***D'var Torah* for *Parshat Trumah*: And Let Them Make Me a Model of the Universe**

For as long as people have looked up into the sky, they have tried to understand how the universe works. From Copernicus to Newton to Einstein, describing the universe using models has been a powerful way to take the vast distances and incomprehensible relationships among the heavenly bodies, and make them concrete and understandable for people.

Hundreds of years before Copernicus, rabbis were trying to do the same thing. And they drew insight from this week's parashah and the description of the *Mishkan*. However, Before giving us the details of how to build the Mishkan, God commands the following:

וְעָשׂוּ לִי מִקְדָּשׁ וְשָׁכַנְתִּי בְּתוֹכָם׃

Let them make Me a *Mikdash*, that I may dwell among them.[1]

Now, it's not immediately clear what a *Mikdash* is. But, in the very next verse God tells us that a *Mikdash* (whatever that is) should be modelled after the *Mishkan*:

כְּכֹל אֲשֶׁר אֲנִי מַרְאֶה אוֹתְךָ֗ אֶת תַּבְנִית הַמִּשְׁכָּן וְאֵת תַּבְנִית כָּל־כֵּלָיו וְכֵן תַּעֲשׂוּ׃

Exactly as I show you—
the pattern of the *Mishkan* (Tabernacle) and the pattern of all its furnishings
—so shall you make it.[2]

This has inspired rabbis to ask again and again two questions:

1. What is a *Mikdash*, and what is its relationship to the *Mishkan*? (the Tabernacle)
2. What does it mean for God to "dwell among them"?

I would like to suggest that a *Mikdash* could be a scientific model. And that this command from God is an invitation to understand God's Creation by creating models for it and then to find God within those models.

And I'm not the first to suggest this. Rabbeinu Bahya explains that the Tabernacle was a model for the universe.[3] The Tabernacle was divided into three regions: An outer courtyard, an inner courtyard, and the Holy of Holies. And each region was an analog for part of the universe.

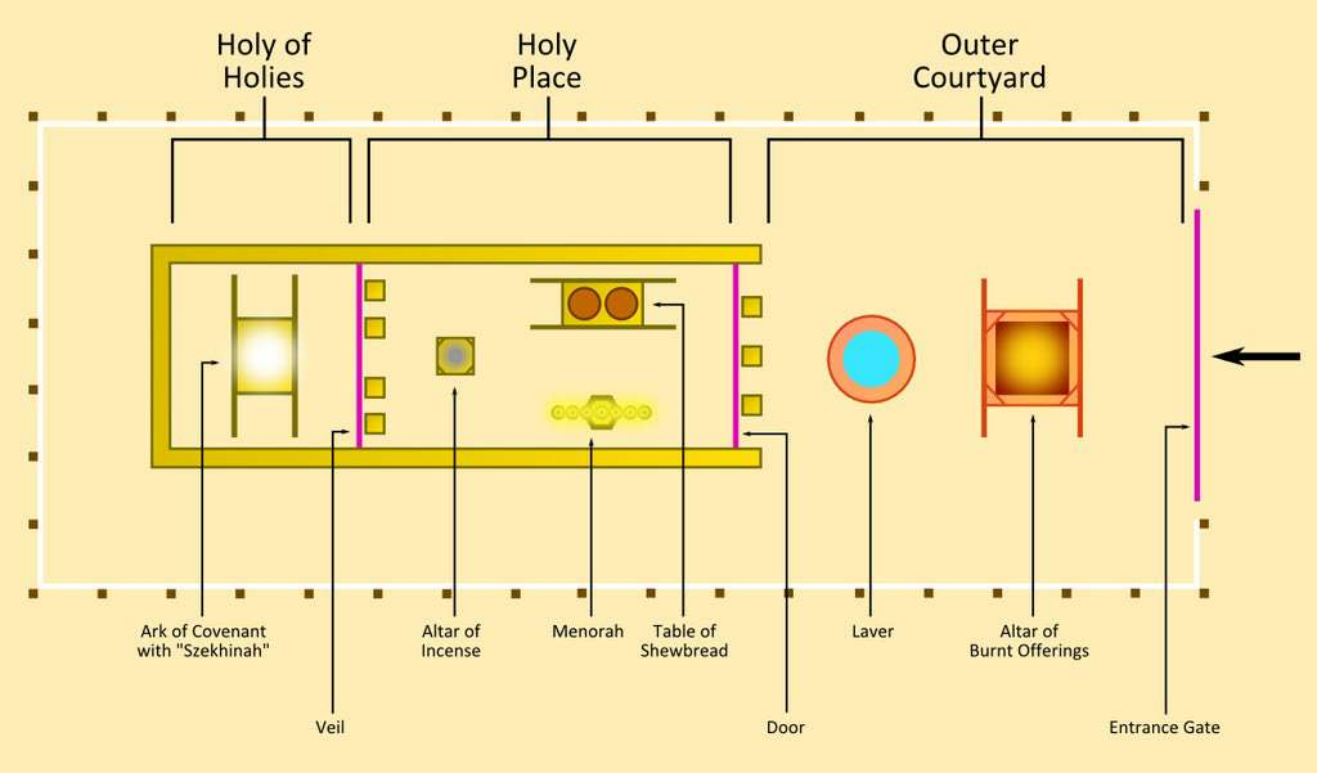
The outer courtyard was analogous to the everyday world we live in. Just as the Earth is accessible to people, the outer courtyard was accessible for most worshipers. And their sacrifices would take place

[1] Exodus 25:8
[2] Exodus 25:9
[3] https://www.sefaria.org/Rabbeinu_Bahya%2C_Shemot.25.9.1?lang=bi

on an alter in this region – a dramatic reminder of the realities of life and death that exist in the terrestrial world.

The inner courtyard was analogous to the part of the universe that we can see when we look up at the heavens – the stars and the planets. A typical worshiper, while visiting the outer courtyard, would be able to peer into the inner courtyard, though they were not permitted to enter. They would see wondrous furnishings – the *Menorah* with its lights and the incense burning on the alter creating clouds of gas. Similarly, we can look up at the sky and see the stars and planets. We can look through a telescope and capture breathtaking images of galaxies and nebulae. And just as the inner courtyard was accessible to only a few priests, travelling even a short distance into outer space is a privilege experienced by only a few humans.

The Holy of Holies, containing the Arc of the Covenant, was a region that was completely off limits. (With the exception of the high priest once per year on Yom Kippur.) It was hidden behind a curtain. No-one could see what was inside, no matter how hard they tried. This was a region of total mystery – analogous to the region of the heavens where the angels and even the *Shekhinah* might dwell.



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[4] When presenting this D'var Torah, all images were printed on large poster boards displayed on an easel so the congregation could see the diagrams.

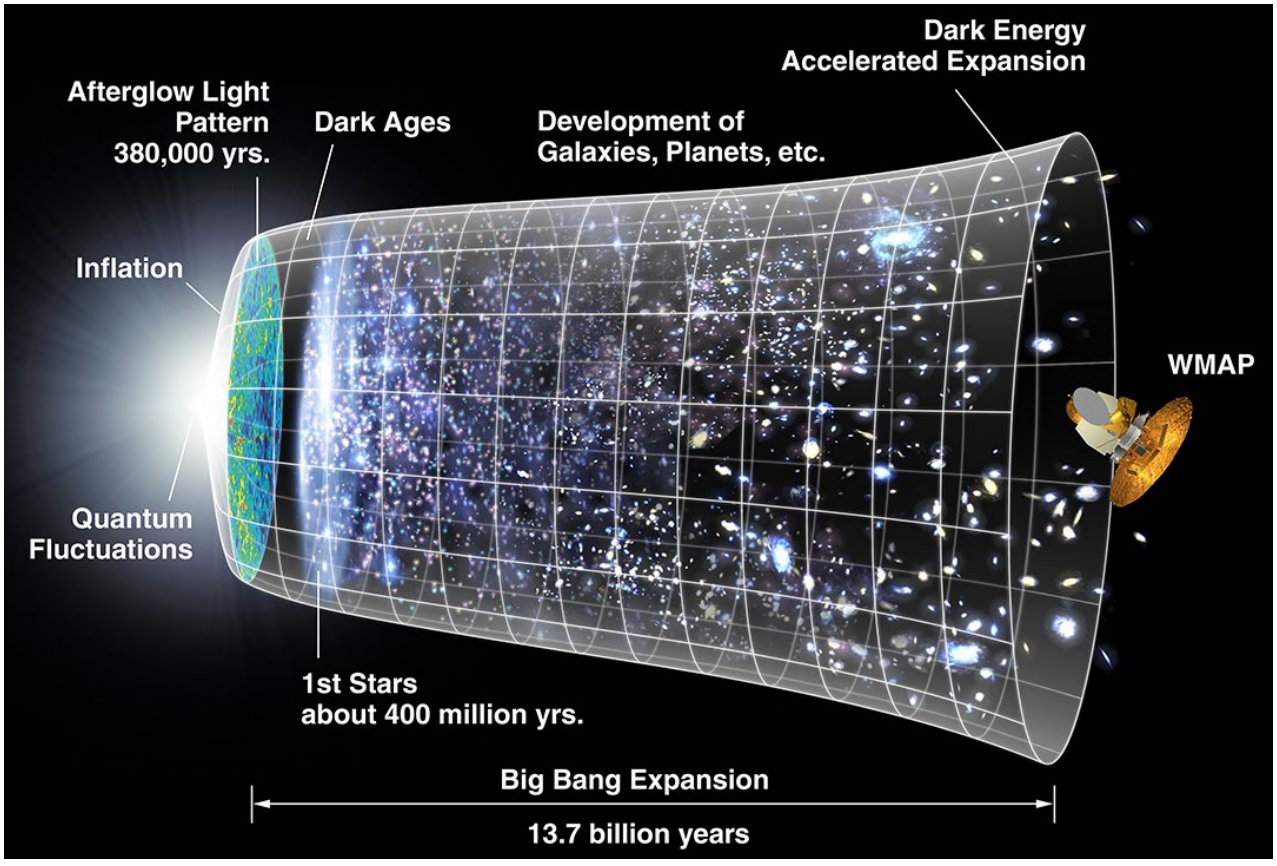
Using the same three regions - an accessible region, a restricted region, and a mysterious region – Rabbeinu Bahya suggests other models.

- He describes all life with these three regions, corresponding to plant life, animal life, and creatures that can speak.
- He describes the human body – the region from the navel downward where life originates corresponding to the terrestrial world, the region of the heart corresponding to the celestial world and the circulatory system representing the motion of the planets, and the region of the brain representing the mystery of *sekhel*, intelligence.

Now these models may not appear very scientific, but they do help us understand the structure of the world around us. They help us conceptualize the relationships between elements of the cosmos and of life.

But what is a scientific model? A scientific model is a conceptual representation of some feature of the world. A model can be physical (think of the models of molecules we built in chemistry class made of balls representing atoms and sticks representing the bonds between the atoms), it can be mathematical such as Newton's theory of gravity, or it can exist purely in one's imagination (think of Schrödinger's cat). The model is not the feature itself and is often grossly incorrect in many ways. But that doesn't diminish its usefulness. Its purpose is to make a scientific activity easier to understand.

Let's examine another model of the universe, called the "standard model of big bang cosmology".

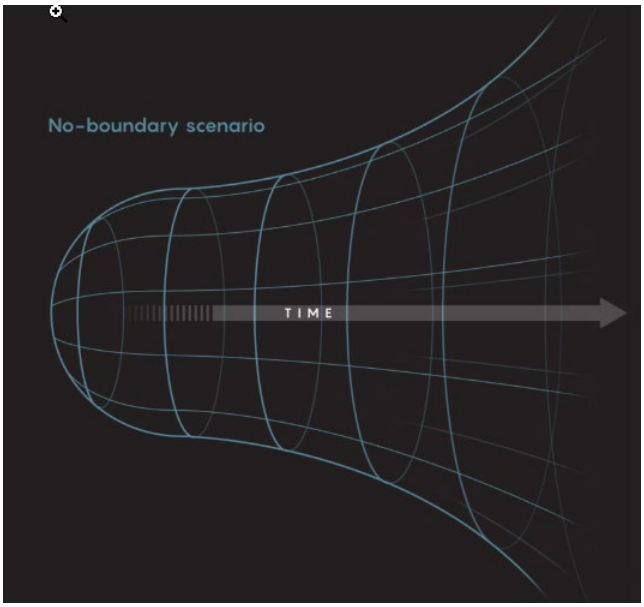


In this model, time runs along the horizontal axis, and the expansion of the universe is represented in pseudo-two dimensions with the concept of an expanding cone, each slice of the cone (vertically in the image) being a moment in time. Now there are many things about this model that are very incorrect, the most noticeable is that it is trying to represent a universe that exists in at least four dimensions (and possibly many, many more) by a projection onto a two dimensional piece of paper! But that oversimplification does not diminish the model's usefulness in helping us understand how the universe developed through time.

Something I find so fascinating about this model, is that it has the same three parts described by Rabbeinu Bahya.

We exist on the far right edge of the diagram (the outer courtyard). The satellite pictured there is the Wilkinson Microwave Anisotropy Probe (WMAP), launched in 2001 to make fundamental measurements of the universe. In our everyday lives, we don't experience the processes by which the universe operates, but we can peer into the inner courtyard. Using instruments such as WMAP, we can discover the wonders of the universe – the extraordinary properties of which defy our everyday experience. And then there is a region of mystery, beyond the boundary. Known as the "light cone of the past"[5], there is a curtain, a boundary, beyond which we cannot and fundamentally can never see.

Another model of the universe was proposed by Stephen Hawking. Called the "shuttlecock" model (named after the ball used to play badminton), he proposed that the universe did not have a beginning in time at all. That in the equations of space-time, time simply vanishes from the boundaries, leaving us with a "rounded-off cap of pure space". [6]



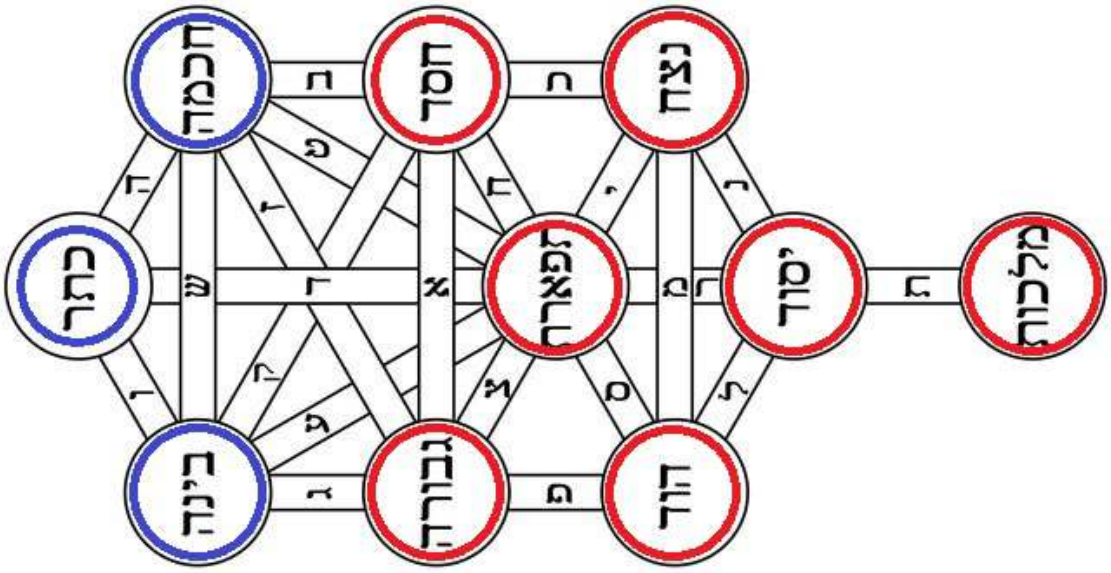
[5] Stenflo JO. Cosmological Constant from Boundary Condition and Its Implications beyond the Standard Model. *Universe*. 2023; 9(2):103. https://doi.org/10.3390/universe9020103

[6] https://www.quantamagazine.org/physicists-debate-hawkings-idea-that-the-universe-had-no-beginning-20190606/

This model has the same three regions, except the region of mystery is boundary beyond which there is no space or time. Time itself that vanishes as one looks far back into the universe. And what is left is a boundary of pure space, which would take infinite energy to reach, and is thus inaccessible.

But where is God in these models? We can't point to a location in any of these models and say God lives there. Rather, the Torah is telling us that just as God dwelt in the *Mishkan*, God dwells in the models themselves. That the act of creating a model, the act of creating a representation of the world around us in a manner that helps us understand it and teach it to others, is a fulfillment of the command to create a *Mikdash*.

Jewish spirituality provides another model of the universe when it describes the *Sefirot*. Typically, the *Sefirot* are pictured with *Malkhut* (the region where we live our lives) at the bottom, and *Keter* (the completely unknowable region of God) at the top. But let's consider turning this diagram on its side.



Turned on its side, this diagram of the *Sefirot* looks remarkably similar to the modern cosmological models we just looked at, and also exhibits the same three regions that Rabbeinu Bahya describes. On the far right is *Malkhut (God's kingdom)*. This region is where we dwell. Just like the alter in the outer courtyard of the Tabernacle, *Malkhut* is where we experience life and death.

And we can look up into the heavens and try to understand and engage with the Sefirot in the inner courtyard. And the further we go toward the left side of the diagram, the more difficult that becomes. Finally, on the far left, is *Hokhmah* and *Binah*, God's Wisdom and Understanding. These are like the boundary in Steven hawking's model. Even with an infinite amount of energy, we can never fully reach these. And *Keter*, God's Crown is shrouded in complete mystery – the singularity we call The Big Bang.

Carl Sagan wrote "Science is not only compatible with spirituality; it is a profound source of spirituality. When we recognize our place in an immensity of light-years and in the passage of ages,

when we grasp the intricacy, beauty, and subtlety of life, then that soaring feeling, that sense of elation and humility combined, is surely spiritual."[7]

That soaring feeling that Sagan describes is how I feel when I learn a new scientific concept. For me, I am drawn closer to God by learning about the majesty of God's creation. The incredible elation I feel when I understand a new scientific concept is identical to the feeling I have when I have a new insight into Torah. And when I think of Torah in the broadest sense of the word, encompassing all knowledge of everything that ever was, is, or will be, I come to the conclusion that the two are indistinguishable.

Just as studying Torah is a spiritual practice of understanding God's creation, engaging in scientific study and research is a spiritual practice of understand God's Torah. And we achieve this by creating models, which help us understand the world around us. God dwells within the models. And as we learn about the world through models, as we incorporate the models into our own consciousness, we fulfill the promise of *v'shakhanti b'tokham* – God's promise to dwell among us. The model we create becomes part of us. We have internalized it. It is within us. And through the model, God is able to dwell within us as well.

[7] Carl Sagan, The Demon-Haunted World: Science as a Candle in the Dark. Ballantine Books. 1996