Introduction: What is the Universe?

On a clear night, step outside beneath the star-flecked sky and listen. If you are far enough from the urban undertow of modern life and stand still long enough to let your thoughts settle, you might feel yourself enveloped in the universe's majestic depth and beauty. As you swim in the luminescent blackness amongst the uncountable stars, you may begin to feel dizzy or disoriented, perhaps feeling your familiar sense of self dissolving or diffusing out into the enormity of space.

At first this might feel disquieting, but if you let the immensity of the silence speak to you, questions may spontaneously appear. What is all this? Where did it all come from? What's it all about? What is it telling me? People have been asking questions like these for at least as long as there have been people looking up at the night sky. Our wonder and our questions, our innate curiosity about the world around us and our role in it, are part of our humanness.

Every culture has been awed by the heavens and asked, "What is the universe?" How a culture – or individual – answers this question becomes the source of their myths, beliefs, and creation stories, which influences how they live in the world. The Wari people of the western Amazon see the cosmos (and particularly the natural world) as imbued with endlessly flowing energy, spiritual intelligence, and power. Time, space, and matter-appear fluid to them, alterable through language, music and ritual. Contemporary western scientists view the universe as the interplay and exchange of matter and energy, combining, changing, and evolving through predictable and comprehensible physical laws. And Vajrayana Buddhism of Tibet discerns multitudes of

universes and worlds within worlds, all interpenetrating and appearing as forms of awareness in an infinite and eternal Mind.

Yet they are all talking about the same thing, aren't they? This collection of conversations explores the question of what are we talking about exactly when we talk about, look at, or inquire into the nature of life, the universe, and everything? Is it matter, energy, God, spirit or mind? Is its occurrence random, purposeful, intelligent, meaningless, or beyond the imagination? The great philosophers, scientists, and poets throughout human history have asked and answered these questions; so why do we continue to address these same mysteries today? Some of my guests suggest that our questioning itself is of the very nature of the universe.

Our answers and formulations to these questions are personally relevant. How we conceive the universe guides our efforts to find and make meaning in our own lives. How we answer these questions on an individual, cultural, or global level – whether consciously or unconsciously – not only forms the basis of our philosophical view of the world, but also influences the ways we act on it and in it – the patterns and rhythms of our daily life. Where our attention is drawn moment to moment is largely based on our values, which ultimately arise from our beliefs about the universe. Where we place our attention day to day guides how we act in the world and creates the underlying fabric of our lives.

Why we continue asking has a practical underpinning. Stop reading and look around you right now. Anything fabricated that you see represents a particular worldview realized into material form. Each crafted object begins as an idea which is formed and shaped according to the skills of people with a specific worldview and set of values. If

the principles of physics were not valued by people in modern industrialized societies, there would be no television sets, computers, or airplanes. If the Wari of the Amazon did not value different principles of existence, they would not create their ritual staffs, masks, and earth shrines. The variety of art, architecture, and crafts among cultures and over time express the many different perceptions of the universe.

Beyond the philosophical and practical impulses behind the Big Questions lies another: the impulse for transformation. The very asking has the power to shift our worldview and change our lives in significant ways. By contemplating the responses and viewpoints of others, we can refine our understanding of ourselves and our unique place in the universe.

I invited my guests into conversation on this topic not in hopes of receiving final answers, but as a path of inquiry, a way of engaging fully with the mysteries of existence. This for many lies at the heart of a fulfilling life. As Emerson expressed, "Were I to hold the truth in my hand, I would let it go for the positive joy of seeking." As we begin asking these questions with a curious mind and a sincere heart, we may eventually find ourselves beginning to “live the questions,” as Rilke suggested. We participate in the world more deeply, in seeking a meaningful relationship with the universe.

But if we begin to ask thoughtful questions such as “What is the universe?” we must be prepared for profound, perhaps unsettling, answers. One individual who was not prepared for the answers the universe gave him in response to asking these kinds of questions was Albert Einstein. Above all the other reasons for his work in physics was Einstein’s desire to “know the mind of God.” With his general theory of relativity, Einstein had found a way to weave space, time, matter, energy, and gravity together into

a coherent mathematical model, an unprecedented achievement in physics still celebrated today. Yet when he and the Dutch mathematician William de Sitter sat down in 1917 to try to apply Einstein's new theory to the structure of the universe, they discovered something unexpected and even more interesting: the universe seemed to be expanding.

In the early Twentieth Century this idea was considered not only revolutionary, it was mind-boggling. Einstein had grown up during a time when the universe was generally considered eternal and unchanging. The idea of an expanding universe was initially too much for him, so he included a "fudge factor" in his mathematics which canceled out the predicted expansion, allowing his equations to more closely match his beliefs about the universe. He had asked the question, "What is the Universe?" but had been unable to believe the reply the universe had given him. He later called this the greatest blunder of his life!

A decade later the American astronomer Edwin Hubble measured the velocities of distant galaxies, empirically demonstrating that the universe was in reality expanding. Soon after, the Belgian priest and astrophysicist Georges Lemaître proposed that not only was the universe expanding, but that what we see today is the "ashes and smoke of bright but very rapid fireworks" – the very beginning of the universe. The universe could no longer remain static and eternal. It was perceived now as dynamic, evolving, with even a beginning!

Enter now the theory of quantum mechanics to up-end our ideas about the physical nature of the world. Physicists were discovering in their laboratories that the basic properties of atomic particles were being altered just by the simple act of measuring them. Soon after it was discovered that, in certain experimental arrangements, particles

at the atomic level do not fully exist prior to being observed. The activity of conscious observation and measurement was actually bringing particles into full existence! This suggests that reality may not be pregiven and "objective," but rather that it is being continuously shaped by our interactions with it. Based on this surprising result and others, many scientists have been led to the intriguing conclusion that mind or consciousness may lie at the foundations of the universe. As the physicist Sir James Jeans said nearly a century ago, the universe "seems to be more like a great thought than a great machine."

The answers to our simple question "What is the Universe?" have changed many times over the past hundred years and are likely to continue evolving in surprising and intriguing ways each time we ask it.

Recent astronomical measurements have provided another unexpected response to this question by showing that the overwhelming majority of the universe is composed of two enigmatic and invisible components, dark matter and dark energy. In other words, the latest response to our question from the Universe is that it is almost entirely something that we can't see, and offering us no idea of what it is! And so the mystery grows as we venture deeper into the universe with our questions, evoking new responses that may sometimes leave us feeling uncertain and shaky as we try to make sense of the insights and revelations of our continuing inquiry.

We might continue feeling dizzy if we join in the current cosmological speculation that our universe may be only one of many universes (multi-verses), eternally and endlessly inflating in a vast void, bubbling up as quantum fluctuations out of literally nothing. Additionally, there may be many more dimensions to our universe than meet

the eye – as few eleven or as many as twenty-six, according to some theories. A recent survey of the scientific and philosophical literature by noted scholar and researcher Dr. Robert Lawrence Kuhn classified at least twenty-seven different explanations for the current observed universe and why things are they way they are[1]. So…what *is* the universe?

One insight into how to approach multiple perspectives on the universe comes once again from Einstein. His special theory of relativity (a 'special' case of the general theory) posits that space and time are not uniform everywhere in the universe, but strongly depend on the observer. Two people moving at different speeds relative to each other will actually see and experience space and time differently. How can the universe not only *look* different, but *be* different for different people? Don't we all live in the same universe? This is more than a scientific question – generations of artists, writers, and philosophers have been deeply affected by Einstein's insight.

Moving deeper into the unfamiliar, Einstein and de Sitter's discovery of the expanding universe implies that the universe is expanding everywhere, and yet has no center. In other words, everywhere is the center of the expansion of the universe (this view is called *omnicentrism*). This means that Chicago, the Andromeda Galaxy, and you are all the center of action for the universe. So modern cosmologists have proposed that the dynamics of the universe are equally present everywhere in the universe (an assumption consistent with current astronomical observations). Then if every place in the universe is the center of its expansion and has the same laws and dynamics as everywhere else, we can learn about the universe from any particular place. We can study Mars or the Orion Nebula to learn about the universe, but we can also study our bioregion or even

– ourselves. Every person and each part of the universe is a valuable source of information about its dynamics and nature. Each of us *is* the universe being expressed in a particular location in a specific way. We're all part of the same moving and evolving cosmos, but the view of it is unique from each of our respective locations. *Hold on to your seats!*

This suggests that the universe is not only omnicentric, but that it is also *multiperspectival* – there are many different, and equally valid, viewpoints on this mysterious phenomenon we call the universe. Astronomy, physics, chemistry, and biology each offer distinct perspectives on the universe, since each is attuned to a different class of phenomena within it. Then we have the gifts of music, literature, philosophy, religion, and the humanities – each also offering its distinctive and unique insights into this evolving universe that we all participate in. Don't forget to add in the insights of other cultures and religious traditions before we undertake any kind of "unified theory" of the universe!

The technique of seeing existence from many different angles in hopes of finding common ground in our shared experience while acknowledging the unique perspective each one brings to the whole, I refer to as "reality slicing." It's like slicing through a loaf of cinnamon swirl bread at different angles, revealing different patterns of swirl in each slice. So many different patterns and possibilities, all from the same bread!

So if it is true, as it seems to be, that the universe is more than what any one of us can say it is, then in order to bring together diverse perspectives towards a common understanding of the whole, we need to first acknowledge that our viewpoint may not be the only "correct" one. We must relax long-cherished preconceptions, beliefs, and

certainties about ourselves and the universe, so that something new may inform them. If we can agree that different perspectives on the universe exist, and that each represents an equally valid viewpoint, then what does this say about the universe we live in? What is the cosmos telling us about itself through the existence of so many different perspectives on itself? How is it that so many people can see the world so differently when we're all part of the same evolving universe? Now wouldn't it be interesting to inquire with people about their diverse viewpoints to find out more about the nature of the universe?

I thought so. I sought them out in various fields and from a range of diverse backgrounds. We met in offices, laboratories, living rooms, cafes, and even parking lots. We talked by phone, exchanged email and letters, and shared insights garnered over the course of entire lives and careers dedicated to asking these kinds of questions. We spoke from theory and experience, about data and speculation, and out of belief and personal revelation. We explored the universe as matter and energy, as form and emptiness, as spirit and consciousness. Our conversations spanned the depth and breadth of space, time and human history, entwining the nature of the cosmos with the threads of science, culture, and the most profound questions of human existence.

As I joined in conversation with my guests – spacious thinkers, disciplined researchers and courageous explorers of the intimate and infinite, I found my own beliefs challenged, my preconceptions revealed, and my viewpoint transformed. These conversations made clear to me that not only does the researcher influence the outcome, but the outcome also influences the researcher. With each dialogue, I felt as if my familiar self and worldview were being softened and reshaped like wax in the sunlight, twisting my perception slightly askew so as to see the world afterwards in a different

light. It was as if I was morphing and growing with each conversation, leaving each interview in a larger space of uncertainty than when I had first arrived, yet with access to more possibilities. What I lost in certainty through these conversations, I gained in awe, wonder, and curiosity.

The final result of these dialogues and explorations is what is found in this book. For convenience, these various perspectives are grouped into three broad perspectives: science, spiritual traditions, and modern cultural thought. None of these categories is by any means completely or fairly represented here, and in many cases my guests span two or more categories with the breadth of their perspective, experience, and vision. Many of them are exemplars of interdisciplinary thinking that synthesizes the results of their field, culture, or tradition with those of diverse and sometimes seemingly conflicting perspectives into a coherent vision. Others have traveled deeply in their specialization, discovering universal truths that interconnect their fields with those of others. Each one brings new insights about the universe, spotlighting our world in a slightly different hue.

These interviews are an invitation to ponder these Big Questions for yourself, to have your worldview challenged, enlarged, and transformed. Perhaps you will find yourself asking, "If this is true about the universe, what does it mean about me and my participation in it?" We are each on a journey of discovery, and as you travel this path you may find that asking the right questions can be just as important as finding the right answers. May your inquiry into and engagement with these questions carry you deep into the heart of the universe and the mystery of your own life, as it has for me.