Alternative Cosmology Group Newsletter - August 2007

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Beginning with this newsletter, we will provide some more explanation for non-astronomer readers.

More on Asymmetries

Three papers this month deal with the continuing problem of how to explain the anisotropies, or small variations in the intensity, of the cosmic background radiation (CBR) detected by the WMAP satellite. The problem for conventional cosmology is that the Big Bang theory strongly predicts that variations in the CBR should be randomly scattered across the sky, and the data show that they are not random, with alignments of variations and excessive “hot” and “cold” spots that contradict the theory.

In the first article, by Lawrence Rudnick et al, which has been widely reported in the scientific press, a survey of faint radio sources, each a distant galaxy, has turned up a region of the sky where such sources are about a third less common than the average in the sky, the largest variation on the sky. This spot turns out to correspond to the coldest spot in the CBR. Rudnick hypothesizes that a very large void in the distribution of galaxies, some 280 Mpc in diameter, (800 million light years), could have caused the both the variation in the radio sources and the cold spot. Such a void would interact with the photons of the CBR to create the cold spot.

However, such a void would be so large, it would create problems of its own for the Big Bang theory—there would be too little time to form such a vast void. In addition, the exact dimension of the void are not determined from the radio source data, since there is no distance data –redshifts—available. No doubt optical telescopes will probe the region in the near future, obtaining redshift data and determining the size and distance of such a huge void.

Extragalactic Radio Sources and the WMAP Cold Spot
Authors: Lawrence Rudnick, Shea Brown, Liliya R. Williams
http://arxiv.org/abs/0704.0908v2

A second paper confirms that the CBR is not symmetrical, as conventional theory predicts, but is asymmetrical on both large and small scales.

Testing Isotropy of Cosmic Microwave Background Radiation
Authors: Pramoda Kumar Samal, Rajib Saha, Pankaj Jain, John P. Ralston
http://arxiv.org/abs/0708.2816v1

A third paper on this subject raises doubts that the radio radiation from our own galaxy can be so accurately subtracted from the CBR observed by WMAP that the precision claimed for CBR measurements are valid.

Some doubts on the validity of the foreground Galactic contribution subtraction from microwave anisotropies
Authors: M. Lopez-Corredoira
http://arxiv.org/abs/0708.4133v1

Asymmetries are found in the universe in other ways. Michael J. Longo, who had previously shown that there was an alignment in the direction of spin of thousands of spiral galaxies across a huge stretch of the universe, shows the same alignment for elliptical galaxies. Such a spin alignment could have been crated by a huge ordered magnetic field in a large region of the universe, much as metal filings align with small magnetic fields.

Title: The Axis of Opportunity: The Large-Scale Correlation of Elliptical Galaxies
Authors: Michael J. Longo
http://arxiv.org/abs/0708.4013

No super-bright local galaxies

Finally, perhaps modesty led your editor to accidentally omit an article that he co-authored from the June-July newsletter. Riccardo Scarpa, Renato Falamo and I studied the surface brightness (luminosity divided by apparent surface area) of distant galaxies in comparison with nearby galaxies. This question is of cosmological importance, because if the universe is expanding, the surface brightness of distant galaxies will be much less than that of nearby ones. But if it is not expanding, the surface brightness will be the same. It turns out that the surface brightness is in fact the same. The conventional, Big Bang, explanation of this observation is that the distant galaxies have extremely high intrinsic surface brightness but with cosmological dimming, by coincidence, they appear to have the same surface brightness as nearby ones.

But do such extremely bright galaxies exist at all in the nearby universe? And are they even possible? An earlier paper by Hoopes et al had claimed to have discovered such super-high-surface- brightness galaxies in the nearby universe. But this paper points out the errors in their analysis, indicating that no such super-galaxies have been found locally. There is more to come in this debate!

Title: Do local analogs of Lyman Break Galaxies exist?
Authors: Riccardo Scarpa, Renato Falomo, Eric Lerner
http://arxiv.org/abs/0706.2948