

## Re: Talking about distance

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- *From:* "Old Grandpa Fritz" <j1234@xxxxxxx>
  - *Date:* Fri, 23 Jan 2009 10:08:49 -0500
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"Dennis Woos" <dpwoos@xxxxxxxx> wrote in message  
[news:btqdnDT9m4DAuerUnZ2dnUVZ\\_jGdnZ2d@xx](news:btqdnDT9m4DAuerUnZ2dnUVZ_jGdnZ2d@xx)

Over the years (and at a recent astro club meeting), I have many times heard stuff along the lines of "the light we are seeing from the Andromeda Galaxy left it 2.5 million years ago" followed by "so it might no longer exist". The same issue often comes up when I tell folks that the Sun is 8 light minutes away from the Earth, or that one's own hand held in front of own's face is one billionth of a second away.

In what sense is it true that M31 might no longer exist, or that one's hand might no longer exist, or that anything and everything might no longer exist no matter how arbitrarily close we are to it? I have never been comfortable with this "might not exist" stuff, and maybe it is because of some vague ideas of Relativity and a "light cone". Anybody have any thoughts/assistance? How should amateur astronomers be talking about distance?

Old Grandpa used to get the same question and here is how he explained it: If you are looking at a galaxy, you can technically say "it's no longer there" because in the millions of years it takes the light to reach us, the galaxy has changed position so it's no longer at that *\*exact\** point. Of course, the closer the galaxy is, as in the case of M31, the lesser it has moved in general, but the original statement is valid as long as you go on to explain the aforementioned.

Now, if it's a quasar or some distant galaxy approaching say 1 billion light years, it may, in fact, be no longer there and *\*may\** not exist. There will have been a large movement through space in all of that time, so it's position in the telescope wouldn't be similar at all to the actual position. At the very least, it probably wouldn't even look the same now. It may not exist and there's no definitive data to refute that argument. Of course, there really isn't for closer galaxies either but it just seems a much stronger assumption that they are still existing.

Now if you look at objects within our own galaxy such as stars, nebulae, clusters, most are probably still existing but some of these objects— stars in particular— may no longer be there because they have moved significantly

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depending on distance from us. And, some stars may no longer exist if they went nova, so you could get away with "no longer exist" as long as stars are explained.

HTH,  
Grandpa Fritz

Dennis