Cosmological interpretation may be wrong for record redshift galaxy!

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Record redshift

With much fanfare, the European Southern Observatory (ESO) press release of 1 March 2004 stated: 'VLT Smashes the Record of the Farthest Known Galaxy. Redshift 10 Galaxy discovered at the Edge of the Dark Ages'.[1,2] The release goes on to say:

> 'Using the ISAAC near-infrared instrument on ESO's Very Large Telescope, and the magnification effect of a gravitational lens, a team of French and Swiss astronomers … has found several faint galaxies believed to be the most remote known. Further spectroscopic studies of one of these candidates has provided a strong case for what is now the new record holder—and by far—of the most distant galaxy known in the Universe. Named Abell 1835 IR1916, the newly discovered galaxy has a redshift of 10 … and is located about 13,230 million light-years away. It is therefore seen at a time when the Universe was merely 470 million years young, that is, barely three percent of its current age. This primeval galaxy appears to be ten thousand times less massive than our Galaxy, the Milky Way. It might well be among the first class of objects which put an end to the Dark Ages of the Universe.'

But are these claims valid? Closer examination of the published paper[3] by the team of astronomers led by Roser Pelló from the Observatoire Midi-Pyrénées (France) and Daniel Schaerer from the Geneva Observatory and University (Switzerland) reveals another possibility.

The proposed galaxy, now called IR1619, found in Abell cluster #1835,[4] is claimed to be visible only because the intervening Abell cluster of galaxies, which acts as a gravitational lens, magnifies IR1619 around 25 times.[5] The researchers state that it is only visible in near-infrared light, because the enormous redshift has shifted light from UV to IR. So their conclusion is based on their assumptions about the source of the light and the interpretation of its observed redshift from a single Lyman-α emission line. They say:

> 'The observed line is hardly resolved … Although other line identifications corresponding to lower redshifts cannot be ruled out in principle, they appear very unlikely for various reasons.'

They then go on to state their reasons, which include the limited probability that the redshift is less than seven, the agreement with photometric redshifts (which some astronomers doubt), and the position of the object on a critical line of the gravitational lens formed by the Abell cluster.

Gravitational lensing

For argument's sake, let us accept that Pelló *et al.* have correctly measured this redshift for the object from the single emission line. However, let us look at their reasoning regarding the Abell cluster, which indicates that they implicitly accept that the cluster acts as a gravitational lens. Halton Arp has published a great deal of information on the false identification of gravitational lenses.[6–10] He believes that they are more often the products of ejections of new material from the hearts of AGNs (active galactic nuclei). The authors of the recent discovery state:

> 'Clearly, without strong gravitational lensing and excellent seeing conditions, near-IR photometry and spectroscopy of such a faint source would be impossible with current 8–10 m class telescopes.'

The validity of the claim that they are seeing back to a period just after the 'Dark Ages' thus depends on their assumption that the source is being gravitationally lensed.

If the gravitational lensing hypothesis is correct, in this case, one would expect to see an Einstein cross, consisting of four arcs or elongated images of the same object on opposite sides of the lensing galaxy. To date, no arcs, nor the other expected mirror images of the source, have been observed for Abell cluster #1835, even though lensing has been claimed. Pelló *et al.* have suggested a test of their gravitational lensing interpretation, which requires obtaining multiple near-infrared images with the high-resolution Hubble Space Telescope.[11]

Contrary to the prevailing gravitational lensing paradigm, Arp reports much evidence for misplaced interpretations of gravitation lensing, even from distinct galaxies.[12] For example, the famous Einstein cross G2237+0305 (see Fig. 1) shows evidence of low-density gas between the images but at the same redshift of the quasars. Arp argues that the gravitational lensing assumption gives the quasar a brightness two magnitudes more than the brightest object in the universe (which is an unlensed quasar). Arp encountered strong editorial bias from the astronomical community when he tried to publish his evidence countering the gravitational lensing interpretation of this Einstein cross and eventually published his counter-argument in a physics journal.[13]

Arp's alternative interpretation of the so-called gravitational-lensed objects is based on an ejection mechanism from active galaxies. Arp believes the distinction between quasars and active galaxies is not significant; rather, they can be understood as different stages of development of the same phenomena. He argues that Abell clusters often show ejection phenomena, such as paired objects, sometimes as arcs, exiting from an AGN, and most of the arcs in the Abell clusters 2218, 2281, 370, etc. can be explained by this mechanism. He interprets them as luminous filaments of material resulting from the ejection phenomena, involving both radial and circular arcs.[14] Arp concludes that such arcing is often falsely identified as gravitational lensing by the majority of the astronomical community.

Intrinsic redshift

A number of reputable astronomers and astrophysicists agree with Arp.[15] They believe that if quasars are associated with a central parent galaxy (this is often the case when quasars appear in pairs on either side of a parent galaxy, as if the parent galaxy has flung them out in opposite directions), the large measured redshifts are mostly intrinsic, and not caused by cosmological expansion.[16]

Instead, they relate the quasar redshifts by:

$$(1 + z_{obs}) = (1 + z_G)(1 + z_i)(1 + z_D),$$

where z_{obs} is the observed redshift and z_G is the redshift of the parent galaxy from which a strong case has been made that the quasar originated (therefore, at a minimum, it represents the cosmological component of the quasar red-shift). The parameter z_i is the quasar intrinsic redshift which is the result of as-yet-unknown physics arising in the quasar.[17] A thorough analysis of intrinsic redshifts may be found in refs. 8 and 10. Lastly, z_D is the Doppler redshift, which results from the motion of ejection from the parent galaxy, and is usually found with '+' and '–' signs in quasar pairs. The magnitude of the Doppler redshift is usually $|z_D| \leq 0.1c$, or 10% of the speed of light. The galaxy redshift may also have an additional intrinsic component, possibly due to a previous galactic ejection, but this will not be considered here.

In 1971, Karlsson[18] showed that the intrinsic redshifts tend to have values that can be fitted to a discrete sequence, such that

$$(1 + z_{n+1})/(1 + z_n) = 1.227,$$

where n is a positive integer index and $z_1 = 0.06$. This generates successive values at z = 0.30, 0.60, 0.96, 1.41, 1.96, 2.63, 3.44, 4.47, 5.73, 7.26, etc.

In the following analysis, I have chosen $z_i = 7.26$, because it is the only value that gives $|z_D| < 0.1$. Using the published value of the redshift for the Abell cluster of $z_G = 0.253$ and the measured redshift $z_{obs} = 10$, from equation (1) we get $z_D = 0.063$, which is quite a reasonable value for velocity redshift.

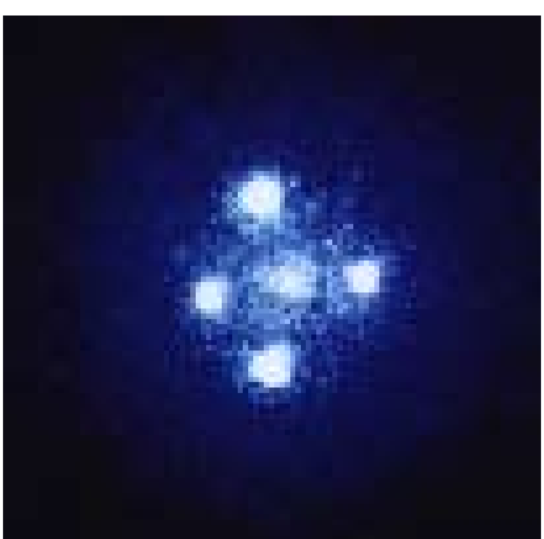

Photo by NASA and ESA

Figure 1. *Gravitational lensing (G2237 + 0305)*

So, assuming that this is the correct interpretation, the redshift distance of the galaxy, alleged to be z =10, is only at most z = 0.253, but with an intrinsic redshift of z = 7.26. This would give it one of the largest recorded intrinsic components, at a much lower visual brightness, four orders of magnitude higher,[19] given its proximity.[20] This means it must be 100 million times less massive than our galaxy.

Low mass and high intrinsic redshift is a prediction of the ejection model, in which newly ejected objects start with zero initial inertial mass. The Hoyle-Narlikar-Arp-Das *variable mass hypothesis* proposes that the intrinsic redshift decreases in time as the objects evolve from high to low intrinsic redshift, while they change from quasars to normal galaxies.[17] This would make it one of the youngest created objects.

I asked Halton Arp what he thought of this and in an email he replied, 'Very interesting. I have been meaning to do that calculation. The trouble is one needs a number of examples. We should start keeping count.' Many more of these types of calculations should be carried out for galaxies—and other objects—with high redshifts.[21] Such calculations may turn up many more surprises.

Conclusion

The above analysis demonstrates that a change in assumptions can radically alter the conclusion. Because astronomers assume that the big bang is the correct cosmological model, they automatically expect all galaxies to be distributed according to that model. Critical thinking is thus not applied to the data, which may be interpreted differently. One may argue that the example cited here, by itself, doesn't build a strong case, but it still suggests that we need to look more carefully at the data and see what alternative plausible interpretations fit. A correct interpretation of this evidence would also rely on the Words of Him Who created it all. The ejection process described by Arp and others fits with a creationist cosmology[17,22] but not with the big bang.

References

1. <www.eso.org/outreach/press-rel/pr-2004/pr-04-04_pf.html>, 1 March 2004.
2. The Dark Ages are the initial period shortly after the supposed big bang, when hydrogen in the first stars had not condensed sufficiently to ignite and produce light.

3. Pelló, R., Schaerer, D., Richard, J., Le Borgne, J.-F. and Kneib, J.-P., ISAAC/VLT observations of a lensed galaxy at z = 10.0, *Astron. Astrophys.* **416**:L35–L40, 2004. (Also at <arxiv.org/PS_cache/astro-ph/pdf/0403/0403025.pdf >, 1 Mar 2004.)
4. Galaxies recorded in the *Abell Catalog of Rich Clusters of Galaxies* are clusters which have a high concentration of relatively bright galaxies.
5. However, another paper suggests that the magnification might be only a factor of 5. See Ricotti, M. *et al.*, Have we detected one of the sources responsible for an early reionisation of the Universe? <arxiv.org/PS_cache/astro-ph/pdf/0403/0403327.pdf> v**1**, 15 Mar 2004. This would alter interpretations of the brightness of IR1619.
6. Arp, H., *Quasars, Redshifts and Controversies,* Interstellar Media, Cambridge University Press, Berkeley, CA 1987.
7. Arp, H.C. and Crane, P., Testing the gravitational lens hypothesis in G2237+0305, *Phys. Lett. A* **168**:6–12, 1992.
8. Arp, H., *Seeing Red, Redshifts, Cosmology and Academic Science,* Apeiron, Montreal, 1998.
9. Arp, H., The distribution of high-redshift (z>2) quasars near active galaxies. *Astrophys. Journal* **525**:594–602, 1999.
10. Arp, H., *Catalogue of Discordant Redshift Associations,* Aperion, Montreal, 2003.
11. Pelló, *et al*., ref. 3, section 4, p. 6.
12. Arp, ref. 8, pp. 173–187.
13. Arp, H. and Crane, P., Testing the gravitational lens hypothesis in G2237+0305, *Phys. Lett. A* **168**(1):6–12, 1992.
14. Arp, ref. 8, p. 184, figs. 7–15 and plates 7–15.
15. Including Hoyle (now deceased), Narlikar, Chu, Burbidge and Burbidge.
16. See Repp, A.S., The nature of redshifts and an argument by Gentry, *CRSQ* **39**:269–274, December 2002.
17. Hartnett, J.G., Quantized quasar redshifts in a creationist cosmology, *TJ* **18**(2):105–113, 2004.
18. Karlsson, K.G., Possible discretization of quasar redshifts, *Astron. Astrophys.* **33**:333–335, 1971.
19. Luminosity is described on a logarithmic scale with more positive values indicating less luminous.
20. Proximity is calculated from the reassessed redshift based on the Hubble equation.
21. In this case it was a point source, so describing it as a galaxy may be premature.
22. Hartnett, J.G., The heavens declare a different story! *TJ* **17**(2):94–97, 2003.