Age of the Universe

Judaic Perspectives
And their associated issues
The sensitivity of the Age of the Universe discussion in Judaism today.

The areas of discussion among Judaic thinkers today touch upon the following concepts.

It is understood that the function of science is to gather data, measure it, find patterns and predict natural phenomena. It is not the function of science to make theological statements.

After gathering and measuring available natural data, the scientific community is confident that the time lapse from the formation of the universe from the Big Bang until today is approximately 13.5 billion years.

In classic Judaic writings dating from modern days back to Talmudic times, there is ample discussion among Judaic scholars concerning the tolerable theological limits relating to the length of time that Creation took and the length of time that has elapsed since Creation.

Some Judaic scholars take a more literal approach of the Creation account in the book of Genesis. Their position is that Creation took six, twenty-four hour periods. The time lapse from Creation until now is approximately six thousand years. Other Judaic scholars have a less literal and a broader interpretation of the Creation account. These scholars are more accepting of the scientific community’s position.

Many of today’s Judaic communities are deeply involved in scientific academics. As a result, traditional Jews are interested in knowing how to best align their theological beliefs with the great volume of reasonable evidence that has been uncovered over the last two to three hundred years.

This discussion explores the major Judaic approaches that have been generated in the “Age of the Universe” discussion. The purpose of this discussion is to briefly state each approach and discuss the issues that are consequential to each approach.

Neither Walder Science, nor Jerusalem Science Contest is advocating or endorsing any one of these approaches. We endorse being knowledgeable and conversant in these approaches and understanding the ramifications of each approach.
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**תשניר, ה'תשפ''א - 5781**

**שנים 2020 - 2021**

*מתאם לannée הנקרא ע' בתמוז 5781*
What is the Age of the Universe?

Question:
How old is the universe?

Answer:
We do not know the exact age of the universe, but we believe that it is around 13 billion years - give or take a few billion. Astronomers estimate the age of the universe in two ways: (a) by looking for the oldest stars; and (b) by measuring the rate of expansion of the universe and extrapolating back to the Big Bang.
Looking Back in Time

When we use powerful telescopes to look at distant objects in space, we are actually looking back in time. How can this be?

Light travels at a speed of 186,000 miles (or 300,000 km) per second. This seems really fast, but objects in space are so far away that it takes a lot of time for their light to reach us. The farther an object is, the farther in the past we see it.

Our Sun is the closest star to us. It is about 93 million miles away. So, the Sun’s light takes about 8.3 minutes to reach us. This means that we always see the Sun as it was about 8.3 minutes ago.

The next closest star to us is about 4.3 light-years away. So, when we see this star today, we’re actually seeing it as it was 4.3 years ago. All of the other stars we can see with our eyes are farther, some even thousands of light-years away.

Stars are found in large groups called galaxies. A galaxy can have millions or billions of stars. The nearest large galaxy to us, Andromeda, is 2.5 million light-years away. So, we see Andromeda as it was 2.5 million years in the past. The universe is filled with billions of galaxies, all farther away than this. Some of these galaxies are much farther away.


In 2016, NASA’s Hubble Space Telescope looked at the farthest galaxy ever seen, called GN-z11. It is 13.4 billion light-years away, so today we can see it as it was 13.4 billion years ago. That is only 400 million years after the Big Bang. It is one of the first galaxies ever formed in the universe.

Learning about the very first galaxies that formed after the Big Bang, like this one, helps us understand what the early universe was like.

This picture shows hundreds of very old and distant galaxies. The closest one found to GN-z11 is shown in the circle at left. The image is 10 light-years across, so the galaxy is so far away. Credit: NASA/ESA, R. Gennaro (Yale University), D. Dunlop (Victoria University of Wellington), and S. Mingelhout (University of California, Santa Cruz).

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Measurements made by NASA's WMAP spacecraft have shown that the universe is 13.7 billion years old, plus or minus about 130,000 years. They were able to do this by making detailed observations of the fluctuations in the cosmic microwave background and using that information in Einstein's Theory of General Relativity to 'run the clock backwards to time equal zero'.
Question:
How do we know that the universe must be greater than 5781 years old?

Answer:
Because we can see cosmic objects that are farther than 5,781 light years away. If the universe was exactly 5,781 years old, we could not see those objects.
**Nature was very different at Creation**

**Definition:**
God created the world 5,781 years ago. However,

1. The universe environment at that time was so chaotic and qualitatively different from today, that the everything looks much older. Rabbi M.M. Schneersohn, the Lubavitcher rebbe. Rabbi S.R. Hirsch.

2. Chaotic global events like the flood of Noach formed fossils. Rabbi Naftali Tzvi Berin, the Netziv. Rabbi Y.M. Weiser, the Malbim.

3. Adam’s sin caused a chaotic corruption of nature. Rabbi Chaim Halberstam.

4. What looks like 13.5 billion years happened in 7 – 24 hour periods. R. Shimon Schwab. Dr. Gerald Schroeder

**Issues and problems with this approach.**

1. Independent measurements calculate a billions years age.
2. Massive evidence demonstrates that the current laws of nature have been in place since Creation.
3. Change in constants would either make the universe non-existent or result in a change of a few billion years; not 13.5 billion.
4. The universe, explored, is not chaotic and does not indicate that it was chaotic at any time.
5. What difference does it make to anybody but God if the world took 6 days but looks like 13.5 billion years? Does the time difference have any significance in God’s eyes?
What we see now is how it was made

Definition:
The universe, as we see it, was created as such, by God. God planted evidence of an old universe to test our faith in the literal words of Genesis.

Supporters of this approach:
Rabbi M.M. Schneersohn, the Lubavitcher rebbe.

Citation: Talmud Rosh Hashanna 11A (see to right)

Issues and problems with this approach
1. Ample evidence from scripture that God does not use this approach to test our faith. Yeshayahu-Isaiah, 40:26, Psalms 19:2.
2. Classical writers say that nature as we understand it do not contradict the Torah. Kuzari 1:67
3. Every maturely grown item must have a history. If it does not, then it cannot be argued that it was created complete.
4. There is no evidence in scripture that God created the “fake news” in the form of an old looking universe.
5. The above cited Talmudic passage can only mean that God made everything with full potential for development. Otherwise, other sections in the same Talmudic passage would contradict this selection.
6. It can become far fetched.
7. It requires an extraordinary level of faith and could lead to the question of: “Can we trust God?”
Ours is a new world in a series of worlds

**Definition:**
God created worlds and destroyed them. Our universe is a successor universe and what appears ‘old’ are remnants from previously created worlds.

Supporters of this approach:
1. Sefer Hatemunah (Kabbalistic)
2. Rabbi Yitzchak of Akko (13th – 14th cent.)
3. Rabbi Yisrael Lipshutz (Tiferet Yisrael) (19th cent.)
4. Rabbi S.R. Hirsch (19th cent.)
5. R. Yehudah Rosenberg (19th cent.)

**Issues and problems with this approach**

Which Genesis is the Torah describing? The very first one or the Genesis that introduces our current universe?

1. If Genesis is describing the very first creation, why doesn’t the Torah tell us of all the subsequent creations.
2. If Genesis is describing the creation of the current universe, why did God have to create it from scratch with stars and planets? Especially if we are finding all the leftovers from the previous worlds or cycles?
The Day to Era “Reconcilers”

Definition:
The “Days” of Creation per Genesis are deemed to be eras of universe formation, such that,
1. Each day takes make years.
2. Because each day represented a distinct section of universe or world formation, the chronological lengths of the “days” may differ from one another.
3. The universe formation as seen in the natural evidence is reconciled to the Genesis text.

Supporters of this approach:
Dr. Natan Aviezer
Dr. Gerald Schroeder
Prof. Cyril Domb

Citation:
“‘And there was evening and there was morning, one day’ This is a thousand years, which is the day of God, as it says: ‘For a thousand years are in Your eyes as a day’ (Tehillim – Psalms 90:4)” Midrash Pesikta Rabbati, Hosafa 2:1

Issues and problems with this approach
1. Does it undermine Shabbat? Aryeh Kaplan writes that the week’s six days and the Shabbat are symbolic of God’s real Creation.
2. The order of science does not agree with the order of Genesis. The reconcilers are hard pressed to explain away the differences.
3. Genesis is rendered incomprehensible to ancient Israelites.
4. What exactly is the Rakia - Shamayim – the firmament?
   a) The atmosphere?
   b) The Solar system?
   c) The Milky Way Galaxy
   d) The Universe?
Theology and Science – Never the Twain shall meet.

1. This approach avoids all conflicts between scientific data and Judaic belief.
2. It supports a non-literal rendering of Genesis chronology.

The answer to this problem leads us to what I regard as the crux of Rav Kook’s “chiddush,” which has no source in any other approach – the distinction between the “peshat,” the literal level of the text, and the more profound levels of religious meaning. On the literal level, the separatist view is appropriate. The story of Creation, as it appears in the text, has no intention of conveying a scientific truth. Its only purpose is to serve as a platform for instruction, to set the moral and religious basis for man’s existence in the world, by both highlighting man’s important status in Creation and teaching the imperative of obeying God’s command. On the deeper, more inward levels, in contrast, the textual descriptions contain profound message as to how the world came into being and of the meaning of human existence and of history. On these levels, it may be that the exegetical approach is more effective, since it allows us to expose new levels, previously unknown to us, concerning God’s revelation and manifestation in the world.

Here, Rav Kook adds a principle which is of immense importance in dealing with this problem. He argues that God’s revelation is not completely open (as one might have thought) in conveying information about the world to us. God limits His revelation; the Torah and prophecy, which mediate God’s revelation, convey the truth only in a manner that the people of each age are able to absorb and use as a strong basis for their moral and religious world.

But revelation, in the direct sense, is not the only source of knowledge about reality, and a scientific consciousness is also a foundation for a moral and religious world-view. As an example, Rav Kook cites the fundamental astronomical question concerning the central point of the movement of the stars. As we know, in the ancient world it was believed that Earth was at the center of the universe and the sun and stars moved around it. More advanced scientific study, starting with Copernicus, showed that in fact this was not the case. This was not a purely scientific issue, as stated, our knowledge also creates a moral consciousness. Judaism, explains Rav Kook, has always sought to promote the message of man’s greatness, his importance, and his responsibility for the world. Had mankind started out on this moral struggle with the picture of the world which we have today – a tiny planet located somewhere in a sea of immense galaxies – then our world, and man within it, would have been perceived as insignificant.