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A few years ago, the movie *Contact*, based on the book by Carl Sagan, intrigued viewers with a vision of how alien beings might actually try to make themselves known to those residents of Earth who are inquisitive enough to listen for their messages. In the story, astronomer Ellie Arroway uses radio telescopes, such as the Arecibo dish in Puerto Rico and the Very Large Array (VLA) in New Mexico, to monitor the heavens for incoming signals that could only have originated from intelligent beings sending intentional messages. Despite the skepticism and discouragement other scientific colleagues, Dr. Arroway continues to monitor the heavens, and indeed she does detect an unmistakable pattern in signals heard through the VLA radio dishes. This received message launches Ellie, and in fact the whole world, into an adventure unmatched in human history as the experts decide whether to follow the instructions in the message and make true interactive contact with the alien message-senders.

I watched the film with special attentiveness because, like Ellie, I am a radio astronomer. Often, I have used the VLA to study signals from the heavens—not messages from alien life forms, but radiation emitted from the gas in distant galaxies and in nearby interstellar clouds where new stars are forming. To date, no confirmed message-carrying signal from alien intelligence has been received from any radio telescope, although private groups diligently scan the skies for such greetings. Yet the vast compilation of new astronomical information that scientists have discerned through radio—and all other—telescopes in just the last two decades drastically and forever changed the human view of the universe.

And so I ponder: Have I, too, received messages through radio telescopes? Certainly, I have not received or recognized any coded pulse from an alien life form. And yet, on a still grander scale, I think about the possibility of receiving “messages” from God—the God of the Bible; the Creator and Sustainer of all the laws and grandeur that govern the universe; the God who is personal and who speaks through Nature, through prophets, and through the love and intervention of a Savior. Does this God speak to us, in a sense, through the wonders we discover in the through our telescopes? As I pause to reflect in stillness, listening beyond the clamor of producing works for academic publishing, participating in professional meetings and talks, pursuing funding and grant, teaching, and encountering academic trials of all sorts, the messages I have heard throughout my early career play again in my ears—seven messages that I believe God “whispers” through radio-an-all-telescopes.

I. Seek the mysteries of my handiwork. The radiating signals of marvelous workings in the Universe have emanated for eons, yet only for a few decades have you even barely begun to discover them and to trace them to discoveries beyond your imagination.

Within the last century, knowledge of the universe opened up to a scale never before contemplated by humankind. In the 1920s, following the “Great Debate” of Harlow Shapley and Herbert Curtis and the

subsequent discoveries of Edwin Hubble, it was finally realized and agrees that swirling nebulae of light observed along with stars in the heavens are not located within our own Milky Way galaxy of stars. Instead, it was determined that they must be distinct and separate galaxies located millions, and even billions, of light-years away, rushing away from one to another as the very fabric of space expands. A few decades later, the faint echoes of the very beginning of that expansion-microwave background radiation signals left over from the Big Bang-were discovered by Arno Penzias and Robert Wilson of Bell Laboratories as they grappled with what they thought was simply “noise” in their receivers. This radiation emitted from forming galaxies, and even from near the beginning of time, has been swirling to us and past us throughout all of human history, throughout all the generations and civilizations of great thinkers as they postulated various cosmologies and cosmogonies to explain the universe they could observe. And yet only now have we been able to capture and decode these radiative messengers from the heavens, telling us of other galaxies and even the beginning of time and space. Are we now gaining a complete picture of the universe, or are we just at the beginning of discovery of what the cosmos holds?

II. I take pleasure in your discoveries. My joy in creating is not complete until you see and rejoice in what I have made, and I rejoice in that discovery with you. For when you see the outworking of the forces and processes I have set in motion and the immensity and beauty of time and space, you see something of my character.

We are told in the biblical narrative of Genesis that one of the first tasks God assigned to the first human was to name the animals (Gen. 2:19-20a). One definite sense that God was enjoying the process and the intrigue of finding out what the man would see in each unique creature. The image conveyed in the text is that the man studied the attributes of each animal and bestowed on each a fitting, descriptive name-in essence, the first act of observational science. To the author of Genesis, this was seen as an enjoyable activity to both God and man in an unfallen Edenic paradise. How similar to the task of modern astronomer! We observe objects in the heavens-objects that we cannot manipulate-and we bestow on them descriptive names: spiral galaxy, red giant star, radio jet, dark interstellar cloud. Could it be that after fourteen billion years of evolution of the universe, and eventually of life itself, that God takes joy when we use our developed minds to discover and study wonders of Creation? I believe so, especially when the joy and awe instilled by such discoveries lead to recognition of the presence, majesty, and creativity of the Creator.

III. There is more to the Universe than meets the eye. Keep looking.

When Galileo Galilei pointed an optical magnifying glass toward the heavens, he saw a new world of detail, such as moons orbiting Jupiter, that contributed to a revolution in human understanding of the cosmos. With each large technological advance in telescopes, a new, previously unseen universe opened before us, reshaping and refining our comprehension of the cosmos. The discovery of cosmic radio waves in 1932 by Karl Jansky led to the development of radio telescopes and the discovery of the “radio sky”. Hitherto unknown “radio galaxies” were discovered, many with bipolar outflowing jets larger than the galaxy itself that are spewing material away from galaxy at nearly the speed of light as an exhaust mechanism for material swirling around a hungry black hole at the galaxy center (see Figures 1 and 2). Radio emissions from regions previously simply known as “dark clouds” for their opaqueness suddenly revealed complexes of swirling and fragmenting interstellar gas coalescing into new stars. Similarly, infrared telescopes are now revealing the patterns of interstellar dust, and X-ray telescopes are revealing energetic galaxies; ultraviolet telescopes are telling us of the mechanisms of the sun and of the production of elements early in the universe, and millimeter-wave telescopes are telling us of the mechanism of the sun and the production of elements circumstellar material around other stars where planets may form. Each “newlook” at the sky with different frequencies, different resolutions, and different filters gives us, a

new sky to add to our growing understanding of the cosmos. We must never stop looking; there is always more to learn.

IV. Creation continues. Stars still form.

It is still a surprise to most people to find out that the universe is not static. Through the time machine of light emitted of millions of light-years ago from distant heavenly bodies, we see ancient galaxies tidally stripping one another as they closely pass, sometimes merging in a spectacular display of interacting spiral arms. Stars exploding as supernovae at the end of their lifespan shine as beacons and distance indicators from both faraway and nearby galaxies. Closer to home, gas clouds observed with radio telescopes even in our Milky Way are condensed by the motions of the galaxy or by the remnant compression of a supernova, leading to the collapse of pockets of gas into new stars. These “protostars” shine brightly in infrared and millimeter wavelengths through the dense gas of their nursery. As infalling material accretes onto the forming star, some is ejected by the surrounding magnetic field, creating from each stellar pole outflowing jets streaming across the interstellar cloud and beyond in a spectacular display. Shortly after their birth, large stars brighten the surrounding leftover gas by radiatively ionizing it into colorful nebulae. Eventually, the gas is blown away, and the star shines as long as its inner hydrogen fuel lasts. When the fuel is used up, a large star ends as a supernova explosion, dispersing heavy elements into the interstellar medium and creating a disturbance that can trigger the next generation of star formation. Indeed study our dynamic universe, it becomes clear that Creation is not a static collection of matter, but rather a universe evolving according to the processes and forces set in motion long ago and upheld in stability. It even appears that several cycles of star formation and supernovae were needed to produce the heavier elements we now require for life. Created beauty need not be unchanging.

V. You seek, and yet your findings are gifts from Me.

We study and strive diligently to make new discoveries and to understand more of the universe; surely this is pleasing to our Creator. And yet the ability to comprehend the nature of Nature is itself a gift. Moreover, many of the greatest discoveries of the cosmos (and in my own work) have been unintended accidents, perhaps to remind us that all discoveries are gifts.

VI. Human life is significant because I have chosen it to be so.

One of the puzzles of the cosmos is how to measure the value of human life, given the unfathomable vastness of time and space. One popular measure of our value depends on our uniqueness: Are intelligent beings like us common in the universe? If not, that would seem to increase our “value.” So then the arguments and counterarguments tend to go forward along two opposing lines: (1) intelligent life must be common throughout the universe, given the statistical unlikelihood that our solar system is the only one out of billions of galaxies (each billions of stars) that has components necessary for life to evolve; or (2) we are likely to be the only case of self-aware intelligent life because, given the rather violent nature of circumstellar environments (asteroids, radiation, etc.), our solar system is extremely unusual in its arrangement and has protected Earth from catastrophe long enough for highly evolved life to thrive. However, if one considers other revelations, it appears that our value is not based on our uniqueness as a species. Rather, it lies in the fact that we have been created to have a personal relationship with our Creator (perhaps by evolving to the point where we can begin to comprehend this) and that God has entered our world personally, speaking to us through prophets and rescuing us as Savior. We have a problem accepting this because we forget that the “infinite” goes in both directions, that an infinite God is interested in both vast time and space and in the minutiae of our daily lives, knowing even the number of hairs on our head. This is not a new difficulty, for even the biblical Psalmist had trouble comprehending

this:

When I consider your heavens, the work of your fingers,

the moon and the stars, which you have set in place,

what is man that you are mindful of him,

the son of man that you care for him?

Yet you have made him a little lower than God

and crowned him with glory and honor. (Ps, 8:3-5, NIV)

VII. Work together, and share what you learn. I am more interested in the discoverers than in the discovery!

Here is a message counter to the classic scientific mindset. A celestial object exists whether or not it is being observed and studied by a detached human being. Even in quantum mechanics, where observation actually changes the state of a system, it is the act of observation, and not the inner character of the observer, that matters. And yet to the One responsible for the cosmos, science conducted in human unity and discoveries shared to uplift others are worth far more than "equivalent" discoveries made for selfish gain or unshared with those unable to make such discoveries themselves. As I write part of this essay, I am working as an American at a Japanese telescope atop Mauna Kea in Hawaii for a few nights with my Japanese collaborators and friends. We are studying magnificent outflowing jets emitted from forming stars with one of the world's most powerful telescopes. Just a few decades ago, such cooperation would have been unthinkable. I ponder the horrors of the World War II attacks here at Pearl Harbor and in Japan at Hiroshima and Nagasaki. How much better it is for the peoples of the world to work together, using technology not for war or greed, but to discover the magnificent handiworks of God! How pleased the Lord must be when the magnificent discoveries of the universe are explained to those whose eyes are cast down from the burdens of life, thereby lifting their sights to beauty and awe and hope.

Again, the biblical Psalmist declares:

The heavens declare the glory of God; the skies proclaim the work of his hands.

Day after day they pour forth speech; night after night they display knowledge.

There is no speech or language where their voice is not heard.

Their voice goes out into all the earth, their words to the ends of the world.

(Ps 19:1-4a)

P.S. And a bonus whisper: You are part of something beautiful.

Radio telescopes, and indeed all telescopes, reveal a universe of complexity and beauty that speaks of great care and creativity in its design. This very reality tells us that our lives mean more than simply survival. Indeed, we can even see that God is very good for even choosing to make a universe of beauty

that leads to life, and thus everything good must proceed from God. Even while terrible evil is present and allowed in our world for a time, we can still proclaim, along with the writer of the book of James just as at the beginning of this essay: "Every good and perfect gift is from above, coming down from the Father of the heavenly lights, who does not change like shifting shadows...."

J. Wiseman, *What God “Whispers” through Radio Telescope*, in *Spiritual Information. 100 Perspectives on Science and Religion*, ed. by Charles L. Harper (Philadelphia - London: Templeton Foundation Press, 2005) , pp. 172-178.

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