

## **Getting Lost in the Universe: Looking for the Needle of Meaning in a Universe of 100 Billion Haystacks**

—Nick Strobel April 2016

A few years ago a student shared with me after class his fears about the astronomy class but he wasn't scared about the math or physics in the class. He was worried about getting lost in the immensity of the universe. Part of what got me hooked on astronomy from the time of junior high school was the immensity of the universe and all those things and places that are way, way beyond what we could possibly experience here on Earth. I got hooked on the awesomeness of it all and went on to get a Bachelors, Masters and PhD in astronomy. However, I can see where one could feel lost in this great big universe and think that an individual life doesn't matter. I think his fear is at the root of many of our concerns and conflicts today. It's because modern science has kicked the feet of our special place out from under us.

Coming from a family where the church played a big part of our lives and that church's teachings placed a great value on each individual life with a special emphasis on compassion and social justice ministry, how did I answer my student? If you aren't a religious person but have a strong desire of compassion and justice work, how could you arrive at the same general place as my answer to my student?

Before I answer those questions, let us take a quick tour through a history of the development of the Copernican Principle, it's application in astronomy and biology, to see what could be so worrisome. In the Copernican Principle, we—you and I—are not in a specially favored position in the universe.

This removal of our special place began in 1543 with Nicolaus Copernicus who put the Sun at the center of the universe instead of the Earth. Our home planet became just another planet orbiting the Sun.

Galileo's observations of the heavens with his telescope beginning in 1609 seemed to support this sun-centered universe idea. At the same time Galileo was observing the heavens in Italy, Johannes Kepler in Prague found that the Sun wasn't at the exact center of the orbits but was instead at one focus of the elliptical orbit.

In 1687, Isaac Newton showed how all the motions in space are the result of the universal force of gravity that works everywhere—on the Earth, as well as, anywhere in space. He unified celestial and terrestrial physics and continued the process started by Copernicus of removing the Earth (and by extension human beings) from a unique position or situation in the universe.

Up to the mid-1910s the Sun still held the special position of being the center of the universe. Then Harlow Shapley showed that the Sun was not at the center of the Milky Way Galaxy. The Sun and we were relegated to a non-descript patch of the Galaxy far from the center.

If our solar system were shrunk down so that Pluto's orbit could fit in a quarter, the next star would be about 80 meters away. The Milky Way would be the size of the western United States. Pretty easy to overlook a quarter in something that size!

In the 1920s Edwin Hubble showed that the Milky Way Galaxy is one galaxy among many. Now we know that there are about 100 billion galaxies in the observable universe. The Milky Way is

off in some forgotten spot in the universe. Scientists are now toying with the idea of a multiverse—our universe is one of many, many universes.

In the temporal realm we're also pretty small. If you shrink the approximately 14 billion year history of the universe into a single year of Carl Sagan's "cosmic calendar", the Earth and the rest of the solar system don't form until September or about two-thirds the way through the cosmic calendar year. All the really interesting life forms aren't coming onto the scene until December.

All of the past 10,000 years of human civilization would be in the last 23 seconds of this cosmic calendar year. Our entire lifetime would be less than a blink of an eye!

In exoplanet research we have found planets that could be even *more habitable than the Earth* because they orbit stars that are longer-lived than the Sun and the exoplanets themselves are large enough to keep their climates stable for a longer time than the Earth can. With super-habitable worlds, *the Earth is not even the best place for life to exist!* Think about this for a second. If our home planet is not a special home for life, what does that say about us?

In biology the Copernican Principle is seen in our development of the theory of evolution. Early ideas of evolution had a progression of increasing complexity of lifeforms culminating in the production of Homo Sapiens (us). We now know that we're but one *twig* at the end of one *small* branch of the big tree of life on the Earth.

Two non-science films that use the findings of astronomy to express the message of our insignificance are the 1955 film "Rebel Without a Cause" and the 1989 film "Jesus of Montreal". Near the beginning of "Rebel Without a Cause", a high school group is at the Griffith Planetarium for a field trip. The planetarium show ends with the Sun blowing up, leading to the destruction of the Earth and all the while the background star field *remains the same*. The presenter wanted to show that *we are so insignificant* compared to the rest of the universe that it *won't even notice* when our entire solar system is gone.

There is a similar message in a scene from "Jesus of Montreal". One of the characters is introduced doing a voiceover for a science documentary about the events leading up to the birth of our solar system and the eventual death of the Sun. The science documentary ends with the elements that made up the solar system being returned to the universe and the narrator says, "When the last soul vanishes from Earth, the universe will bear no trace of [humanity's] passing."

My student's fear about getting lost in the universe is perfectly understandable. In our society we now live with the unease, even fear, that we don't matter in the grand scheme of things. It feels like the system we live in *assumes* that for the great majority of us. It feels like the system set up by the rich and powerful tells us that we ordinary folks don't matter—they'll extract as many resources from us while they can like there is no tomorrow. The message that the 99% of us don't really matter is fueling the anger behind our political campaigns today. People of various stripes feel like they're being left behind and they are lashing out at the mainstream political system.

So how did I answer my student's fear about getting lost in the universe?

A little more background about me: I grew up in a large family of eight boys where the United Methodist Church was a significant part of our lives. I always had a strong interest in science and math but there was no conflict with science and theology because my parents' theology was on

the more open or progressive side. Two of my brothers are ordained clergy in the United Methodist Church and another brother has a masters in systematic theology. Two other brothers got degrees in the natural sciences, one in biology and the other in geology.

In college I struggled to make sense of how science and religion mesh. After years of trying to find some objective source or evidence or iron-clad logical proof, I have found it comes down to *a matter of choice*.

We can either go the nihilistic route and "get ours while the getting is good (or possible)" or choose to believe and act like a human life is significant—ours as well as others.

In my faith background there are a couple of passages from the Bible that show the tension between what the physical evidence tells us and the alternative choice.

In Psalm 103 we find "*Because God knows how we're made; God remembers that we're just dust. The days of a human life are like grass: they bloom like a wildflower; but when the wind blows through it, it's gone, even the ground where it stood doesn't remember it.*" (Psalm 103:14–16, CEB)

But in Psalm 8 we find "*When I look up at your skies, at what your fingers made—the moon and the stars that you set firmly in place—what are human beings that you think about them; what are human beings that you pay attention to them? [Yet] you've made them only slightly less than divine, crowning them with glory and grandeur.*" (Psalm 8:3–5, CEB) I told my student that *for me*, I avoid "getting lost" with the belief described in Psalm 8. Though we are tiny in the cosmic sense and our existence is fleeting, we are still considered to be important. However, you don't need to take the religious route to arrive at pretty much the same place.

If you make the materialistic assumption that the significance of something depends only on its size and how long it lasts, then we don't really matter. But if you make the choice of the alternative assumption, then some tiny things can still be *immensely important* such as your newborn child's fingers curling around your thumb. The brevity of some other things is what makes them significant.

Another movie reference: The scene in the last movie of the Matrix trilogy in which the hero character is fighting to save the last remnant of humanity from destruction by the machine world. The final confrontation takes place in the virtual world called the Matrix.

The bad guy, a rogue computer program called Agent Smith has pounded the hero, Neo, into the ground. By all objective measures, Agent Smith has the upper hand but Neo gets up to continue fighting. Agent Smith asks, "Why, Mr. Anderson, why? Why do you persist?" Neo answers, "Because I choose to".

It comes down to a matter of choice.

If we assume that we really do matter, we are faced with the choice of seeing ourselves as the center of the universe, an end unto ourselves, or to choose the more mature, a more responsible path.

We have to make the conscious choice of Dr. Seuss's Horton ("After all, a person's a person no matter how small!") because there is nothing in the physical world that compels us to make that choice—the choice of being responsible for the well-being of others and by extension, the rest of creation.

In 1990, the Voyager 1 spacecraft turned its camera inward from beyond the orbit of Pluto at about 3.7 billion miles away at the request of Carl Sagan. Looking back at the Earth from that great distance, the Earth is one tiny bluish-white *speck* about a tenth of a pixel in size. That image of the Earth is called the Pale Blue Dot.

Carl Sagan used the image to underscore how tiny the Earth is and how insignificant it seems against the vastness of even our tiny solar system. But yet, that's our home. Sagan noted that that speck is still important and worth taking care of. He said:

"The Earth is the only world known, so far, to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment, the Earth is where we make our stand. It has been said that astronomy is a humbling and character-building experience. There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. *To me, it underscores our responsibility to deal more kindly with one another and to preserve and cherish the pale blue dot, the only home we've ever known.*"

That last sentence is not a scientific statement but a belief statement. Whether this arises from a humanist perspective or from a religious perspective, it is indeed a belief, a base-level assumption from which our better actions and decisions flow. It is that belief that shapes how I interpret the data of what we've discovered from science about us and our place in the universe and why making the effort to discover how the Earth works in order to protect the future of generations to come is worthwhile.

W. H. Auden's poem *More Loving One* gives the right choice:

Looking up at the stars, I know quite well  
That, for all they are, I can go to hell,  
But on earth indifference is the least  
We have to dread from man or beast.

How should we like it were stars to burn  
With a passion for us, we could not return?  
If equal affection cannot be,  
Let the more loving one be me.

—Namaste