

Birth of the Universe: Ghost Galaxies
Unitarian Universalist Church in Cherry Hill
Sunday, January 7, 2024
Rev. Margret A. O'Neill and Melanie Jones, DLFE

Rev. Margret

Yesterday, January 6, the Christian world celebrated the Feast of the Epiphany, also known as Three Kings' Day or Twelfth Night – the final day of the Twelve Days of Christmas. The religious feast celebrates story of the Magi, wise people who followed the star on their camels, bringing precious gifts, finding their way to Bethlehem and discovering the place where a young mother had recently given birth, an enduring symbol of new hope born into the world.

The word “epiphany” comes from the Greek language, meaning an experience of sudden and striking realization, often describing scientific breakthroughs, religious or philosophical discoveries, and so applying to any situation in which we are enlightened, a new light dawns, and a problem or situation can be understood from a new and deeper perspective.

Seeking the origins of our universe is a journey of epiphany, since our universe began with a sudden, striking event, the Big Bang. Unitarian Universalism celebrates the free and responsible search for truth and meaning, honoring discovery in all its forms, and so as a people of faith we celebrate the origins of the universe, the science of physics and cosmology, the mystery of the big bang, in all our awe and wonder as we contemplate the heavens above us. In reality, this is a celebration of the simple fact that anything exists at all. And that simple fact of existence is the mystery of the big bang, the origin of the universe – before the Big Bang, nothing was, and somehow, everything that exists emerged from nothing, from a state of pure potential. Pure potential, what could be simpler? There was nothing, and then there was everything. End of story.

Well, even scientists cannot imagine that the universe actually went spontaneously from nothing to everything, so they postulate that there was what they call a singularity, a primordial quantum vacuum, an infinitesimally compact spot of potential. This tiniest of spots was somehow the ultimate Nothing and at the same time had All of Everything packed into a space unimaginably small – and then for reasons unknown, the force of gravity (which usually pulls things together) reversed itself to push everything out, creating an explosive outward motion that today we call the Big Bang.

In the billions of years following the Big Bang, the universe organized itself into galaxies, each galaxy a huge collection of gas, dust, and billions of stars and their solar systems, all held together by gravity. In a photo of space, showing what we used to think were all just stars, but which we now know are galaxies, each of those points of light is holding billions of stars, billions of solar systems -- so many sources of light in the universe.

And so we ask, what does it mean to be a human, living in one of those billions of solar systems in those billions of galaxies, in the midst of all those points of light? How are we related to the stars, to the galaxies; to all the matter and to all the emptiness in a constantly expanding universe?

Melanie Jones

Light. We've talked about light a lot over the past few weeks. When we look up at the sky in the night, it's the thousands of little lights that tell us there is something more out there...planets, solar systems, galaxies. The light lets us know that there is life. When a baby is born a new light comes into the world; we know people that light up a room, light up our life. When someone dies, we may say a light has gone out, or that their light has returned to the source. Light is life, and we all possess life.

I think of the song "This Little Light of Mine." I used to sing this song with preschool children, and we had hand motions that we did when we sang. I would ask them to hold out their finger, like a birthday candle. I would tell them it represents their light that lives inside of them.

Or think of a tealight candle. Like the one we distributed a little while ago, and that you are holding in your hand. Turn on your little tealight now, please. Each of us has a light inside of us. It's your light; it's who you are and what your presence brings into the world.

And when we put all our lights together, we become a galaxy. I invite everyone to come forward and place your little candle on the table, all close together, to make a galaxy of our own. Like the bang of the universe, we come into consciousness with a bang. We emerge into the universe with light, like the stars we see above us.

Rev. Margret

The universe is so vast, every time we think we finally know it all, we discover something new and amazing – science is a process of constant epiphanies. Like the magi following a star, we believe that if we keep searching, following the science, staying open to new discoveries, truth keeps revealing itself, that there is always something new to be learned. As theologians say, "revelation is not sealed" -- new truths are constantly emerging.

Unitarian Universalists seek to practice a mature, curious belief, with faith in both religion and science. Faith, after all, does not mean blind acceptance, but rather "that to which I give my heart" – the truth to which I commit. We are people of expansive faith, with a commitment to science and religion as partners in the search for truth.

That brings me to something I just learned about in the past couple of weeks, something called Ghost Galaxies. Ghost Galaxies were first identified using the Hubble telescope in 2012 – just 12 years ago -- and at the time these points of light were so hard to detect that they were thought to be tiny and pristine with so few stars that they seemed to be empty. Astronomers knew the Ghost Galaxies were very old, formed just 900 million years after the Big Bang – but these scientists thought they were empty, burned out, just empty dusty spaces sort of like an abandoned closet.

Then just last month, in December, NASA announced the re-discovery of Ghost Galaxies, using powerful infrared capabilities of NASA's James Webb Space Telescope to penetrate the dust shrouding the ancient galaxy named AzTECC71 to capture a new photo.

These ancient dust-shrouded giants, formed very soon after the birth of the universe, just 900 million years after the Big Bang, are actually on fire with activity, spewing out hundreds of new

stars every year. We were so wrong – Ghost Galaxies are not vacant and worn out, but completely alive with energy and creative power, making new stars every second of every minute of every day. What does it mean to be human in the midst of so much power and creativity? What does it mean to be an earth dweller as we continue to discover new truths in an infinitely expanding universe?

I appreciate the science, and I am good with the idea of a singularity of pure potential, and with gravity pushing instead of pulling, behaving in unexpected ways but it really does not explain the origin of the universe with much more clarity than the religious teachings that have been around for millennia, long before our modern science. Those religious teachings tell us that before there was anything there was a power, a presence, an eternal entity – an entity called by many names in many languages but in our language most often called God or Goddess.

And in many of the stories, that eternal solitary God or Goddess got lonely and decided to create a universe so they would not be a singularity alone. To me that seems like the same story as the science, only with a personality attached. When we imagine the singularity of pure potential as having a personality and feelings, as being lonely and deciding to create all this, it somehow feels more approachable to our human way of understanding things. And in either case – quantum vacuum or divine person -- it is a wonder, a miracle, and a mystery. As physicist Marcelo Gleiser wrote back in 2013, “Sometimes we must have the humility to accept that our modes of explanation have limits, and make peace with what we can do; and marvel at how much we can do without the pretense of knowing ... everything.”

Gleiser’s comment really got me thinking and wondering – How do we find the humility to accept our limits, to make peace with the incomplete nature of what science can understand, and to accept the constantly evolving nature of our knowledge, even as we experience awe at the wonder of it all and marvel at how we can live quite well without the pretense of knowing everything?

Melanie Jones

How did this all get here? How did we get here? What does it all mean? We have some explanations as Margret has shared, but we may never have a definitive, fully realized explanation for the life of the universe, human life, all life. But we know that the cosmos, with all of the gases and dust and particles, came to be, and brought light into the world. And we are here also.

Faith and Religion teaches that we are beings of light. Philosophy teaches the idea of microcosms - that we can use the intricacies of human life as the image of them as small universes to help us understand the large system of the cosmos. Science teaches that we are made of the same elements as the stars- elements like carbon, sodium, oxygen, hydrogen.

We are all stardust; we are all beings of light. We may never have all of the answers, but we can revel in the knowledge that the stars, the galaxies are here; that we are here. And each light in this room is its own universe that makes a beautiful galaxy.

Rev. Margret

In all our complexities, with all the new discoveries, all the epiphanies within and around us, there is good and abundant reason to celebrate the birthday of the universe – to celebrate the simplicity of pure potential, to celebrate our creation by a lonely goddess who longed for a

universe of explorers, to celebrate the power of science and religion to enlighten our stardust existence.

May we be grateful for the mysterious quantum vacuum, the potential that somehow was, the nothing that somehow expanded to create all we know - and for the Ghost Galaxies, energizing our universe and creating new stars since nearly the beginning of time. We can celebrate that for unknown reasons, something went bang and exploded out into everything, about 14 billion years ago, plus or minus about 200 million years. And we remain humble in the presence of so much we do not know or understand, and celebrate that we are part of that miraculous existence, that we have the gifts of consciousness and intelligence with which we seek to comprehend the cosmos and all it contains.

Now we sing Happy Birthday to the universe, and in a little while we will celebrate with a birthday cake at social hour!

Sources

The Origin Of The Universe: From Nothing Everything? by Marcelo Gleiser retrieved from <https://www.npr.org/sections/13.7/2013/03/26/175352714/the-origin-of-the-universe-from-nothing-everything>

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