

Introduction

There is a gaping hole in modern thinking that may never have existed in human society before. It's so common that scarcely anyone notices it, while global catastrophes of natural and human origin plague our planet and personal crises of existential confusion plague our private lives. The hole is this: we have no meaningful sense of how we and our fellow humans fit into the big picture. Are we the handiwork of a loving God who planned the universe? Are we insignificant motes marooned on a lonely rock in endless space? In every culture known to anthropology, people could have answered questions like these with confidence, even though their answers would probably seem quaint or absurd to us now. They knew what their cosmos was like because they lived in a world where everyone around them shared it. We don't.

Despite all we've gained in this scientific age, we've lost something important. Even in a roomful of neighbors, it's highly unlikely that

everyone will have the same mental picture of large-scale reality and even more unlikely that any of their pictures is based on real evidence. We're divided on the most fundamental question of any society: what universe are we living in? With no consensus on this question and no way even to think constructively about how we humans might fit into the big picture, we have no big picture. Without a big picture we are very small people.

Many religious believers are convinced that the earth was created as is a few thousand years ago, while many people who respect science believe that the earth is just an average planet of a random star in a universe where no place is special. *Neither is right*. Both groups are operating within mental pictures of the universe that we now know scientifically are wrong. Meanwhile, global problems are escalating—religiously justified brutality, exhaustion of planetary resources, climate chaos, economic disasters, and more. We function day to day in a high-tech, fast-paced world, but modern technology for billions of users is essentially magical. Astronomy appears to have little relevance. People think of astronomical discoveries as inspiration for kids or a great topic for five minutes of clever dinner party banter, but there's no widely understood connection between what's happening in distant space and us, right here. The truth is, however, that there is a profound connection between our lack of a shared cosmology and our increasing global problems. Without a coherent, meaningful context, humans around the world cannot begin to solve global problems together. If we had a transnationally shared, believable picture of the cosmos, including a mythic-quality story of its origins and our origins—a picture recognized as equally true for everyone on this planet—we

humans would see our problems in an entirely new light, and we would almost certainly solve them. Getting from here to there is what this book is about.

By incredibly fortunate coincidence, there's a scientific revolution occurring today in the branch of astrophysics called "cosmology," and it's revealing our true cosmic context. The meaning of this earth-shaking discovery could transform our minds and thus our world.

Scientific cosmology is the study of the universe *as a whole*—its origin, nature, and evolution. This field has made remarkable progress since the end of the twentieth century in figuring out how the universe works, even though the universe is almost entirely invisible. Everything we can see with all our instruments is less than 1 percent of what's actually out there. Most of the matter in the universe is invisible "dark matter," as scientists have termed it. This and other fundamental discoveries may make it possible to figure out how the universe operates on *all* size and time scales, including our own. From this new understanding we are coming to see how we humans fit into the scientific big picture, what our significance is within that context, and why our current actions here on Earth matter far beyond most people's imagination.

Religious origin stories like the ones in Genesis have never been factually correct about the universe (for example, it was not made in six days), but they served as a cultural cosmology. In lieu of scientific accuracy they offered guidance about how to live with a sense of belonging and how to draw strength from feeling part of a larger, shared presence that could give life's more mundane moments meaning. Modern scientific cosmology, in contrast, says much about dark matter and the

workings of the universe but nothing about how human beings should live or feel. It aims to provide scientific accuracy but not meaning or guidance in life.

This split between science and human meaning is not a reflection of reality, however, but the result of a historical choice made four centuries ago. When Galileo was arrested and convicted by the Catholic Church for teaching that the earth moves, it was a sobering event for scientists all over Europe because Galileo was the greatest scientist of his time and the first scientific celebrity. As a result, leading scientists such as René Descartes adopted—for their own protection—a policy of noninterference with religion: they would make no claims to authority over anything but the material world; they would defer to religion in all questions of meaning, value, and spirit. The church fathers, on the other side, needed to protect themselves from endless battles over future scientific discoveries and the embarrassment of seeing their religious doctrines subverted. They accepted this “Cartesian Bargain,” and the arrangement has been helpful in allowing science to flourish, especially in past centuries. But given the enormous and pressing global issues that confront us, the modern world can no longer afford to maintain this historical fiction and see fact and meaning as automatically separate. We cannot afford to have an accurate scientific picture on the one hand while on the other being guided in our feelings, philosophies, and views of the future by ancient fantasies that stand in for fact but have long since been disproved—because that’s in fact what we’ve been doing. The human race needs a coherent, believable picture of the universe that applies to all of us and gives our lives and our species a meaningful place in that universe. It’s time to reconnect the two different understandings of the word *cosmology*—the scientific

and the mythic—into one: a science-based appreciation of our place in a meaningful universe.

In this book we present the new scientific picture of the universe as visually as possible, but we then venture beyond science and suggest what accepting this new picture might mean for our lives. Our goal is to show how our society might begin to conquer seemingly intractable global problems by filling the gaping hole in our thinking, applying these new ideas, and eventually becoming a new global society with a common origin story.

By helping us come to terms with our place in a dynamic, evolving universe where time is measured in both billions of years and nanoseconds and size is measured both across great galaxy clusters and across the nucleus of an atom, the new cosmology gives us the concepts we need in order to begin thinking in, and acting for, the very long term. It lets us appreciate our significance to the universe as a whole. One of the most frightening problems facing our world today is the large number of people who are using sophisticated, high-tech weapons to violently impose their regional rivalries and narrow religious notions on the whole world—in short, people who are acting globally but thinking locally. This is backwards: we have to think on a larger scale than the one we're acting on, if those actions are to be wise. *To act wisely on the global scale, we need to think cosmically.* And for the first time this is possible.


Earth is incredibly special, more so than anyone imagined before recent discoveries of hundreds of other planets orbiting nearby stars. And our era is an incredibly special moment even on a timescale of billions of years: we are the first species that has evolved with the capability to destroy our planet. Will we do so? Or will we successfully

negotiate over the next two generations a transition from exponential growth in environmentally harmful activities to a sustainable relationship to this remarkable planet, the only hospitable place for creatures like us in the explored universe? The answer could affect not only humanity but the entire future of intelligence in the ultimately visible universe.

A generation ago, the word *cosmic* was only hazily suggestive. Since no one knew what the cosmos actually was, *cosmic* had no precise meaning. When used to modify words like *consciousness* or *perspective* or *identity*, the word *cosmic* seemed flaky if not ridiculous. But today we are beginning to know what the cosmos is from the horizon of the universe to a single elementary particle, so the word *cosmic* can now be understood not in its old, vaguely disreputable sense but as referring *specifically* to the new scientific picture of the universe. Cosmic consciousness is consciousness arising in this universe—whether human or alien—encompassing the new universe picture, and accepting and working from its principles. Cosmic identity is our own identity, based on the specific and fundamental ways that we fit into this new picture. In other words, the word *cosmic* is now legitimate in a way it has not been since the dawn of modern science.

But this book is not about science per se. It's about us and what we as a species need to do, now that we understand for the first time where we are in time and space. It explains the minimum amount of cosmology needed to get across to any interested person, no special background required, the new meaning of "where we are." If your scientific curiosity is still unsatisfied, please have a look at the Frequently Asked Questions section at the back of this book or read our earlier book, *The View from the Center of the Universe: Discovering Our Ex-*

traordinary Place in the Cosmos. The real focus of this book is on the invitation, and in fact the imperative, to free our society from obsolete, dangerous misconceptions of physical reality, open our minds to the new universe, and begin to teach and cultivate the exciting connections between our universe and both our internal sense of power and our external, political outlooks. In short, this is an invitation to create a “cosmic society.”

Many of the pictures in this book are frames taken from videos that are based on supercomputer simulations of key aspects of the evolving universe. You can watch these videos on our website <http://new-universe.org> whenever you see the symbol . There are also additional videos on the website, listed by the chapter of this book to which they are relevant.

The long-term success of our species may very well depend upon our becoming a cosmic society, capable of thinking on the grand scale while acting on the small. A cosmic society is not about zipping around the Galaxy visiting aliens—it’s about expanding our thinking and transforming our actions right here on Planet Earth. It’s radical but simple, and for the first time in human existence it’s within our reach.