

Parallel Thinking Part 9: The Age of the Universe I

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One of my earliest childhood memories is standing on the side of a busy road with my grandmother, watching a police car zoom past with its lights on and sirens blaring out. I remember wondering why the tone of the siren

appeared to change from a high pitch as the car approached, to a much lower pitch after it passed. This is known in physics as the Doppler Effect, named after the Austrian physicist who explained the phenomena.

Sound travels as a wave through a medium such as air, like ripples in a pond. The frequency of these waves determines how high or low the pitch will be; waves closely bunched together produce a high pitch whereas stretched waves produce a lower pitch. If the source of the sound is moving, like the police car, the waves bunch up in front of the car and are stretched behind the car. This explains the change in pitch that I noticed.

The same can happen with light waves, if the object emitting the light is moving quickly enough. The American astronomer Edwin Hubble observed this effect when he analysed light spectra from distant stars and galaxies. The spectra shifted to the red, lower frequency end of the spectrum, indicating that Universe was not static but expanding. This in turn implied that the Universe must have had a beginning.

By measuring the distance of these stars and galaxies, coupled with the magnitude of the spectra's shift to red, Hubble was able to calculate the age of the Universe, a figure which has now been refined to approximately 15.8 billion years.

The Jewish calendar identifies the date of the creating of Adam on the sixth day of Creation as 5777 years ago. The Creation story in Bereishit occurred over the six previous days. How can we reconcile the two positions?

There are three main approaches to this conflict. One could (a) accept the Torah as literally true and disagree with the scientific evidence, (b) accept that the Torah is literally true and that scientific evidence is also accurate and attempt to reconcile the two or (c) view the Torah as authentic, but reconcile its messages with science by understanding the text of the Torah in a non-literal way.

The first approach either casts doubts over the scientific method, asserts that the laws of nature have changed - yielding false results - or concludes that God created a fully formed Universe 5777 years ago with a past 'history' stretching back 15.8 billion years. The second approach views each of the six 'days' of Creation as epochs of time lasting for billions of years. The third approach recognises the authenticity of both science and Torah and sees the Torah as primarily concerned with spiritual concepts rather than as a textbook of ancient scientific philosophies.

The next three articles will explore these positions.

