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From the Depths of Space

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An extraordinary object, which may be the most distant yet detected in the universe, was discovered by astronomers on April 23, 2009. By April 28, many news reports had touted the discovery from a big-bang perspective.[1]

This new object is known as a gamma ray burster (GRB), designated as GRB 090423. It was detected by the Swift Gamma Ray Burst Explorer satellite and then verified by two other earth observatories (one of which was Hawaii's Gemini Observatory). Gamma rays (which are waves) are part of the electromagnetic spectrum and are higher in frequency and energy than X-rays. Gamma waves are often associated with various nuclear processes.

GRBs have been observed to have higher redshifts than any other objects. For years the objects with the highest known redshifts were quasars. There has been long debate among astronomers as to what quasars really are, and now there is a new debate over what gamma ray bursters are. In this particular instance, GRB 090423 gave off a 10 second burst of gamma rays and X-rays followed for a short time by a lingering infrared glow.[2,3]

A Powerful Mystery

To appreciate the mystery behind gamma ray bursters, it is necessary to be aware of redshifts and Hubble's Law. Hubble's Law is an important mathematical relationship between redshift and distance. Namely, the farther away a galaxy is from our location, the more its light has been shifted to the red end of the spectrum.

Astronomers understand Hubble's Law as being a result of the expansion of the universe. As the light waves travel, the space in which they are traveling is being stretched out; so, the wavelength of the light is increased. The longer the light has been traveling, the more its wavelength is increased. This is why more distant galaxies are much more redshifted than nearby ones. But there are other things that can cause light to be shifted to longer wavelengths ("redshifted"). One of these is the Doppler Effect.

The Doppler Effect is something that happens to waves when the source of the waves is moving (such as when a star moves away from Earth). Note that Hubble's Law is not due to the Doppler Effect but there is a Doppler Effect on the light from stars and galaxies. For the very largest distance scales, the Doppler Effect would be much smaller than the redshift effect from the expansion of space. We can hear the Doppler effect for sound waves if a train whistle or a car horn is on while it moves away from us. The waves leaving the moving vehicle get spread out, and, thus, the pitch of the sound goes down as the vehicle moves away from the person listening.

Light is affected the same way if a star is moving away from earth. Thus, a star moving away from earth causes the frequency or color of the light to shift toward the red—or down in frequency. If a star is moving toward earth, its frequency is shifted higher, toward the blue end of the spectrum. Within our own galaxy, about half of the stars are shifted toward the blue, and half are shifted toward the red. We know the light is shifted because we can compare the light spectrum from objects in space to the light emitted by known substances in a laboratory.

Almost all galaxies are shifted toward the red. Furthermore, the larger the redshift, the greater the object's distance from us. This is exactly what we would expect if the entire universe is expanding, and the light is redshifted as a result of that expansion. Astronomers use the Hubble Law and various other distance measuring methods to estimate the distance to various objects in space. Some quasars have redshifts of 7, which is greater than the redshifts of most stars and galaxies. By Hubble's Law this would make these quasars extremely distant, perhaps billions of light-years from earth (a light-year is about 6 trillion miles). GRB 090423 has a redshift of about 8.2, even more than quasars. Thus it may be the most distant object measured to date.

If an object with such a large redshift is following Hubble's Law, its distance from earth would be approximately 13 billion light-years. Astronomers estimated that the burst of GRB 090423 occurred only approximately 630

million years after the big bang.[4] For it to generate enough radiation for us to detect it at such a distance, it must create the most powerful kind of explosion astronomers know of. It is a mystery what could generate so much energy and fit the observations.

Secular scientists have tentative theories regarding GRBs that involve both a collapsing star and a supernova. The current thinking of some astronomers is that an extremely massive star neared the point where it had used up all its nuclear fuel, and a portion of the star began to collapse into a black hole or a neutron star. As this happened, the outer layers of the star were blown away in a supernova explosion. Thus, the collapse and the supernova coincided, and gamma waves are emitted in two powerful beams at the north and south poles of the object.

A Problem with Time

Objects discovered at such vast distances present a timing problem for big bang theorists. In big bang theory, for a large star to become a black hole or a GRB, it would probably need to be a second (or third) generation star, and it would have limited time to form and use up all its fuel. In the period of 630 hundred million years after the big bang, the first stars would have to "die," then second generation stars would form from the material left over from the first stars. The second generation stars operated for their entire "lifetime." Then, one of these second generation stars would have become the GRB at the end of its "life." It is debatable whether there would be enough time for all this to happen for the GRB to occur so that we would see it.

Astronomers have long believed that early in the history of the universe, just a few hundred million years after the big bang, there would be stars that were different from most stars in the universe today. Astronomers have searched for evidence of these so-called "first generation" or "Population III" stars for years. There is no observational evidence of their existence, but they still play an important role in big bang theory. Such stars would be of different composition, for example, in having no heavy elements and consisting of only hydrogen, helium, and minor amounts of lithium.

No one has detected stars without heavy elements above helium. In, fact astronomers have observed evidence of elements like carbon and iron in objects that are claimed to be from the early eras of the Big Bang.[5–7] Indeed, there is evidence that some GRBs contain metals such as iron and magnesium.[8] Heavier elements like carbon or iron, according to big bang ideas, could not be produced in the big bang itself but instead must have been produced in supernova explosions that took place when large stars died. Astronomers who operate by naturalistic assumptions and do not allow for supernatural creation as Genesis describes must resort to complicated scenarios like these to explain the origin of the chemical elements.

A Simple Answer

How is this all to be understood from a creation viewpoint? In a biblical viewpoint, objects created during the Creation Week could be fully formed and would abruptly appear with all the necessary elements present from the beginning. There would be no need to postulate a special early generation of stars and galaxies that we find no evidence for. Thus, in a creation view there is no difficulty of not having time for objects to form by natural processes in the beginning.

Creationist physicists and astronomers continue to research many questions about the universe, including the meaning of large redshifts. It may be that when we look at objects with large redshifts, we are looking back into the Creation Week, possibly to the fourth day. The fourth day is when Genesis 1 indicates God created the stars. The young-age creation cosmologies of physicists John Hartnett and Russ Humphreys both imply the large redshifts are due to God's stretching out space during the Creation Week.[9, 10]

Creation scientists who hold to a young universe and six literal creation days do not reject everything that secular astronomers believe. However, assumptions need to be questioned thoroughly. The big bang does not agree with the creation account in Genesis.[11] Creation scientists do not usually have issues with the experimental side of doing astronomy, though it can be very difficult to determine what some observations mean.

Creationist physicists generally accept the reality of black holes and accept the validity of redshift measurements. These things are all consistent with observational science. But, instead of the mysterious big bang process expanding the universe, creationists believe God "stretched out the heavens" (see Jeremiah 10:12) in the beginning as Scripture says. Scientists are still discovering parts of God's creation that have never been seen before.

Footnotes

1. Retrieved from, http://www.theprovince.com/Life/Telescope+snaps+universe+most+distant+object/1541911/story.html
2. The few galaxies that are blueshifted are all very nearby. Their velocity toward earth produces a Doppler shift toward the blue, which overcomes any redshift due to expansion of the universe, since the latter effect is small over cosmically short distances.

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