

Re: Article: Most distant galaxy cluster yet is revealed

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Robert Karl Stonjek wrote:

[snip]

> *Clusters, as I*
> *understand it, rotate. For instance, I'm not aware of any 'globular*
> *cluster' of galaxies.*

Frankly, I don't know. Where did you get this about rotation from?
I always envisaged galaxy clusters more like a ball of gas – the
galaxies moving around relatively freely, sometimes bumping into
each other (or, more precisely, being deflected due to gravity).

>>>*If the cluster started forming 2.5 billion years*
>>>*after the BB and stopped 2 billion later, and is 9.5 billion distance,*
>>>*then that makes the universe 14 billion years old at least.*
>>
>>*If you say "and the light needed 9.5 billion years to get to us", then*
>>*you are right. Otherwise, no.*
>>
>
>
> *If the light takes 9 billion years to get here, and the light left a galaxy*
> *that was already 4.5 billion years old, then I count a total 13.5 billion*
> *years (just within current theory limits).*

Indeed. But that was not my point above. My point was that "is 9.5
billion light years distant" is not the same as "the light needed 9.5
billion years to get to us".

>>>*That's longer than*
>>>*the most popular estimates of recent times.*
>>
>>*14 billion years is still within the error margins of the usually*
>>*quoted 13.7 billion years.*
>>
>

>

> *OK, but this galaxy represents the very near limit.*

Yes. Hint: that's why the astronomers freely admitted that this was surprising.

> *Hypothetically, if*

> *another galaxy is found at 10.5 billion light years*

You mean, a galaxy for which the light needed to get 10.5 billion years to reach us? Again: not the same.

> *and is of the same age (maturity),*

For the second or third time: the article didn't say that the *galaxies* were mature. It said that the *cluster* was already well-developed. The point was that the gas of the cluster had already settled into a spherical shape. They said nothing about the state of development of the individual galaxies (e.g. the ages of the stars in it).

> *that would falsify current models, wouldn't it?*

As I already said: that would cause problems for our ideas of structure formation (*or* the Big Bang theory).

> *The theories supporting the BB are falsifiable,*

> *aren't they,*

Err, theories don't support anything. Theories *themselves* are supported (by evidence).

If you meant to ask "the Big Bang theory is falsifiable, isn't it", then yes, indeed it is.

> *so at what distance would a*

> *galaxy of this age have to be found to falsify current theory?*

Galaxies at *any* distance having stars in them which are already so old that their age plus the time the light needed to get to us is greater than 14 billion years would falsify the BBT. However, that has not been found so far.

> *As the BB in general is a model and not a theory per se,*

Please elaborate.

> *falsifying underlying theories*

Do you mean General Relativity? I am not aware of any other "underlying" theory (strange choice of words).

- > renders the model 'less useful' or 'more difficult' but
- > does not falsify it as such – but it is looking more and more like the model
- > you have when you just can't think up a better one.

Essentially **every** theory and model in physics is based on "we can't think of any better in the moment".

[snip]

- >>>If the galaxies formed before
- >>>the cluster then this cluster of galaxies better be the last mature
- >>>cluster
- >>>we see – but what will the big bangers be saying when we spot one at 10
- >>>billion, 12 billion etc??
- >>
- >>We will say then that there is obviously an error with our ideas
- >>of structure formation.
- >>
- >>
- >>>And we will.
- >>
- >>How do you know?
- >>
- >
- >
- > I have, perhaps unjustifiably, unwavering faith in science's ability to
- > discover the truth (eventually) by rigorous and carefully conducted research
- > and observation.

I have, too. So what? Why does this give you the certainty that science will discover what you claimed above? Do you think that you already know the truth, and science **has** to discover that therefore?

- > It is when they get around to interpreting the meaning of
- > their discoveries that they tend to switch from Einstein (mathematical
- > physics)

The Big Bang theory is not mathematical physics. If you think it is, I can recommend you some scientific journals which **actually** deal with mathematical physics.

- > or Hubble (observational physics) to chicken little (stream of
- > consciousness/big bang physics).

Whatever the last part is supposed to mean.

Bye,
Bjoern