# Re: WMAP: New Satellite Data On Universe's First Trillionth Second

***Source:*** http://sci.tech−archive.net/Archive/sci.physics/2006−03/msg02164.html


- *From*: Sam Wormley <swormley1@xxxxxxxxx>
- *Date*: Sun, 19 Mar 2006 05:54:06 GMT


rummij@xxxxxxxxxxx wrote:

> WMAP: Foundations of the Big Bang theory
> http://map.gsfc.nasa.gov/m_uni.html
>
> Layman questions:
>
> "The Big Bang Model is a broadly accepted theory for the origin and evolution of our universe. It postulates that 12 to 14 billion years ago, the portion of the universe we can see today was only a few millimeters across."

That is incorrect... the decoupling of energy and matter creating the CMB occurred at about 380,000 years after the BB. The universe had expanded enormously in the first fraction of a second and had been expanding and cooling for 380,000 years.

> Why is it only the portion "we can see"? The portion we can see is surely only a completely arbitrary subset reflecting the conditions of observation rather than what's actually out there.

We can see out for as long as light has had to travel in 13.7 billion years, therefore, or observable horizon is about 13.7 billion light years in radius.

> "[...] the cosmic microwave background radiation, the remnant heat from the Big Bang, has a temperature which is highly uniform over the entire sky. This fact strongly supports the notion that the gas which emitted this radiation long ago was very uniformly distributed."

> If it appears uniform here and 2 billion light years away, does this not suggest that it isn't homogeneous? Wouldn't you expect it to be fainter here, after 2 billion years of additional cooling?

You are assuming that there is some center... when in fact all points in the universe are equally the center.

No Center
http://www.astro.ucla.edu/~wright/nocenter.html

Also see Ned Wright's Cosmology Tutorial
http://www.astro.ucla.edu/~wright/cosmolog.htm
http://www.astro.ucla.edu/~wright/cosmology_faq.html

WMAP: Foundations of the Big Bang theory
http://map.gsfc.nasa.gov/m_uni.html

WMAP: Tests of Big Bang Cosmology
http://map.gsfc.nasa.gov/m_uni/uni_101bbtest.html

> "Because the universe has a finite age (~13.7 billion years) we can only see a finite distance out into space: ~13.7 billion light years. This is our so−called horizon."
>
> So ... the things we are observing at a distance of 13.7b light years appear as they were at about the time of the Big Bang? What are we seeing when we perceive an apparent void beyond that?

We can't see beyond that observable horizon... and light hasn't had time to travel further.

> "The Big Bang Model does not attempt to describe that region of space significantly beyond our horizon − space−time could well be quite different out there."

Physics News Update −− Number 685, May 12, 2004
by Phil Schewe and Ben Stein
Ref: http://www.aip.org/pnu/2004/685.html

Our Universe Has a Topology Scale of at least 24 GPC

Our universe has a topology scale of at least 24 Gpc, or about 75 billion light years, according to a new analysis of data from the Wilkinson Microwave Anisotropy Probe (WMAP).

What does this mean? Well, because of conceivable hall−of−mirrors effects of spacetime, the universe might be finite in size but give us mortals the illusion that it is infinite. For example, the cosmos might be tiled with some repeating shape, around which light rays might wrap themselves over and over ("wrap" in the sense that, as in video games, something might disappear off the left side of the screen and reappear on the right side).

A new study by scientists from Princeton, Montana State, and Case Western looks for signs of such "wrapped " light in the form of pairs of circles, in opposite directions in the sky, with similar patterns in the temperature of the cosmic microwave background. If the universe were finite and actually smaller than the distance to the "surface of last scattering" (a distance that essentially constitutes the edge of the "visible universe," and the place in deep space whence comes the cosmic microwaves), then multiple imaging should show up in the microwave background.

But no such correspondences appeared in the analysis. The researchers are able to turn the lack of recurring patterns into the form of a lower limit on the scale of cosmic topology, equal to 24 billion parsecs, a factor of 10 larger than previous observational bounds. (Cornish, Spergel, Starkman, Komatsu, Physical Review Letters, upcoming article; contact Neil Cornish, 406−994−7986, corn...@xxxxxxxxxxxxxxxxxxx)

> Why on earth should it be? Unless our understanding of space−time in the observable field is just as much a function of the conditions of observation as how it actually is. In other words, the Big Bang Model is just as easily understood as a model of human thought and perception, as of the origin of the universe.

Isn't everything?

.