THEORY OF EVERYTHING
Rabbi Dan Moskovitz – FEB 12, 2016
This sermon is also available on YouTube: https://youtu.be/copIZt37MRM

This past week physicists proved Einstein's Theory of General Relativity. With the discovery for the first time of gravitational waves scientists proved the connectedness of all things.

Gravitational waves, first proposed in in 1916 by Albert Einstein are ripples in the space and time that are produced when black holes collide and stars explore. They are like the ripples created in the water when a stone is dropped on the calm surface of a puddle.

The core idea is that space and time, which seem like different things, are actually interwoven. Space has its three dimensions: length, breadth and height. Then there is a fourth dimension, which we call time. All four are linked in a kind of giant cosmic sheet. If you've ever heard a character in a science fiction movie mention "the space-time continuum", this is what they're talking about.

Einstein's big idea was that really heavy objects like planets, or really fast-moving ones, can distort space-time. It's a bit like the taut fabric of a trampoline: if you put a heavy weight on it, the fabric bows and curves. Any other objects will then roll down the sheet towards the object. This, according to Einstein, is why gravity pulls objects towards each other.

The waves that were revealed to be observed this past week are evidence of the fabric of the universe flexing.

By studying these waves scientists hope to gain valuable insight into the universe because these waves experience no barriers, unlike electromagnetic waves such as radio waves, visible light, infrared light, x-rays and gamma rays.

Please don't give me too much credit for that explanation of Einstein's Theory of Relativity – all credit belongs to Dr. Google.

The scientific world is heralding this discovery as a moment akin to when Galileo turning his telescope to the sky and opened a window of modern astronomy or Newton's laws of gravity.

I am neither a physicist or astronomer. The closest I come to any of those sciences is that I enjoy reading Science Fiction. But in trying to understand the magnitude of this discovery I was inspired by the passion and enthusiasm of the scientists.

One scientist, associated with the discovery offered this perspective on its significance:

"Every time humans have observed the universe in a new way, we've always discovered something unexpected that revolutionized our understanding of the universe."

As I understand it, its not only that they have proven Einstein's Theory of General Relativity, but also that the method that allowed them to prove it has never been employed before.

Before this discovery we have only been able to SEE the universe. Now we are able to HEAR the universe as well, and hear things that could not be seen.

Columbia University astrophysicist Szabolcs Marka, a member of the discovery team put it this way, "Until this moment we had our eyes on the sky and we couldn't hear the music, [from now on] the skies will never be the same."

Indeed, even as the buzz of observing a new and utterly stupefying wonder of nature begins to fade over the weeks and months ahead, there's a bigger reason for physicists—and all of us—to be thrilled about gravitational wave detection. As science writer Jennifer Ouellette explained:

"We [now] have a way of observing the universe around us without electromagnetic radiation for the first time in history. It's like acquiring a new sense, as if our hearing were restored after a lifetime of deafness.

Einstein's theory has been validated by many observations of predicted events, but no one until now had ever observed gravitational waves/pulses. And this is what the scientists have now observed, through these cosmic reverberations and vibrations.

So what is the religious lesson we learn from all this?

Rabbi Allan Maller explains, "The new discoveries show that the gravitational waves predicted by Einstein's theory of relativity, which governs very large-scale phenomena, are also quantum phenomena."

For more that eight decades this dualism of quantum mechanics and Einstein's theory of relativity has bothered almost all theoretical physicists and cosmologists. The issue is, the two theories are not compatible, so they can't both be right. General relativity says that objects' behaviours can be predicted exactly, whereas quantum mechanics says all you can know is the probability that they will do something.

Einstein wrote: "[In order to explain the universe] It seems as though we must use sometimes the one theory and sometimes the other, while at times we may use either. We are faced with a new kind of difficulty. We have two contradictory pictures of reality; separately neither of them fully explains the phenomena of light, but together they do".

Put another way what troubled Einstein is the belief that there should be one much greater Theory of Everything (sometimes called TOE) that would incorporate and harmonize both theories.

Hundreds of scientists have spent their professional lives seeking a TOE. The film about physicist Stephen Hawkins that won the Oscar last year drew its title from this idea and his life's work to find a Theory of Everything; one unifying theory that explains everything about our universe.

Though it is yet unproven science, religious people and Jews in particular call this scientific faith in a Theory of Everything: monotheism. A belief in a singular God to which all paths of faith and reason lead.

The Shema is our most familiar example of this idea. When we proclaim the oneness of God, we are not only saying that there is just one God, but rather and I think more profoundly that God or holiness is in everything. Our task as human being is to uncover the Godliness that is obscured in our world.

Where is the holiness in a tree, in a cucumber, in a mountain, in shovel, in a melody, in another human being, where is the holiness inside each of us? The Theory of Everything suggest that it is there, that everything is not only a product of God but part of God. We sing this idea we pray this belief, but we have not proven it.

In place of this proof, in place of one unifying theory we operate in a world of dualism. To find God in all things we must separate what is God or holy from what is not. So we bifurcate our experiences and observations: material and spiritual, objective and subjective, secular and sacred, moral and amoral, religious and secular. But we pray, every day in the aleynu, as well as the shema that this dualism will someday be overcome.

Aleynu l'shabeyach – "Let us now praise the sovereign of the universe and proclaim the greatness of the Creator whose unity we are charged to declare…For you spread out the heavens and establish the earth; Your majestic abode is in the heavens above and in the earth below – there is none else."

Why are this Gravitational Waves significant to religion? We now have the first scientific evidence that there is indeed a basic connection between the microcosms and the macrocosms. Between the heavens above and the earth below, *b'shamayim m'maal, v'al haaretz metachat – ayn od.*

Although the TOE itself has not been discovered yet, and might not be discovered for decades or even centuries, we have external objective evidence of its presence, and renewed confidence that it will someday be discovered.

As David wrote in the Psalms, "The heavens declare the glory of God. The universe proclaims God's handiwork." (Psalm 19:2) Today they do it through a harmonic rhyme we have heard for the first time.

If two black holes can collide and combine a billion light years away and we can feel the rippling waves of that cosmic stone dropped in an ocean of stars here on earth then its stands to reason, and for us to prove that what we do to and for each other sends rippling waves into every corner of the universe and every bit of matter therein.

God or Godliness is in everything and everything is connected. What we do and what we don't do matters, not only to us but to the entire universe. There is unity, structure, beauty, and meaning in the world, and you and I are part of that, inseparable from it and our actions and inactions affect in ways large and small and infinite. So act wisely, the universe is listening.