all time:

It would be very difficult to explain why the universe should have begun in just this way, except as the act of a God who intended to create beings like us.¹

American physicist Freeman Dyson expresses this same impression:

The more I examine the universe and study the details of its architecture, the more evidence I find that the universe in some sense must have known that we were coming.²

Hawking, Dyson, and many other distinguished physicists emphasize the realization that only in the context of human existence does the universe make any rational sense. *Why* this is so, however, puzzles even the greatest minds. Albert Einstein has been widely quoted as saying, “The most incomprehensible thing about the universe is that it is comprehensible.”³

Some features of the universe, nevertheless, seem strangely contrary to what’s “best” for humanity (see chapter 1). These incongruities cause many scientists and others to question whether or not the universe could have been divinely or benevolently designed to provide a home for life and humanity.

Over the past four hundred years of scientific research, a pattern has emerged that bears upon this question. It appears that even the best explanations for a phenomenon or system under investigation must acknowledge some anomalies, and yet these seeming discordances don’t necessarily negate that explanation. The misfit findings simply remind us that human investigators lack perfect and complete understanding of any phenomenon or system we may study. Scientists also have learned that anomalies serve as springboards for gaining new heights of understanding. So far, most bothersome incongruities, once understood, reveal previously unrecognized purposes—benefits initially overlooked.

On a cosmic scale, researchers’ experience with apparent inconsistencies implies that more purposes likely exist for the universe and its features than simply to provide life and humanity with a comfortable place to live. This book digs into these paradoxical features of the universe with the intent of uncovering their less-than-obvious purposes.

The goal of such excavation goes beyond satisfying my own and others’ curiosity about the universe. I am firmly convinced that by discovering the intentionality behind the universe, we gain

increasing insight into and confidence in the ultimate purposes for our own brief lives on this pale blue dot called Earth.

The first part of this book examines the widely perceived enigmas of the universe to determine from a scientific perspective each one's underlying significance for humanity's existence. These findings offer readers a fresh perspective, a new vista from which to contemplate why the universe manifests the puzzling features it does.

The second part of this book explores how the Bible accurately and uniquely described the major features of the origin, structure, and history of the universe thousands of years before any scientist discovered them. At the same time, the Scriptures stated both implicitly and explicitly the Creator's purposes for the universe and its attributes. The predictive success of biblical cosmology affirms the reliability of Scripture's message about why the universe exhibits the characteristics it does. The Bible is as relevant today as ever. Thus, Part 2 integrates the biblical explanation with the scientifically determined explanation of why the universe is the way it is.

This combination of scientific and biblical reasons for the universe and its features yields a solid foundation for the ultimate hope, purpose, and destiny of each and every human being. My intent in writing this book is to provide more than a measure of understanding of cosmic perplexities. I want readers to take away a renewed appreciation for the awesomeness of the universe and especially for the value—and eternal destiny—of their lives. Discovering the hidden purposes for the universe will stimulate an eager anticipation of all that lies ahead—beyond the universe we now see.

1

Why Ask *Why* Questions?

Self-preservation—it's a powerful drive we humans share with every other creature on the planet. In addition to being highly motivated to do whatever we can to preserve our physical lives and enhance our physical well-being, people express a motivation not seen in any other animal species—a yearning for a sense of purpose.

This urge compels humans to ask questions, BIG questions. In *A Brief History of Time*, Stephen Hawking, the world's most famous physicist, expresses this compelling desire:

We want to make sense of what we see around us and to ask: What is the nature of the universe? What is our place in it and where did it and we come from? Why is it the way it is?¹

Many people besides physicists yearn to know the answers to these questions.

The Search for Answers

The fact that you're reading this book says something about you. You're someone who hasn't relinquished the curiosity you

were born with even though many people seem to let it go as they grow into adulthood. Why have you remained curious? Perhaps it's because you have some measure of confidence that meaningful answers can be found. Somehow that confidence—or longing—has been kept alive.

The fact that I'm writing this book tells you something about me. Curiosity is a driving force in my life—one so powerful it could have brought me to harm. While trying to investigate the structure of a hornet's nest, I learned the importance of a good throwing arm and fast legs. While venturing across Vancouver, Canada, on foot to explore the nearby mountains, I learned, sometimes the hard way, the importance of keeping track of the Sun's position in the sky and of setting up landmarks to guide my return.

Many people can recall similar experiences. These curiosity-inspired explorations suggest that human motivation to seek answers to their questions, big or small, may sometimes be even stronger than the powerful drive for self-preservation.

A simple *why* question launched my career in astronomy. One starry night when I was seven years old, I asked my dad and mom, "Are the stars hot?" (Though I don't remember the details, I suspect an earlier experiment involving a fingertip and a lightbulb prompted my query.) Their unified "yes" generated my second question: "Why?"

Wisely, my parents told me I could find the answers at the library. And I did. Books revealed some answers and prompted more questions. More answers led to still more questions. And that process continues to this day. Along the way I've discovered that *why* questions about the universe spring from two distinct sources.

Scientific curiosity arises from the desire to understand the way things work. People want to understand how things like gravity, electricity, and magnetism—as well as living organisms—function. That type of curiosity stimulated Newton's question about why apples fall to the ground, Darwin's question about why the finches on one of the Galapagos Islands had larger beaks than those on another, and my question about why the stars are hot.

Spiritual curiosity is driven by the quest for meaning and coherence. This source of cosmic *why* questions combines reason and

imagination, logic and speculation. Some of these questions are simple (though not easy) and direct: Why do I exist? Why does anything exist? Why do I care? Even people whose daily struggle to survive leaves them little time, energy, and opportunity to pursue answers somehow can and do discover amazing insights that bring them a large measure of peace, contentment, and hope.

On the other hand, many people of great intellect, solid education, and substantial financial means neglect the grand questions of life. They complain about the state of the universe and their present predicament within the vastness of the cosmos without putting their resources to use in an attempt to find satisfying answers.

Though my family was poor by Western standards, we had a wealth of access to nature, to thinkers, and to books. And because my family never embraced any particular philosophy or religion, I had great freedom to explore the big questions of life. My neighborhood offered a rich diversity of Eastern and Western belief systems, spiritual and secular. As a teenager I read manifestos, philosophy texts, and many so-called “holy books” with the skeptical eye of a budding scientist.

After months of intensive investigation, I couldn’t escape the stunning (and unique) consistency of the biblical texts with scientists’ emerging discoveries about the universe, with natural history, and even with current events in human history.

Finally I had to acknowledge the obvious: no human mind or collection of minds alone could have produced the sixty-six books of the Bible. These books contained information their writers couldn’t have known and concepts they couldn’t have begun to imagine apart from supernatural inspiration.

And, even more thrilling for a scientist, the books of the Old and New Testaments made statements and predictions that could be tested. They literally invite testing! Deuteronomy 18:21–22 encourages readers to disregard any message given by someone who claims to speak for God if that message is not totally accurate. The New Testament book of 1 Corinthians says that if Jesus of Nazareth did not actually rise from the dead (as confirmed by eyewitness accounts), then any preaching or faith concerning him is in vain (see 1 Cor. 15:12–14).

The apostle Paul clarified this careful approach in his first letter to the Thessalonians: “Test everything. Hold on to the good” (1 Thess. 5:21). The Bible calls for an exploration of the truth with eyes wide open and mind engaged. Permitting scientific and spiritual curiosity to work together sets people free to run toward, not away from, the complex *why* questions.

To Address Complaints and Concerns

Between the ages of seven and nine, I read as many books as I could on astronomy and the history of astronomy. During my teenage years I was surprised to learn that the objections to a “created” universe raised in centuries past were the opposite of those being voiced in the twentieth century.

About Size

Previous to the twentieth century and the building of telescopes that can clearly see galaxies beyond the outer limits of the Milky Way, scientists and philosophers tended to complain that the universe was far too small to be the work of God. While acknowledging that the existence of the universe implied some kind of cosmic Creator, these researchers deduced that the Creator could not be very big or strong. If God were all-powerful and infinite, surely, they reasoned, he would have created an infinite universe or at least a much larger universe.² These concerns raised doubt about the existence of a biblical cosmic Creator.

The arrival of the twenty-first century and telescopes powerful enough to help us see back in time (see “Looking Back in Time,” p. 21), even as far back as the initial moments of cosmic existence, has prompted a very different kind of complaint from scientists and skeptics. The universe as now measured appears absurdly too large to serve merely as humanity’s home. Skeptics insist that a Creator, especially the biblical Creator, wouldn’t make unnecessary matter and space or waste creative effort.

Historically, the same type of back-and-forth dissatisfaction has been expressed about Earth’s size. In the fifteenth and sixteenth

Looking Back in Time

Because light takes time to travel through space, astronomers never witness the present. They only measure the past. For example, when astronomers observe the Sun, they see it not as it is now but rather as it was about eight minutes and twenty seconds ago (the amount of time required for light to travel from the Sun to Earth). Likewise, because the Andromeda Galaxy lies 2.1 million light-years away, we see what was happening in the Andromeda Galaxy 2.1 million years ago (see figure 1.1).



Figure 1.1. The Andromeda Galaxy as It Appeared Long Ago

This image reveals what the Andromeda Galaxy looked like 2.1 million years ago. Since then, the dwarf galaxy situated above and slightly to the left of the nucleus of Andromeda has moved even farther away from the nucleus. Its movement has contributed to the warping of Andromeda's spiral arms. Between the epoch captured by this photo and today, about 40,000 supernova eruptions have occurred and to some degree altered the Andromeda Galaxy in ways that cannot yet be seen. (Image courtesy of Corbis)

Thanks to modern technology, astronomers today have access to images that show what was taking place in the universe many billions of years ago. Several independent measures establish with a high degree of certainty that the universe is, indeed, 13.73 billion years old. Astronomical images now cover the entire span of cosmic history. In other words, astronomers can directly observe all of cosmic history from its beginning until the present.

Such observational capability explains why some of the most compelling scientific evidences for the existence and attributes of the Creator arise from the discipline of astronomy.³ (If you are concerned that a universe billions of years old may be incompatible with a literal interpretation of the Bible, see appendix A: Biblical Basis for an Ancient Universe and Earth, p. 207.)

centuries, explorers, merchants, and kings expressed displeasure that India and Indonesia were so distant from Europe. Surely an all-loving, all-caring God could have blessed humanity with a small enough planet to make for more convenient trade routes.

Today people complain that Earth provides humanity with too little living space. They claim that an all-loving, all-caring God would not have confined humanity to the surface of a few continental landmasses on a relatively small planet. The thought that God would taunt humanity with the vastness of the cosmos and an impulse to colonize, while at the same time shackling us with physical laws and dimensions that deny any realistic capacity to spread our peoples and civilization to other bodies throughout the universe, seems mean-spirited.⁴

These grievances about the size of the universe and of Earth may say more about the arrogance of humanity than about the deficiencies of the Creator. Chapters 2 and 7 tackle the good reasons, as currently understood, for the vastness of the universe and the minuteness of humanity's habitat.

About Age

People also wonder or grumble about the age of the universe. Now that astronomers have determined the universe's age to be 13.73 billion years, many scholars and laypeople ask why, if God's goal in creating the universe was to provide a home for humanity, he took so much time. They suggest that an all-powerful God would have set up everything all at once (or simultaneously).⁵ Even a weak God should have been able to prepare us a place in much less time than billions of years. Chapter 3 examines the question of why the universe must be so very ancient. Chapter 6 considers why the time window for the duration of human civilization, even in a vastly ancient cosmos, must be relatively brief.

About Loneliness

One summer while a graduate student at the University of Toronto, I had the privilege of taking a short course from Carl Sagan. He spoke about the unimaginable loneliness of this vast

cosmos *if* indeed humans are the only intelligent species residing within it. Surely, Sagan reasoned, given the enormous size of the universe and Earth's capacity to support human life, billions of other astronomical bodies must also be endowed with the ability to support physical intelligent life.

Could there be sound reasons for believing we are isolated? More than thirty years after Sagan's speculations, the scientific discoveries discussed in chapter 4 illustrate the likelihood that we are isolated. Chapter 8 examines why physical intelligent life demands a unique planet, moon, star, set of planets, galaxy, and cluster of galaxies. In addition, it supplies observational evidence to support this uniqueness.

About Darkness

One of the most remarkable sets of scientific discoveries of the past decade is the recognition by astronomers that 99.73 percent of everything that exists in the universe is "dark" (see table 2.1, p. 37). These discoveries raise the obvious question of why a created universe would be such a dark place.

In addition to the universe as a whole being dark, astronomers have found that Earth resides in the darkest location within the Milky Way Galaxy where physical life is possible. And our Milky Way Galaxy lies in the darkest location in the universe where physical life is possible. Why? Chapter 5 grapples with the answers to each of these questions.

About Evil

The most serious complaints about the structure of the universe focus on the fact that the cosmos permits suffering, hardship, and evil. From many people's perspective, life appears *too* hard and *too* painful. Both humans and animals appear to suffer more than kindness would allow.

Who among us hasn't asked why an all-powerful, all-wise, and all-loving Creator would have designed a universe so full of horrors and heartaches? Surely such a Creator could have designed the cosmos so people and animals could live in comfort and peace.

Some say all this suffering seems gratuitous, pointless, even sadistic. The skeptic concludes that if God really knew what he was doing when he created the universe, he would have designed humanity's home so that tragedies couldn't happen or, at the very least, so humans would be protected from exposure to evil.

Could any type of pain, calamity, or exposure to evil be considered in some way *good*? Chapters 6–7 and 9–12 provide intriguing insights about the role of hardships and evil as experienced by all living beings. These chapters demonstrate how the present universe is ideally suited for bringing about an efficient and rapid end to all such suffering forever. They also make a case for defining *perfection* in the context of humanity's ultimate purpose and destiny.

About God's Obscurity

Why do so many people who study the universe find it difficult to see God or at least recognize his actions in shaping creation? Couldn't he have made it much easier for humans to see his glory and goodness in the heavens? Does he have to be “invisible,” hidden from objective investigations? Chapter 10 focuses on why the universe might seem spiritually opaque and how, thanks to some new discoveries, God's revelation of himself now manifests more remarkable clarity than ever.

About Life's Mysteries

Perhaps the greatest question about life is why it has to end. Death seems so grievous, final, and unfair—not to mention so painful for those who survive. It appears to defy any concept of a caring and loving Creator. Why people must die, why animals die, why there were billions of years of death before humanity came on the scene, and what possible good could come from all this death are the subjects of chapters 6–7 and 10–11. These chapters also address the question of when and why the universe must come to an end.

Chapter 13 draws from various biblical passages to sketch a picture of the *new* creation, the “universe” yet to come. A glimpse into the future helps make sense of our yearnings for what this current cosmos does not provide.

To Embrace the Incomprehensible

Why is the universe so hugely vast, so unimaginably ancient, so predominantly dark, so irreversibly decaying, so empty of life, and so rife with suffering and evil? These questions deserve thoughtful responses. Many people wonder, as I once did, whether satisfying answers can be found.

As recently as a few decades ago, questions like these were thought to reside mostly in the domain of theology and philosophy. No one denies that these dilemmas are deeply philosophical and theological in nature, and yet scientific findings play a valuable role in either confirming or denying any proposed solutions. China's distinguished astrophysicist Fang Li Zhi declares, "A question that has always been considered a topic of metaphysics or theology—the creation of the universe—has now become an area of active research in physics."⁶ Leading-edge research has opened the way for scientists to add their voices to the discussion of why the universe is the way it is.

Understanding the totality of the Creator's purposes for the universe will always remain beyond the reach of human minds. Even Hawking, with all his brilliance and zeal to discover "nothing less than a complete description of the universe we live in"⁷ and "a complete *understanding* of the events around us, and of our own existence"⁸ and to "know the mind of God,"⁹ cannot realistically accomplish such a task.

I can say with reasonable certainty that humans are not God, nor can we become God. No mere human can know absolutely everything about *any* aspect of the cosmos because people are confined to a limited portion of the universe's space-time continuum. Thus, to gain a complete description and understanding of the universe is impossible. However, such limitations don't prevent those with curiosity from gathering adequate descriptions and understandings.

Many people, including myself, find contentment in "sufficient" answers, answers that become more complete over time, that challenge us to dig deeper and discover more of what *can* be known about the universe and humanity's place within it. I think that's what we all really want—to know *enough* to find satisfaction and make wise decisions.

And I'm firmly convinced we can know enough. Not enough to end all questions, but enough to make sense of our lives. We can build a cosmic perspective solid enough to remain firm yet flexible enough to absorb the impact of new discoveries.

Discovering the hidden purposes of creation can bring more than just a little contentment. Exploring why the universe is the way it is can help us develop a renewed sense of appreciation for the value of this life, an assurance of individual worth and eternal destiny, and an eager anticipation for what lies ahead.

Finding out why the universe is so huge seems a good place to begin.