

First Unitarian Universalist Society of Albany, New York

“Seeking Other Worlds”

Rev. Samuel A. Trumbore April 30, 2016

Call to Celebration

My first week long meditation retreat in 1985 was at the Lama Foundation. [The Lama Foundation](#) is a spiritual community and retreat center adjacent to the Carson National Forest near the town of Taos, New Mexico. Ram Dass was an important part of its founding.

What is notable about this retreat center is that it is at an elevation of about 9000 feet. At that elevation, most people breathe more heavily. I thought that might make watching my breath as I meditated a little easier. It did. But it didn't help with the stiffness in my joints and back much.

At that elevation without a lot of lights nearby, the clear night skies are just amazing. You look out and can clearly see the Milky Way and so many, many stars. It was just awesome to feel part of such a large universe, wondering if someone, somewhere in another world was looking our direction and having the same experience.

I certainly could imagine native peoples experiencing awe where I was standing, looking out into the sky wondering who might be looking back – though they probably wouldn't have imagined other worlds the way we do today. But that experience of looking up and wondering who is out there looking back is a very, very old experience.

And now, we are beginning to discover that there are planets circling suns far away that we can detect that very well might have life on them too. It may be possible that we will detect sentient life forms and we may even be able to communicate with them.

Let us wonder this morning if ET will be phoning us rather than home, as we join together in the celebration of life.

Meditation

Before we look up to the heavens,
Let us look down to the earth,
and honor our mother, our source, our home.

Without you and your enveloping protection
we cannot live even a minute.

Without you we are nothing but
protoplasm, skin, bone and gas.

The plants that grow upon you
feed us, clothe us, protect us.

The creatures that creep upon you
 feed us, clothe us, and protect us.
 The air, water and minerals in and around you
 shield, support and sustain all of us.

To you we offer our undying gratitude, devotion and love.

We know we have taken you for granted.
 We confess we have exploited you for our own gain.
 We regret our profligate consumption of fossil fuel.
 We grieve the mass extinction of species
 that is mostly our fault.
 We know we have missed
 enumerable opportunities to treat you better.

Maybe we can't do this by ourselves,
 Maybe we need help to stop abusing you
 as we mine your tar sands for oil

This motivates my prayer to you today.
 You are our mother, you know us better than anyone.
 Show us the way to turn our ways around.
 Show us how to stop hurting you and start healing you.
 Show us how small and vulnerable we are
 that we may realize there isn't
 a planet B out there waiting for us.

Help us to discover the meaning we seek in our lives
 will not be constructed out of your body.
 The meaning we seek doesn't require us to take from you
 but will be found in learning to give to you.

Video

Space: The Final Frontier!

(From Star Trek <https://www.youtube.com/watch?v=vZSTwEnWN5Q>) 1:00 – 7:10

Sermon

Do we have some Star Trek fans in the congregation this morning? I'm definitely a trekkie myself. Though I love Captain Kirk, Spock and Bones, I'd say I'm most seriously dedicated to the Next Generation series and characters like Captain Pickard, Data, Dr. Crusher and the empath Deanna Troi.

Star Trek gave me a vision of the best of what humanity could be as it went about exploring the universe. Not only were all the people of earth united in the Federation, so were many other beings from other planetary systems. While transporter technology, dilithium crystals and warp drive science never made any sense, it sure sounded like it did! Star Trek gave me imaginative ideas of what seeking other worlds would be like - an adventure where no human has gone before.

Beautiful as this vision of worlds beyond our solar system, full of strange creatures and different civilizations might be, I also knew that the only world we knew about that could support life was right here. From what we can measure and detect right now, we are alone in the universe and there isn't anyone else out there that we know about ... at least yet.

Yes, there are and have been sightings of UFO's and stories of alien abductions, but all these reports have been pretty sketchy at best. Swamp gas seems as good an explanation as any. And if there were aliens visiting us, where the heck would they come from? The nearest star system is over four light years away! And using the kind of transportation technology known to science today, getting here from there would take a very, very long time.

One promising possibility of finding life beyond our solar system that started over 30 years ago is called the SETI project - the Search for Extra Terrestrial Intelligence by scanning the electromagnetic spectrums for meaningful signals from space.

Nikola Tesla was one of the first to do this kind of searching in 1890's. He thought electromagnetic waves might be a way to communicate with Martians. In 1924, when Mars was closer than normal to earth, "National Radio Silence Day" was promoted for a 36 hour period from August 21-23. Each hour there was a five minute silence to make it easier to listen for Martian communications with us. At the US Naval Observatory, a "radio camera" was lifted almost 2 miles up to capture signals during the silences. In the 1960's, the first radio spectrum scanning started in the US with stiff competition from the Russians.

The problem then and now is where to look for signs of intelligent life. Remember how long life has been on this planet and how short has been the time we have known how to use radio waves to transmit signals. Because of all the background noise and how quickly transmissions deteriorate crossing great distances (also known as the inverse square law), the SETI folks must point their radio antennas very precisely to have any hope of getting a signal at all.

This is one of the reasons the discovery of planets in other solar systems, called exoplanets, is so exciting. Though they were hypothesized as existing many, many years ago, the first one was detected in 1988 and confirmed in 1992 using our amazing space telescopes.

Mostly we can't see these planets directly because even the nearest ones are a long way away. Scientists have found other ways of sensing the existence of these planets. NASA scientist Dr. John Grunsfeld explains:

There are several key exoplanet detection techniques in use today, with the most prolific being the radial velocity and the transit techniques. The radial velocity technique uses Doppler shifts in the light of a star to detect the tiny wobble caused by a planet orbiting around it. This technique is employed by astronomers to detect exoplanets using large ground-based telescopes around the world including by NASA-funded scientists at the Keck telescopes in Hawaii. The transit technique measures the tiny decrease in the brightness of a star that occurs when an orbiting planet passes in front of it...Other techniques for exoplanet detection and characterization include direct imaging and gravitational microlensing. Direct imaging uses a coronagraph or occulting mask to block light from the central star so the much fainter planet nearby can be discerned... Microlensing uses Einstein's gravitational bending of light to find planets orbiting distant stars or isolated planets free floating in interstellar space.

As of the latest count at the beginning of April, we have discovered over 3600 planets in over 2700 planetary systems. Of these systems, only 20% of them show any signs they might be able to support life as we know it. These are planets that might be able to have liquid water and have enough atmosphere to protect the emergence of single celled life. If the planet is too close to the sun or suns the heat would burn off all the water. Too far away and the water will freeze solid. Only in a very narrow habitable zone can life as we know it get a foothold and begin to evolve. And even if the planet is the right distance from the star or stars at the center of the system, that star needs to burn with a steadiness that doesn't bake and freeze the poor planet.

Now let's be clear most of the planets discovered so far will not be able to support any kind of life as we understand it. But there are a lot of planets orbiting stars. It is estimated that there are 200 billion stars in our Milky Way Galaxy. Current guesses about the number of habitable planets suggests that there may be as many as 11 billion planets out there that might be able to support earthlings. The nearest planet of any kind outside our solar system is Proxima Centauri b which is 4.2 light years away. Of all the planets we've discovered that might have earth like properties, only Kepler 62f looks very promising. And it is 2700 light years away. We aren't likely to be exchanging text messages with them any time soon. One message back and forth would take 5,400 years!

That doesn't mean we might not be able to detect the presence of life on other planets in other ways. As our technology improves, we are going to be able to detect the spectrum of light that passes through an exoplanet's atmosphere which will reveal its chemical composition. If we detect oxygen in its atmosphere, that will be a very significant sign of biological activity since oxygen is highly reactive and doesn't hang around long without some lifeform generating it.

So is ET out there? Grunsfeld says, "...I am confident that it is not a question of whether or not we will find an Earth-like exoplanet, but when."

Being open to the existence of life beyond this planet seems very important because it helps us imagine ourselves as part of something much greater and grander than an isolated fluke on the edge

of our galaxy. Science fiction writers feed our innate human curiosity for what might exist beyond us.

Whatever might be out there, however, is going to be far beyond our ability to contact or interact with ... unless we invent warp drive and sub-space communication technology. Heck our cell phones are better than Captain Kirk's primitive communicator - how long can it be? We will need some new physics first of course.

In the meantime, there are worlds to be discovered here that we don't know much about. If we are looking for new kinds of life, we might start by getting to know extremophiles better. These are organisms that survive and thrive in extreme conditions that would be destructive to most other forms of life. Examples include anaerobes that don't need any oxygen, cryptoendolith that live in microscopic spaces within rocks, hyperthermophiles can thrive in temperatures above 80 degrees Celsius, Cryophiles do fine below freezing, piezophiles like to live at very high pressures deep underground or at the bottom of the ocean in deep trenches, radio-resistant tolerate very high levels of ionizing radiation, and xerophiles need little if any water.

Beyond the extremophiles, we might find life in amazing communities we never suspected of existing. Who knew that the roots of trees allowed them to communicate with each other and send messages back and forth? What about mats of fungi that function as if they are one organism? What about the complexity of communication that happens in herds.

I was just reading about Joe Hutto's life joining and living with herds of mule deer and flocks of turkeys. He has spent his life as an ethologist, someone who learns about the societies of animals. He started as a child befriending mammals and birds in Florida. He would bring them home, especially babies, and keep them in his room until they would grow up enough to leave to join their kind in the wild. He spends his days and sometimes his nights with animals to the point that they become accustomed to his presence and eventually accept him into their community. And I mean joining the herd. He describes being groomed by the deer as they inspect him with their tongues for parasites as he scratches their chests.

Through this intimate familiarity he has discovered how deeply they grieve their dead. He has learned the subtle ways they communicate without words that has amazing complexity. He recognizes the depth of their intelligence and adaptation which they then transmit between generations.

Yes, it is important for us to look for life in other worlds far away. And it is important to recognize the life we have yet to discover right here. Moving to Mars is just not a viable option.

The worst result of looking for life in other places is that it might distract us from protecting the life we have here. The life here needs to be our first priority before we get too enamored with or fearful of imaginary beings from Star Trek. We need not worry about an invasion of Klingons or Romulans any time soon. The neutral zone around us is so huge, I wonder if we'll ever be able to cross it ... unless they materialize and show us how.

May our dreams of other worlds and interspecies cooperation help us to realize those who were not born in this country are not aliens and no human being, no matter where they come from is illegal.

Benediction

WE can't spend an hour talking about space without at least a few words from Carl Sagan. Let us close with a few of them:

“The Cosmos is all that is or was or ever will be. Our feeblest contemplations of the Cosmos stir us -- there is a tingling in the spine, a catch in the voice, a faint sensation, as if a distant memory, of falling from a height. We know we are approaching the greatest of mysteries.”

“Exploration is in our nature. We began as wanderers, and we are wanderers still. We have lingered long enough on the shores of the cosmic ocean. We are ready at last to set sail for the stars.”

And I'll add, as we seek other worlds, let us be worthy of being discovered.