

2013 Planck data reveals non-Copernican universe: nullifies Big Bang inflation theory

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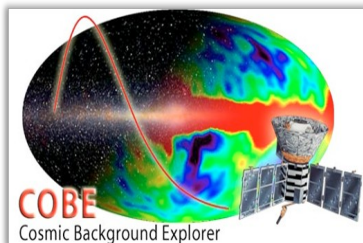
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This paper shows that the data released on March 21, 2013 from the 2009 Planck probe of the European Space Agency confirms the data from the 1989 COBE (Cosmic Background Explorer) and the 2001 WMAP (Wilkinson Microwave Anisotropy Probe) of NASA that the universe is not isotropic and homogeneous on large scales; rather, it displays a marked anisotropy and inhomogeneity, therefore nullify the Friedmann-Lemaître-Robertson-Walker (FLRW) interpretation of Einstein's field equations that proposed isotropy and homogeneity; as well as falsifying the "inflation" theory originated in 1980 by Alan Guth as a solution to the "horizon problem," as well as nullifying the need for Dark Matter and Dark Energy to propel expansion, as well as revealing by distinct positioning of the dipole, quadrupole and octupole harmonics of the CMB (cosmic microwave background radiation) that the famed "Axis of Evil" connecting the rim of the universe with the Earth can no longer be considered a mere artifact but is indeed in the data and shows that the CMB dipole intersects the quadrupole/octupole at the Earth's ecliptic and equinoxes, respectively, therefore putting the Earth in a central and non-Copernican place in the universe.

1. Introduction

In the same year that Penzias and Wilson received their Nobel Prize for discovering the CMB (1978) and putting the presumed capstone on the Big Bang universe, scientific papers were submitted showing that the CMB contained significant anisotropies.[1] If true, this would be a big blow to the Big Bang theory. In 1925, Alexander Friedmann had already adjusted Einstein's field equations (popularly known as the FLRW equations) and he provided a perfectly isotropic and homogeneous universe that would expand indefinitely without distinction and thereby bolster the Big Bang and negate a special location for the Earth.

About ten years later, in 1989, NASA launched the Cosmic Background Explorer (COBE), also referred to as Explorer 66, to investigate the CMB more closely.



According to Wikipedia, "This work provided evidence that supported the Big Bang theory of the universe: that the CMB was a near-perfect black-body spectrum and that it had very faint anisotropies" and it was considered "the starting point for cosmology as a precision science." [2] The COBE project was prompted by the

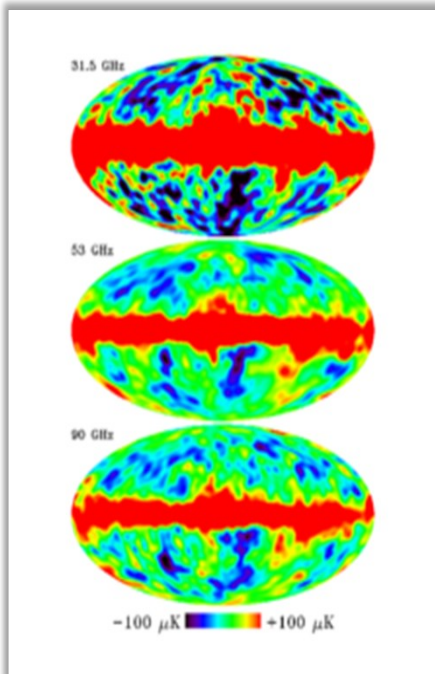
discovery in 1981 by David Wilkinson of Princeton and Francesco Melchiorri of the University of Florence who, using balloon-borne instruments, detected a quadrupole distribution of the CMB. This meant that the CMB had four pockets of temperature that deviated from the established figure of 2.725°K. Most astounding was that these four pockets were situated in the universe such that they straddled the Sun/Earth ecliptic plane (although this fact is left out of the Wikipedia article). The alignment of the ecliptic with the CMB can be seen in the official sky map below. The thick red line in the middle is the Milky Way, but the dark blue and light red portions above and below the middle make up the CMB quadrupole that aligns with the Sun-Earth ecliptic.

The shocking fact about the CMB is that it is aligned with our solar system, but our solar system is inside a 93 billion light-years universe, thus our solar system is only 10^{-17} % of the size of the universe. How could such a tiny be the hub for the rest of the universe? It is comparable to a pea being the hub of the Milky Way. Rather than probe this astounding mystery, attempts were made to make COBE fit the Big Bang theory which, although it formerly predicted a smooth and random distribution of the CMB (isotropy) was now saying that the CMB's temperature fluctuations (anisotropy) was "intrinsic" and allowed the Big Bang to have a vehicle for galaxy formation, yet with no explanation from particle physics how such a mechanism originates within the parameters of Big Bang theory. Instead, it is preempted by the conclusion that "Data from COBE showed a perfect fit between the black body curve predicted by big bang theory and that observed in the microwave background." [3]

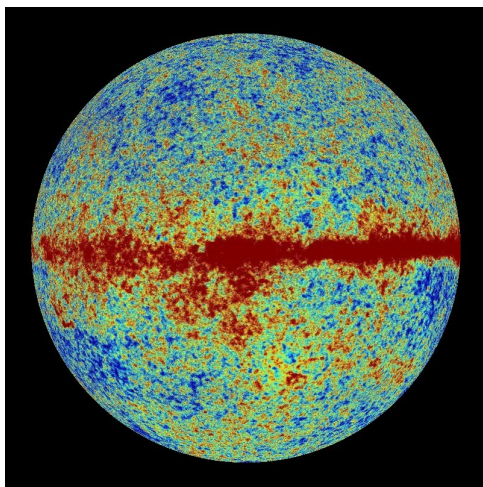
Other attempts at redefining the anisotropy of the CMB come from the highest echelons of modern cosmology. For example, Brian Greene relates the anisotropy of the CMB to the as yet unfound Dark

Energy and concludes that both work together to form galaxies and planets:

In universes with larger amounts of dark energy, whenever matter tries to clump into galaxies, the repulsive push of the dark energy is so strong that the clump gets blown apart, thwarting galactic formation. In universes whose dark-energy value is much smaller, the repulsive push changes to an attractive pull, causing those universes to collapse back on themselves so quickly that again galaxies wouldn't form. And without galaxies, there are no stars, no planets, and so in those universes there's no chance for our form of life to exist.[4]



COBE's 1990 Mapping of the CMB



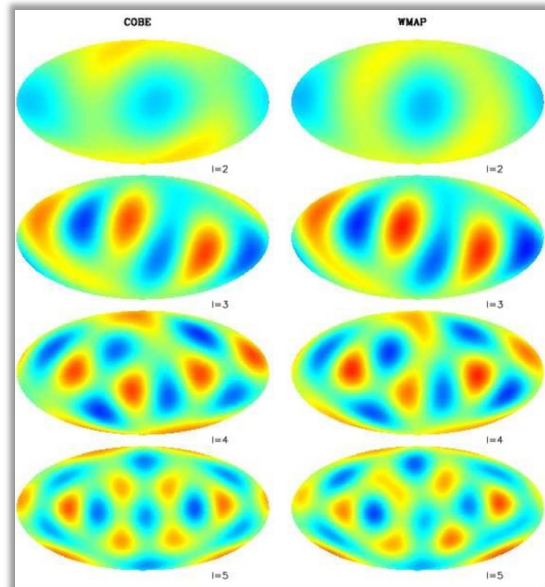
COBE's results on the sphere of the universe

Stephen Hawking is a little more specific:

But according to the theory, the expansion caused by inflation would not be completely uniform, as predicted by the traditional big bang picture. These irregularities would

produce minuscule variations in the temperature of the CMB in different directions. The variations are too small to have been observed in the 1960s, but they were first discovered in 1992 by NASA's COBE satellite, and later measured by its successor, the WMAP satellite, launched in 2001.[5]

Hawking ignores the astounding fact that the anisotropy of the CMB is aligned with our solar system, and instead turns the anisotropy into a cause for galaxies and planets to form from the Big Bang. This shows that modern science will avoid interpretations of the data that go against the Copernican Principle and instead put forth *ad hoc* interpretations to preserve their paradigms.



Comparison of the 1989 COBE Results with 2001 WMAP Results [6]

The fact remains, however, that the Big Bang theory predicted isotropy, not anisotropy. In fact, in 1973 Misner, Thorne and Wheeler had previously attributed the aforementioned blackbody curve to the isotropy of the CMB. They write:

The expansion of the universe has redshifted the temperature of the freely propagating photons in accordance with the equation $T \propto 1/a$. As a consequence, today they have a black-body spectrum with a temperature of 2.7 K...Because it is initially in thermal equilibrium with matter, this primordial radiation initially has a Planck black-body spectrum...that radiation with a Planck spectrum as viewed by one observer has a Planck spectrum as viewed by all observers...[7]

Others also noted the difficulty of fitting the COBE results with Big Bang theory. Jeremy Goodman of Princeton, presuming like Misner, *et al* that "the isotropy of the universe on large scales is well established..."

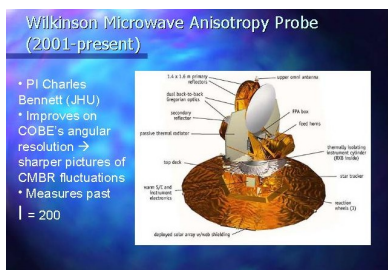
Results from the Cosmic Background Explorer Satellite (COBE) show that the temperature of the microwave background (CMB) deviates slightly from isotropy, but only at the level $(\Delta T/T)_{\text{ms}} \approx 1.1 \times 10^{-5}$ on angular scales $\geq 10^\circ$, apart from a dipole pattern that is conventionally attributed to the peculiar velocity of the Sun and the Galaxy....There may exist 'standard candles' at $z/1$, such as Type I supernovae. Among homogeneous Friedmann models, unfortunately, the shape of the magnitude-redshift relation

for standard candles already depends on two parameters: the density parameter, Ω , and the cosmological constant, Λ . Only superb data will permit one to fit for a third parameter and thereby constrain the homogeneity of the universe on the scale of the present horizon.[8]

60° in Virgo.”[12] Just like COBE, the WMAP showed that the 93 billion light year diameter universe was in direct alignment with the 93 million mile distance between the sun and the Earth – a ratio of 10^{-17} to 1.

2001 Wilkinson Microwave Anisotropy Probe (WMAP)

Although the science community tried to put a lot of cosmetic makeup over the anisotropies of the CMB to make them presentable to the Copernican Big Bang audience,[9] the gnawing feeling persisted that all was not well. Trying to avoid the alignment of the universe with the tiny ecliptic of the Sun-Earth was like trying to avoid the rain without an umbrella. Plans were then made in the late 1990s to test whether the anisotropies of COBE were, indeed, the reality. The new project was named after the original discoverer of the CMB anisotropies in 1981, David T. Wilkinson. The name *Wilkinson Microwave Anisotropy Probe* showed that the main quest was to search out the extent and meaning of these bothersome and unpredicted temperature fluctuations of the universe’s design. The results were nothing less than astounding. WMAP produced even clearer confirmation that the universe was aligned with the Earth as its hub.



Max Tegmark of the Massachusetts Institute of Technology was the first to see these results. As he relates the story of his discovery, it was late in the evening and he was about ready to retire for the night but decided to press the final button that gave the clearest image of the WMAP results. The first words out of his mouth were “wow!” followed by a long pause of amazement.[10] His findings were reported by the BBC:

“We found something very bizarre; there is some extra, so far unexplained structure in the CMB. We had expected that the microwave background would be truly isotropic, with no preferred direction in space but that may not be the case.” [BBC: Looking at the symmetry of the CMB - measures technically called its octopole and quadrupole components - the researchers uncovered a curious pattern. They had expected to see no pattern at all but what they saw was anything but random]. “The octopole and quadrupole components are arranged in a straight line across the sky, along a kind of cosmic equator. That’s weird. We don’t think this is due to foreground contamination,” Dr Tegmark said. “It could be telling us something about the shape of space on the largest scales. We did not expect this and we cannot yet explain it.”[11]

The WMAP image showed the exact same results as the COBE image, only with more clarity. The Sun-Earth ecliptic plane (the black line) was precisely in the center, between the red poles (hotter regions) and the blue poles (colder regions) – a difference of 50mK or 50 millionths of a degree Kelvin from the 2.725°Kelvin of the remaining CMB. In Tegmark’s words: “Intriguingly, both the quadrupole and the octopole are seen to have power suppressed along a particular spatial axis, which lines up between the two, roughly towards $(l, b) \sim (-110^\circ,$



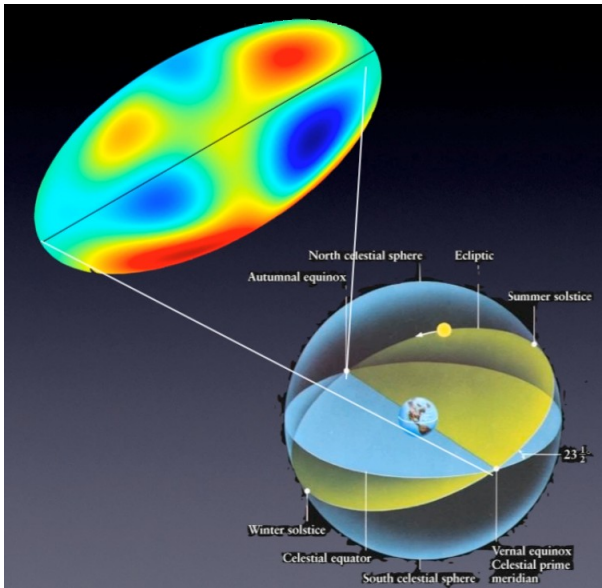
Tegmark's Original WMAP Image

In a 2004 publication, the team of Dominik Schwarz, Glenn Starkman, Dragan Huterer and Craig Copi admitted that the CMB poles were not only aligned with the Sun-Earth ecliptic, but also hint that they are aligned with the Earth’s equinoxes:

The large-angle correlations of the cosmic microwave background exhibit several statistically significant anomalies compared to the standard inflationary cosmology...the quadrupole-octopole correlation is excluded from being a chance occurrence in a gaussian random statistically isotropic sky at $>99.87\%$The correlation of the normals [perpendicular vectors] with the ecliptic poles suggest an unknown source or sink of CMB radiation or an unrecognized systematic. If it is a physical source or sink in the inner solar system it would cause an annual modulation in the time-ordered data...Physical correlation of the CMB with the equinoxes is difficult to imagine, since the WMAP satellite has no knowledge of the inclination of the Earth’s spin axis.[13]

In a 2010 paper, the team is even more astounded at the Earth-centered results of WMAP. In this study, galactocentrism (of the Milky Way) is eliminated in favor of an Earth-centered explanation:

Particularly puzzling are the alignments with solar system features. CMB anisotropy should clearly not be correlated with our local habitat. While the observed correlations seem to hint that there is contamination by a foreground or perhaps by the scanning strategy of the telescope, closer inspection reveals that there is no obvious way to explain the observed correlations. Moreover, if their explanation is that they are a foreground, then that will likely exacerbate other anomalies that we will discuss in section IVB below. Our studies indicate that the observed alignments are with the ecliptic plane, with the equinox or with the CMB dipole, and not with the Galactic plane: the alignments of the quadrupole and octopole planes with the equinox/ecliptic/dipole directions are much more significant than those for the Galactic plane. Moreover, it is remarkably curious that it is precisely the ecliptic alignment that has been found on somewhat smaller scales using the power spectrum analyses of statistical isotropy. [14]



The CMB Dipole is aligned with the Earth's equinoxes

Finally, in a 2012 paper, there appears to be no deviation from their previous conclusions, although perhaps some hand-wringing.

We will discover that if one uses the full-sky ILC map then one finds very odd correlations in the map, that correlate unexpectedly to the Solar System... Looking into this anomaly more deeply we will find that it remains robust through all seven years of published WMAP data...

...quadrupole planes and the three octopole planes, implying that not only are these four planes aligned but they are nearly perpendicular to the ecliptic. Furthermore the normals [perpendicular vectors] are near the dipole, meaning that the planes are not just aligned and perpendicular to the ecliptic but oriented perpendicular to the Solar System's motion through the Universe... However one does the statistical analysis, these apparent correlations with the Solar System geometry are puzzling. They do not seem to reflect the Galactic contamination that we might have expected from residual foreground contamination in the ILC map... For one, the observed quadrupole and octopole are aligned... This makes it difficult to explain them in terms of some localized effect on the sky... The best one can say is that these full-sky solar-system correlations remain unexplained.

The CMB anisotropies are analogous to the warm and cool spots in the Earth's ocean being aligned with the Earth's equator and its 23.5 degree ecliptic angle, except in this case we are speaking of the whole universe, an astounding phenomenon, predicted by no model, except the Tychonic.

The same team emphasizes several times in their paper that the CMB anisotropy does not match that which is predicted or accepted in the Big Bang model.

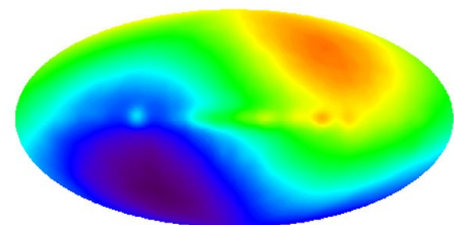
...and furthermore that it is very difficult to explain within the context of the canonical Inflationary Lambda Cold Dark Matter of cosmology [*i.e.*, the Big Bang]... Our first observation is that none of those data curves look like the [LCDM] theory curve... It is extremely difficult to arrange for the C_l to have particular relative values in the context of the standard inflationary model... the observed sky, at least the part outside the Galaxy cut, seems not to respect the

fundamental prediction of the standard cosmological model that the a_{lm} are independent random variables... for the lowest multipoles and the largest angular scales, the observations disagree markedly with the predictions of the [Big Bang] theory. [15]

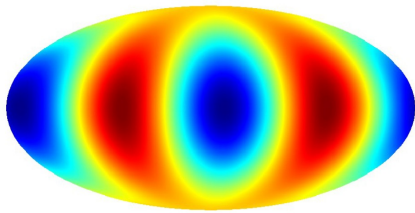
The harmonic multipoles of the CMB are analogous to the harmonics of musical vibrations. When a string on a violin is plucked it vibrates very fast. In turn, the air molecules vibrate and sound waves travel to our ear. But the note made by the violin makes the string vibrate in a very complex manner. First, is the basic or fundamental note, but many other notes appear that, when all the notes are combined, makes the sound that is unique to a violin as opposed to a cello. For example, the note A above middle C vibrates at 440 hertz or 440 times per second, which is the "fundamental" or "first harmonic." The second harmonic vibrates twice as fast at 880 hertz or a 2:1 ratio, which is the A an octave higher. The third harmonic vibrates at 1320 hertz or with a ratio of 3:2, which will be the E an octave and a fifth above the fundamental note. So on and so on the harmonics are created. The higher the harmonic the quieter the note, but the ratio to create a harmonic is always a whole number.

In a similar way, the CMB monopole is the fundamental note, but can then be divided into higher harmonics, such as dipole, quadrupole and octupole. Whereas the various harmonics of musical notes will create a different tone, the CMB harmonics will create different orientations or directions for the microwaves. The astounding fact for the CMB harmonics is that all of them point to ecliptic and equator of the Earth.

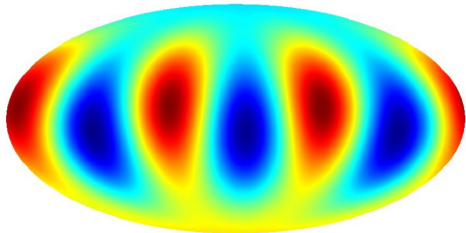
Harmonics of musical notes analogous to CMB harmonics



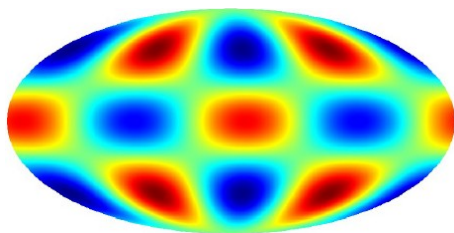
CMB: $l = 1$ (dipole)



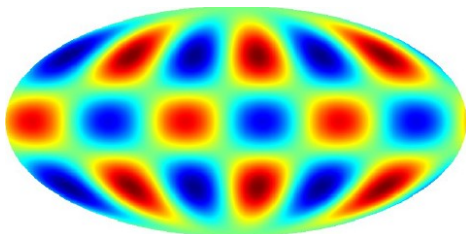
CMB: $l = 2$ (quadrupole); $m = 2$ (shape); ratio = 0.957



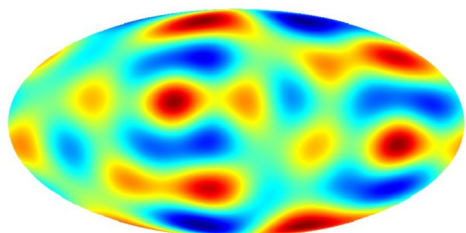
CMB: $l = 3$ (octopole); $m = 3$ (shape); ratio = 0.942



CMB: $l = 4$; $m = 2$; ratio = 0.875



CMB: $l = 5$; $m = 3$; ratio = 0.895



CMB: $l = 6$; $m = 1$; ratio = 0.802¹ [16]

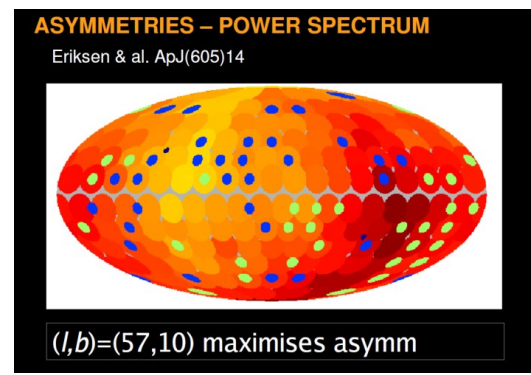
All in all, the cosmological statistics show that an alignment of the CMB quadrupole and octupole with the Earth is a 0.1% chance. That the normals [perpendicular vectors] are aligned with the Earth's equinoxes and dipole is a 0.4% chance. That three of the normals are orthogonal [perpendicular] to the Earth's ecliptic is a 0.9% chance. In light of the fact that these universal alignments could not have happened by chance, in an article for *Scientific American*, Schwarz and Starkman also admit that the CMB data does not fit with the Big Bang since, as we noted earlier, Big Bang cosmology did not predict the CMB anisotropies. Comparing the CMB temperature differences to the sounds of an orchestra, they find that "Certain of those harmonics are playing more quietly than they should be.... These bum notes mean that the otherwise very successful standard model of cosmology [the Big

Bang] is flawed – or that something is amiss with the data." [17] Toward the end of the article Schwarz and Starkman more or less discount that something is wrong with the data, leaving the Big Bang theory itself as the culprit:

Yet the WMAP team has been exceedingly careful and has done numerous cross-checks of its instruments and its analysis procedure. It is difficult to see how spurious correlations could accidentally be introduced. Moreover, we have found similar correlations in the map produced by the COBE satellite.... The results could send us back to the drawing board about the early universe. [18]

Schwarz and Starkman refer to the study of Tegmark and Oliveira-Costa we covered above, noting that the "preferred axes of the quadrupole modes... and the octopole modes... were remarkably closely aligned" (*i.e.*, geocentric), and they add the study of Hans Kristian Eriksen in 2003 at the University of Oslo, citing that:

What they found contradicted the standard inflationary cosmology – the hemispheres often had very different amounts of power. But what was most surprising was that the pair of hemispheres that were the most different were the ones lying above and below the ecliptic, the plane of the earth's orbit around the sun. This result was the first sign that the CMB fluctuations, which were supposed to be cosmological in origin... have a solar system signal in them – that is, a type of observational artifact. [19]



[20]

The significance of Eriksen's finding is that all the radiation in the universe, whether it is symmetric or asymmetric, is centered around the Earth. This is confirmed when Schwarz, *et al.*, state later: "Within that plane, they sit unexpectedly close to the equinoxes – the two points on the sky where the projection of the earth's equator onto the sky crosses the ecliptic." In other words, all the data show that, as far out as our telescopes can see, space is oriented geocentrically. What are the chances that this could happen by accident? The team of Copernicans had to admit that the "combined chance probability is certainly less than one in 10,000." So upsetting is this evidence to the scientific *status quo* that another magazine, *New Scientist*, labeled the same universal orientation around Earth's equatorial plane as, "THE AXIS OF EVIL," since this geocentric picture virtually destroys its cherished Copernican principle. [21] This phrase was taken by a paper written by Kate Land and João Magueijo in a 2005 paper appropriately titled, "The Axis of Evil."

RESULTS

'AXIS OF EVIL'
Land & Magueijo PRL(95)071301

- **SHAPES** m_l
Not just favouring one shape. Not always planar.
- **RATIOS** r_l
Not significant – some 'm preference' is normal.
- **DIRECTIONS** n_l
Highly correlated for $l = 2,3,4,5$

All find direction $(l,b) \sim (-110,60)$
Rejected by 99.9%

[22]

Almost as if they know that Copernicanism is about to be overturned by the CMB evidence, they begin the paper assuring their audience that “The homogeneity and isotropy of the Universe – also known as the Copernican principle – is a major postulate of modern cosmology....One may expect that the ever improving observations of CMB fluctuations should lead to the greatest vindication of this principle.” But in the same breath they admit “there have been a number of disturbing claims of evidence for a preferred direction in the Universe” (*i.e.*, geocentric) and that “These claims have potentially very damaging implications for the standard model of cosmology” (*i.e.*, the Big Bang). They add that they hope “the observed ‘axis of evil’ could be the result of galactic foreground contamination” but in the end admit they were “unable to blame these effects on foreground contamination or large-scale systematic errors” and are desperately hoping to find an answer to this “anomaly” in order to save the Copernican principle.[23]

In a *New Scientist* article of July 2005 with what many would consider a career-ending title, “Did the big bang really happen?” Marcus Chown covered Land and Magueijo’s “Axis of Evil” paper in great detail. The implications are staggering for modern cosmology. Chown writes:

Yet there is more evidence that there could be something wrong with the standard model of cosmology. And it is evidence that many cosmologists are finding harder to dismiss because it comes from the jewel in the crown of cosmology instruments, the Wilkinson Microwave Anisotropy Probe. “It could be telling us something fundamental about our universe, maybe even that the simplest big bang model is wrong,” says João Magueijo of Imperial College London. Since its launch in 2001, WMAP has been quietly taking the temperature of the universe from its vantage point 1.5 million kilometres out in space. The probe measures the way the temperature of the cosmic microwave background varies across the sky.

...because the cosmic background radiation is a feature of the universe as a whole rather than any single object in it, none of the hot or cold regions should be aligned with structures in our corner of the cosmos. Yet this is exactly what some researchers are claiming from the WMAP results.

Earlier this year, Magueijo and his Imperial College colleague Kate Land reported that they had found a bizarre alignment in the cosmic microwave background. At first glance, the pattern of hot and cold spots appeared random, as expected. But when they looked more closely, they found something unexpected. It is as if you were listening to an anarchic orchestra playing some random cacophony, and yet when you picked out the violins, trombones and

clarinets separately, you discovered that they are playing the same tune.

Like an orchestral movement, the WMAP results can be analysed as a blend of patterns of different spatial frequencies. When Magueijo and Land looked at the hot and cold spots this way, they noticed a striking similarity between the individual patterns. Rather than being spattered randomly across the sky, the spots in each pattern seemed to line up along the same direction. With a good eye for a newspaper headline, Magueijo dubbed this alignment the axis of evil. “If it is true, this is an astonishing discovery,” he says.

That’s because the result flies in the face of big bang theory, which rules out any such special or preferred direction. So could the weird effect be down to something more mundane, such as a problem with the WMAP satellite? Charles Bennett, who leads the WMAP mission at NASA’s Goddard Space Flight Center in Greenbelt, Maryland, discounts that possibility. “I have no reason to think that any anomaly is an artifact of the instrument,” he says.

“The big question is: what could have caused it,” asks Magueijo. One possibility, he says, is that the universe is shaped like a slab, with space extending to infinity in two dimensions but spanning only about 20 billion light years in the third dimension. Or the universe might be shaped like a bagel.

Interestingly enough, Magueijo concludes by showing how a geocentric cosmology with a rotating universe is one viable solution to the WMAP evidence:

Another way to create a preferred direction would be *to have a rotating universe*, because this singles out the axis of rotation as different from all other directions.[24]

Earlier in the article Chown shows additional implications for WMAP’s discoveries against the Big Bang.

What if the big bang never happened?...“Look at the facts,” says Riccardo Scarpa of the European Southern Observatory in Santiago, Chile. “The basic big bang model fails to predict what we observe in the universe in three major ways.” The temperature of today’s universe, the expansion of the cosmos, and even the presence of galaxies, have all had cosmologists scrambling for fixes. “Every time the basic big bang model has failed to predict what we see, the solution has been to bolt on something new - inflation, dark matter and dark energy,” Scarpa says...

“This isn’t science,” says Eric Lerner who is president of Lawrenceville Plasma Physics in West Orange, New Jersey, and one of the conference organizers. “Big bang predictions are consistently wrong and are being fixed after the event.” So much so, that today’s “standard model” of cosmology has become an ugly mishmash comprising the basic big bang theory, inflation and a generous helping of dark matter and dark energy.

Chown adds Magueijo’s comment to this conclusion:

Clearly, such a universe would flout a fundamental assumption of all big bang models: that the universe is the same in all places and in all directions. “People made these assumptions because, without them, it was impossible to simplify Einstein’s equations enough to solve them for the universe,” says Magueijo. And if those assumptions are wrong, it could be curtains for the standard model of

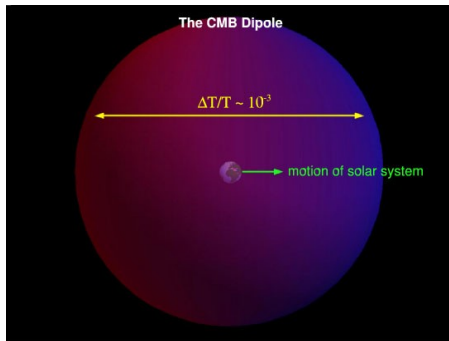
cosmology. That may not be a bad thing, according to Magueijo. “The standard model is ugly and embarrassing,” he says. “I hope it will soon come to breaking point.” But whatever replaced it would of course have to predict all the things the standard model predicts. “This would be very hard indeed,” concedes Magueijo. [25]



99.99% certainty of the “Axis of Evil” [26]

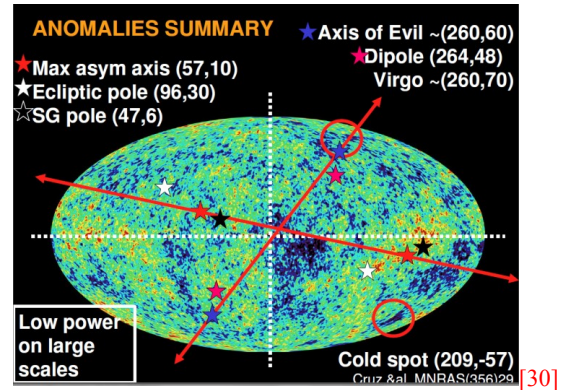
Attempted Explanations

In an attempt to lessen the severity of the *Axis of Evil* against the Copernican Principle, some try to separate the dipole from higher l values (quadrupole, octupole, etc.) and claim that the dipole is caused by “the peculiar velocity of the Earth relative to the co-moving cosmic rest frame as the planet moves at some 371 km/s towards the constellation Leo.” [27]



[28]

There are two glaring anomalies in this claim. First, as John Ralston points out, in such solutions they are “forgetting there is an unknown cosmological piece,” namely, “By an apparently random accident the dipole happens to lie in the plane of the ecliptic, and point along Virgo. [29] This is accepted with very little discussion, and nobody disbelieves the dipole.” In other words, attributing the dipole to a movement of the Earth through the CMB is convenient enough, but it becomes a little too convenient when that movement is pointing to Virgo, which just happens to be in the same direction as the “Axis of Evil.” Even if it were true that the Earth is moving against the CMB (and not vice-versa, as in the geocentric system), still, this explanation misses the elephant in the room, *i.e.*, that the entire universe, as represented by the CMB dipole, is aligned with the tiny Earth.



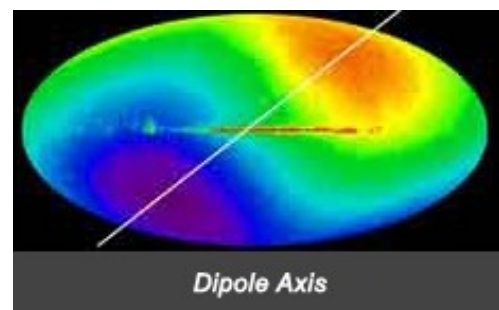
–Double arrow at 7:00 o’clock to 1:00 o’clock is the Axis of Evil and the CMB Dipole, with upper arrow pointing to Virgo-Leo and about 23.5 degrees off center.

–Double arrow at 10:00 o’clock to 4:00 o’clock is Asymmetric Axis aligned with the Sun-Earth ecliptic and is formed by the CMB quadrupole and octupole

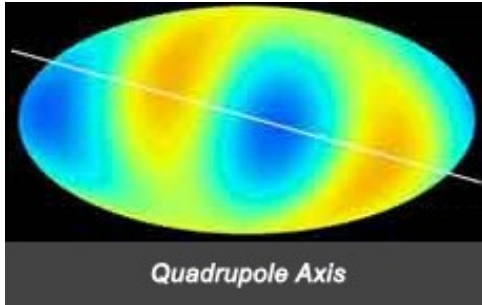
Second, we will notice from the graphs that the dipole axis is almost perpendicular to the quadrupole/octupole axis. Big Bang cosmology claims that the dipole axis is created by the sun-earth system moving through the CMB, which creates a Doppler blue shift. But how does Big Bang cosmology then explain the quadrupole/octupole axis, which is perpendicular to the dipole axis? It cannot be created by a movement of the sun-earth system through the CMB since, obviously, the sun-earth system cannot be going in one direction to create the dipole and, at the same time, going in an orthogonal direction to create the quadrupole and octupole. Something is definitely amiss here. [31]



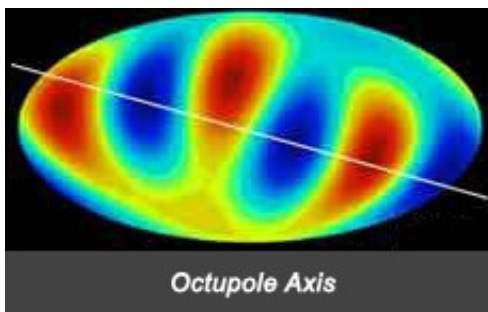
Dipole axis runs between Leo and Virgo



The Axis connecting the two largest CMB formations



The Axis connecting the four major CMB formations



The Axis connecting the eight major CMB formations

In 2006, one of the more notable modern cosmologists, Lawrence Krauss of Arizona State University, wrote a paper titled “The Energy of Empty Space is Not Zero,” which made this startling conclusion:

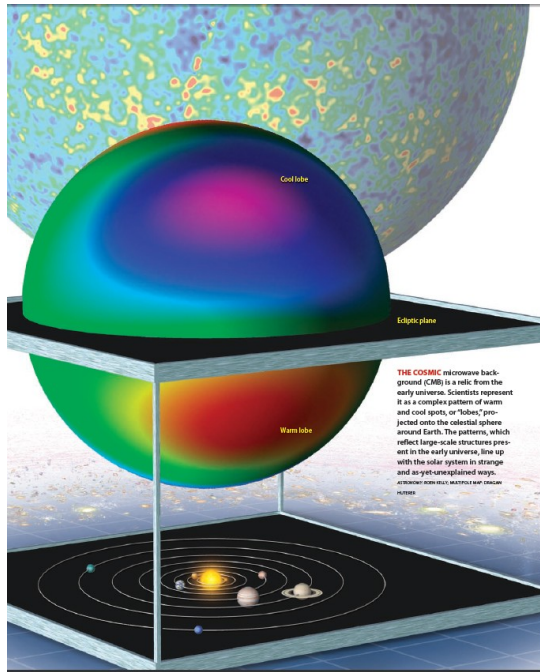
But when you look at CMB map, you also see that the structure that is observed, is in fact, in a weird way, correlated with the plane of the earth around the sun. Is this Copernicus coming back to haunt us? That’s crazy. We’re looking out at the whole universe. There’s no way there should be a correlation of structure with our motion of the earth around the sun — the plane of the earth around the sun — the ecliptic. That would say we are truly the center of the universe....The new results are either telling us that all of science is wrong and we’re the center of the universe, or maybe the data is simply incorrect, or maybe it’s telling us there’s something weird about the microwave background results and that maybe, maybe there’s something wrong with our theories on the larger scales.[32]

In 2007, Dragan Huterer of the University of Michigan published a paper in *Astronomy* titled, “Why is the solar system cosmically aligned.”[33] Huterer, although speaking with Copernican glasses, writes of the startling data found by the Wilinon Microwave Anisotropy Probe (WMAP):

Developing the multipole vectors allowed us to examine how the CMB’s large-scale features align with each other and the ecliptic — the plane of Earth’s orbit around the sun....Not only are the quadrupole and octopole planar, but the planes are nearly perpendicular to the ecliptic....The likelihood of these alignments happening by chance is less than 0.1 percent....Why CMB patterns are oriented to the solar system is not at all understood at this time.[34]

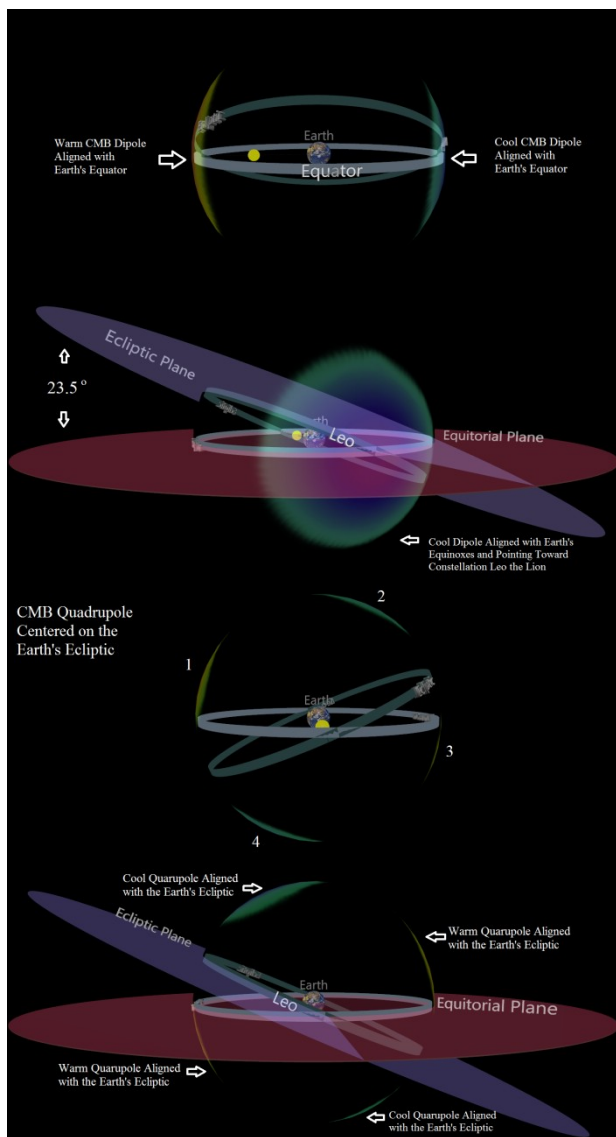
That Huterer and his colleagues do not understand why the CMB is oriented to our solar system is quite an understatement. It makes it appear that merely because they don’t understand it, then it is not significant. In reality, it is the most astounding fact that modern cosmology has discovered. As one scientist said, “it should make the hair stand up on the back of your neck.” That the whole universe is aligned with our solar system is like saying the Milky Way is aligned with a pea. Be that as it may, Huterer is also rather casual about the fact that the quadrupole and octopole are planar and nearly perpendicular to the ecliptic. In reality this means that we possess the X and Y coordinates of a universal graph with our solar system at point 0, 0. All that is needed now is the Z axis to show that our system is in the exact center of the universe (but which is not possible with only two-dimensional plotting afforded by WMAP). As it turns out, the dipole is aligned with the Earth’s equinoxes and the quadrupole and octopoles are aligned with the Earth’s ecliptic. Even more amazing is the fact that the alignment of the CMB with the Earth’s ecliptic and equinoxes will be seen from any observation point in space. In other words, if an observer were stationed on a galaxy 50 million light years from Earth, he would see the CMB aligned with only one region in the universe — the Earth’s ecliptic and equinoxes.

~



“The solar system seems to line up with the largest cosmic features. Is this mere coincidence or a signpost to deeper insights?”
Dragan Huterer, *Astronomy*, December 2007, pages 38-39

The CMB Dipole



With all this amazing evidence of a central Earth before him, what should Professor Huterer have concluded? He should have concluded the same that Dr. Lawrence Vescera concluded after he read Huterer's 2007 article. In "The Discovery that Dare Not Speak its Name" he writes:

Steven Hawking, arguably the world's greatest living astrophysicist, called it "the discovery of the millennium, if not all time." Hawking was referring to the anisotropies of the Universe. Anisotropies are variations or inhomogeneities in a structure. The anisotropies referred to here are the temperature variations in the Cosmic Microwave Background (CMB) radiation distributed across the Universe. These temperature variations were left behind by the original creation event: they are the after glow of The Big Bang from which the Universe emerged. These variations are tiny, amounting to only about 1/40,000 of a degree Celsius, but they are enormously consequential. It is from these minute variations that the current Universe developed its large scale structure of Galaxy Clusters and Super Clusters. This structure is also essential for the Universe to be able to support life.

This of course is all quite interesting, but a shocking new set of findings has emerged from the study of the CMB. It has been discovered that the CMB, which pervades the entire Universe, is aligned to the Solar System. This means that, the original creation event, which produced all of space, time, matter, and energy, was precisely fine tuned so that it is aligned with the location and direction of the Solar System in which we live.

This discovery has been so disturbing to some scientists that it has been most inappropriately labeled "The Axis of Evil." Since this discovery was first made in 2003, many scientists have been trying to disprove it. Researchers have been studying the CMB since 1965 when it was first found to exist. Through the years, more sensitive instruments have been developed which have allowed ever more accurate maps of the CMB to be drawn. The best known of these were the 1992 COBE and the 2003 WMAP satellite-based probes. The initial shock came when one alignment was discovered, but as work has progressed, instead of going away, at least three more of these "Cosmic Alignments" between the CMB and the Solar System have been uncovered.

The first discovery was that the original Creation Event was divided into two hemispheres, called a Dipole, with one warm lobe and one cool lobe. What researchers were shocked to find was that the plane of the Solar System sits at the exact division point, right in the middle of these two lobes. This means that the plane of the Earth's orbit around the Sun exactly divides these two hemispheres. It was further discovered that the direction of the Sun's motion around the center of our Galaxy is also closely aligned with this plane.

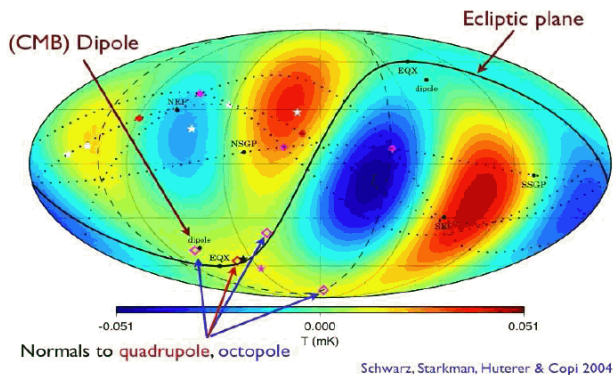
Within each of the lobes of the dipole there are other cool and warm areas that have been located. There are a quadrupole (four lobes) and an octopole (eight lobes). To the researchers amazement, it has also been discovered that these multipoles are also planar and additionally are perpendicular to the Earth's path around the sun. The likelihood of any of these alignments arising by chance is less than 1 in 1000.

One of the Primary Axioms of Materialist Philosophy is the Copernican Principle, sometimes known as the Mediocrity Principle. Simply stated, it is the opinion that humans are not privileged as observers or in anyway. Therefore, there should be nothing special about where we live in the Universe, about our Galaxy, Solar System, or Planet. The Copernican Principle was offered as a counter to the widely asserted medieval beliefs that the Earth was at the center of the Universe, that man was in an exalted place, and that God's existence was proved by these facts. Medieval scholars did not actually believe anything like this, but that is another story.

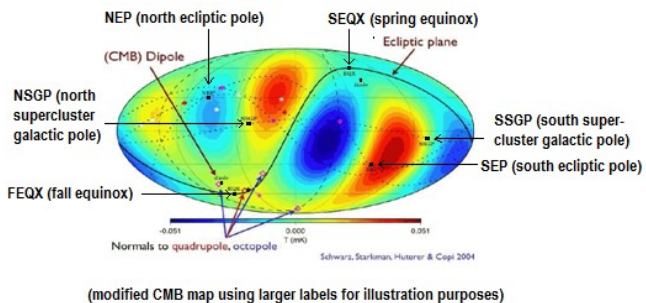
The discovery that the CMB is cosmically aligned to the Earth should make the hair on the back of your neck stand up. It points to the fact that the Earth is at a special place in the Universe and that God wants it to be known. In the source listed below, it is interesting to observe how the writers try to dance around this implication (the elephant in the room) without actually coming out and directly admitting the clear implication of these discoveries. We read for example, "The solar system seems to line up with the largest cosmic features. Is this mere coincidence or a sign post to deeper insight?" "Careful analysis have confirmed these alignments exist. But we don't know whether they are bizarre coincidences or if something more fundamental is at work." As similar "coincidences" from

every field of science are piling to the sky for all to see, the only ones who will not see are those who refuse to see.[35]

Perhaps the astounding realization that the whole universe was aligned with the Earth was just too much for some scientific researchers. We see this phenomenon, for example, in the image released in 2004 by the Michigan university team of Schwarz, Starkman, Huterer and Copi. The black ecliptic line across the middle (from Tegmark's original 2003 image) is replaced with a looping S-type line. Hence, in Schwarz's altered version, the plane of the Milky Way is now in the middle of the image, while the sun-earth ecliptic plane is removed from the center.



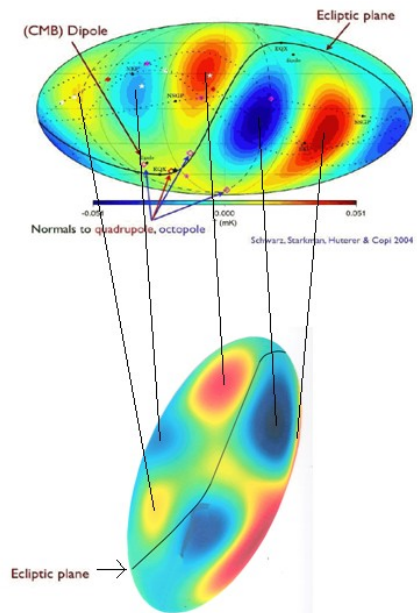
Now let's look at this Schwarz image with more defined labels for easier viewing.



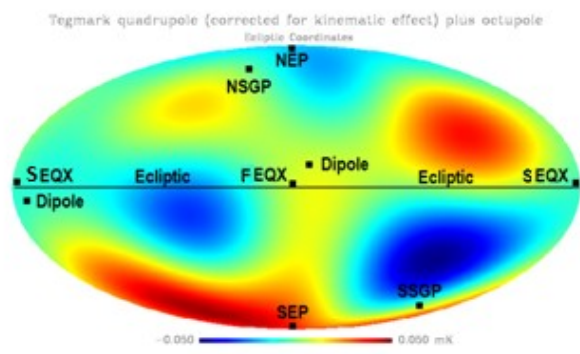
(modified CMB map using larger labels for illustration purposes)

The north and south poles of the local galactic supercluster are represented by the NSGP (north supercluster galactic pole) and the SSGP (south supercluster galactic pole), respectively, while the north ecliptic pole is represented by NEP (upper left) and the south ecliptic pole by SEXP (lower right). But there is really no reason to display the CMB in this way since it doesn't add any precision to the actual state of affairs and, in fact, shows that demonstrating the CMB by galactic coordinates is much less remarkable than using geocentric coordinates. This is noted by the dash-perforated line (as opposed to the dot-perforated line) which represents the equator of the supergalactic cluster. As one can see, the attempt to put the CMB in galactic coordinates resulted in an equatorial line that is off-center and has less geometrical relation to the dipole or quadrupole/octopole. This configuration is puzzling since in their 2010 paper they admit: "Our studies indicate that the observed alignments are with the ecliptic plane, with the equinox or with the CMB dipole, and not with the Galactic plane." Perhaps by 2010, after many studies over six years of the CMB's alignment with the Earth, they realized their 2004 galactic alignment would no longer suffice and a much more precise truth needed to be told – the whole universe was aligned with the Earth.

Another way to understand Schwarz's change is to note that Tegmark's original image would need to be tilted in order to have approximately the same S-line.

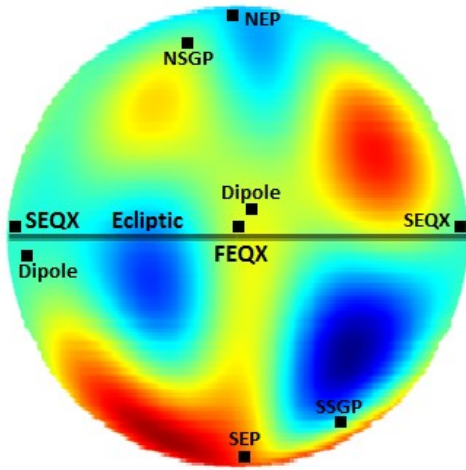


This leads us to conclude, of course, that the best representation of the relationship between Earth and the dipole/quadrupole/octopole is the original Tegmark graphic showing the hot and cold lobes on either side of the Earth's ecliptic plane. In fact, if we take the galactic coordinates used in the previous graphic (NSGP, SSGP, NEP, SEXP) and put them in the Tegmark graphic, it results in the following:



Original Tegmark 2003 image marked with Schwarz' 2004 labels

Notice that the fall equinox (FEQX in yellow area) is in the center with the dipole, while the spring equinox (SEXP in light blue/green area) is with the other dipole. The fall and spring equinoxes rest on the ecliptic, and the quadrupoles/octopoles (red and blue lobes) are on either side of the ecliptic, showing once again that the dipole straddles the ecliptic during the equinoxes while the quadrupole and octopoles are orthogonal to the ecliptic, which combination forms an X and Y axes with Earth directly in the center of it all.

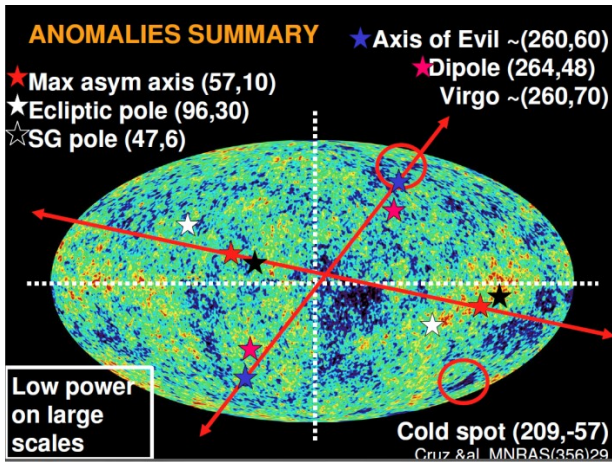


Same Tegmark image on the sphere of the universe

All the studies show that the characteristics of the CMB: (a) lean heavily against the Big Bang theory and (b) suggest that our local system (e.g., sun, Earth and planets) is either a central source or the central depository or “sink” for the CMB radiation. This means that the Earth and its neighbors are in the center of the phenomenon. The Copi team acknowledges that the positioning of the poles symmetrically above and beneath the ecliptic is to be interpreted as no accident. Even in the heliocentric model, the CMB poles could not position themselves in respect of the Earth’s rotation or translation since the poles have no reaction to such movement. In either model there can be no other conclusion than the orientation of the CMB is purely geocentric.

cosmologist has detected such a source in the solar system. In the end one can see how the team’s presuppositions determine how they will proceed to interpret the data. Their proposed solution sounds like the rationale for claiming that Dark Matter and Dark Energy exist even though they have found absolutely no evidence for them, even after searching for the last 40 years.[38] It is believed because it is needed to prop up the present paradigm. As always, the geocentric possibilities are summarily dismissed since such notions are, as we found earlier, “unthinkable” for the modern science community. The other possibility is that “the patterns seen by Dr. Starkman and his colleagues might simply be a fluke – an accidental alignment between the solar system and patterns in the CMB radiation.”[39] Another physicist said: “The precise directional coincidences with solar system alignments are certainly thought-provoking. It may look like a smoking gun...but I’m going with the fluke hypothesis for now.”[40] But the “fluke” hypothesis has been ruled out by a 99% confidence level in the collected data.

In a geocentric universe, the most likely reason for the CMB alignment with our equinoxes and ecliptic is the Coriolis force created by a rotating universe. Just as the Coriolis force will give direction to air and water currents on Earth (clockwise in the northern hemisphere and counterclockwise in the southern hemisphere), so it does with the heat distribution of the universe. In fact, comparing maps of the warm/cool deposits of the CMB with those of the maps of Earth’s air and water currents, the resemblance between the two is quite remarkable. Since in the geocentric system the Coriolis force is a real force created by rotating universe (and not merely an effect as it is in the heliocentric system), we would expect that its influence extends from the edge of the universe to the very center. It will thus induce movements of the CMB, as well as the rotation of galaxies and the oscillation of the Foucault pendulum.

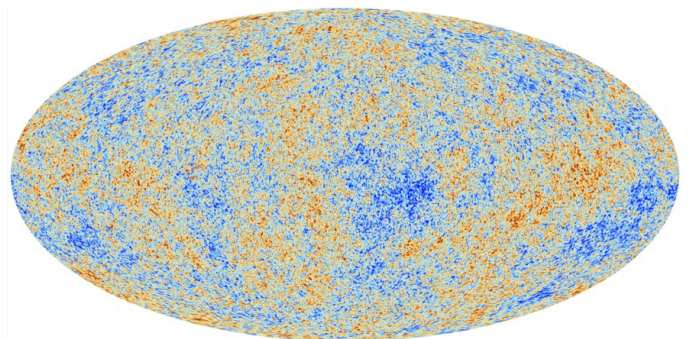


The Dipole axis intersects with the Quadrupole/Octupole axis, Forming an X and Y graph, with Earth at or very near the intersection point

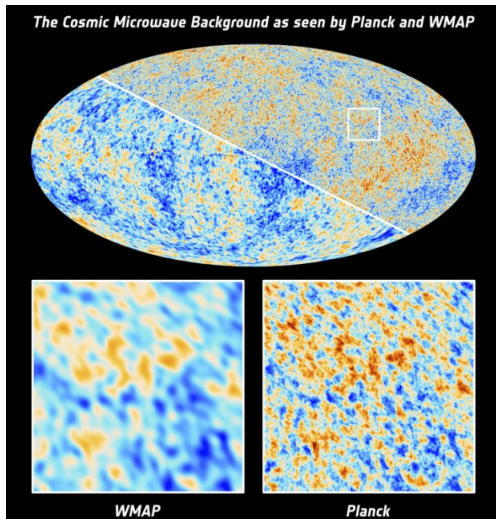
In a recent interview, speaking for the team, Glenn Starkman of Case Western University stated: “All this is mysterious. And the strange thing is, the more you delve into it, the more mysteries you find.” This is a polite way of saying that he is shocked that the CMB is geocentrically orientated, since that is the last thing he expected to find by working from a Big Bang model. Nevertheless, in an attempt to put a damper on the geocentric possibilities, Starkman adds: “None of us believe that the universe knows about the solar system, or that the solar system knows about the universe.”[36] “Far more plausible, he says, is that something within our solar system is producing or absorbing microwaves,”[37] but, of course, neither Starkman nor any other

The 2009 Planck Probe

The Planck probe was sent up into space in 2009 by the European Space Agency with assistance from NASA. Its results were released on March 21, 2013. Since the scanning beam had a much shorter wavelength than the 2001 WMAP probe, Planck provided a much clearer and detailed image of the CMB sky. The big question on everyone’s mind was whether Planck would confirm WMAP’s findings or deny them as mere artifacts. To everyone’s amazement, Planck not only confirmed WMAP’s findings, it provided such a clear picture of the CMB sky that it left both ESA and NASA scientists with the very difficult task of trying to fit the Planck data in to the standard model of cosmology, the Big Bang. As Paolo Natoli of the University of Ferrara, Italy put it: “The fact that Planck has made such a significant detection of these anomalies erases any doubts about their reality; it can no longer be said that they are artifacts of the measurements. They are real and we have to look for a credible explanation.”[41]



Original ESA image of Planck probe results, March 21, 2013



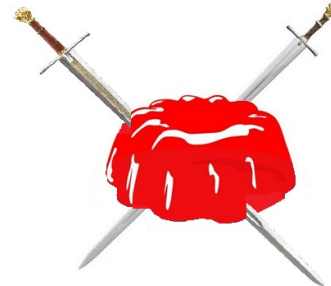
Comparison of Planck and WMAP showing same results of CMB

In the same article, Rundle says: “But the data could prove troubling for some scientists, as it includes ‘large scale anomalies’ which point to a preferred direction of energy fluctuations in the universe – the so called ‘Axis of Evil.’” [42] *New Scientist* said much the same: “Planck’s map greatly improves cosmologists’ understanding of the universe, but it does not solve lingering mysteries over unusual patterns in the CMB. These include a ‘preferred’ direction in the way the temperature of the light varies, dubbed the cosmic ‘axis of evil’....Cosmologists can’t pack up and go home just yet though, as Planck’s map has also confirmed the presence of a mysterious alignment of the universe. The ‘axis of evil’ was identified by Planck’s predecessor, NASA’s Wilkinson Microwave Anisotropy Probe (WMAP)...Planck’s detectors are over 10 times more sensitive and have about 2.5 times the angular resolution of WMAP’s, giving cosmologists a much better look at this alignment. ‘We can be extremely confident that these anomalies are not caused by galactic emissions and not caused by instrumental effects, because our two instruments see very similar features,’ said Efstathiou.” [43]

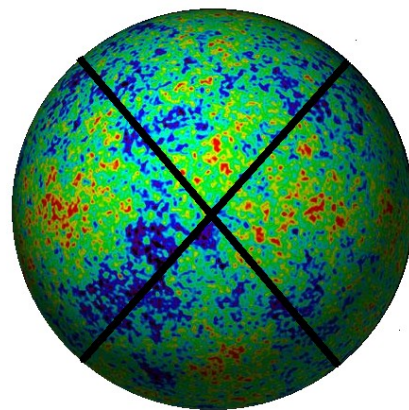
The Planck analysis published in March 2013 by the California Institute of Technology basically says the same thing. In the Overview the abstract states, “Several large scale anomalies in the CMB temperature distribution detected earlier by WMAP are confirmed with higher confidence.” [44] Yet two sentences later it says, “Planck finds no evidence for non-Gaussian statistics of the CMB anisotropies.” Both statements are then modified in Paper XXIII’s abstract with: “Deviations from isotropy have been found and demonstrated to be robust against component separation algorithm, mask and frequency dependence. Many of these anomalies were previously observed in the WMAP data, and are now confirmed at similar levels of significance (around 3σ). However, we find little evidence for non-Gaussianity with the exception of a few statistical signatures that seem to be associated with specific anomalies,” or XXIII’s section 4.1: “However, it is clear that, except on the largest angular scales, there is no evidence for non-Gaussian behaviour in the data using these simple statistical measures.” [45]

So what is its meaning? On the one hand, the Planck team holds, on a statistical basis, that is, based on a Gaussian Distribution Function, [46] that the Planck evidence more or less follows the standard Bell-curve plot, and thus matches up with the LCDM (Big Bang) predictions. On the other hand, Gaussian distribution includes incidences in which data does not fit the Bell-curve, thus exposing anomalies that do not coincide with Big Bang predictions. The real problem with the Planck

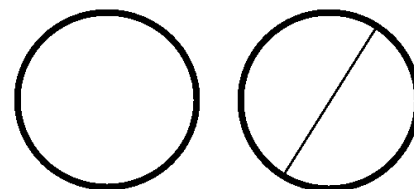
team’s conclusion is that the anomalies are not insignificant. They are more like the proverbial pink elephant in the room. In the end, it matters little how much one can fit the Planck data into the Big Bang, the fact remains that the Big Bang did not predict, and could not predict, the Axis of Evil. This is analogous to a mold of Jell-O (representing the CMB isotropies and homogeneity) with two swords (representing the CMB anisotropies and inhomogeneity) going right through the middle.



Similarly, it is comparable to drawing a big X on the whole universe, in which each of the four ends of the X touch the rim of the universe; and in which the middle of the X, where the two lines intersect, there we find the ecliptic and equinoxes of the Earth, at the very center of the universe.



For NASA and ESA to claim that most of the Planck data matches the Big Bang predictions is like saying that the two pictures below match each other in 99% of their content. It is not the similarities that determine whether they are comparable or contrasting, but the differences. Even with only a 1% difference between the two images, it amounts to a world of difference in their respective meanings.



The Planck team’s casual references to mere “anomalies,” or “deviations from isotropy” or “a few statistical signatures” shows that they are seeking to minimize the differences, but it is precisely these differences that constitute the Axis of Evil. Likewise, it matters little how much of the sky the Planck team determines the Axis occupies, or how much they determine it doesn’t fit on the Bell curve. The mere fact that the Axis exists completely overturns the Copernican Principle and leaves the Big Bang theorists without any explanation whatsoever as to the Axis’ origin.

In the end, the Planck probe data has confirmed that the whole universe is centered around Earth and that the Big Bang inflation theory has been falsified to its core. Few modern cosmologists can accept this death sentence, however. It is for this reason that they will now conjure up all kinds of fanciful explanations. For example, after admitting “the origins of what some cosmologists have called the ‘Axis of Evil’ remains mysterious” and that “the ESA concedes it is no longer possible to dismiss it as some kind of data glitch or trick of the cosmic light,” the latest conjecture is that one of the “blue spots” that helps form the Axis “is the result of another universe colliding with our own,” and concluding that “if our universe really is just one of a myriad filling the Multiverse, then collisions with our neighbors are inevitable. And the result of such collisions would be circular temperature anomalies – similar to the cold spot now seen by Planck.” [47] This is what now passes for “science” in the halls of academia. The Multiverse will now become modern cosmology’s response of choice in order to wiggle out of every piece of evidence that points to a non-Copernican universe.

Endnotes:

- [1] Richard A. Muller, UC Berkeley, “The cosmic background radiation and the new aether drift,” *Scientific American*, vol. 238, May 1978, pp. 64-74, the abstract stating: “U-2 observations have revealed anisotropy in the 3 K blackbody radiation which bathes the universe. The radiation is a few millidegrees hotter in the direction of Leo, and cooler in the direction of Aquarius. The spread around the mean describes a cosine curve. Such observations have far reaching implications for both the history of the early universe and in predictions of its future development.”
- [2] http://en.wikipedia.org/wiki/Cosmic_Background_Explorer.
- [3] http://en.wikipedia.org/wiki/Cosmic_Background_Explorer.
- [4] Brian Greene, “Welcome to the Multiverse,” *The Daily Beast*, May 21, 2012, <http://www.thedailybeast.com/newsweek/2012/05/20/brian-greene-welcome-to-the-multiverse.html>.
- [5] *The Grand Design*, 2010, pp. 129-130.
- [6] Graph taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>
- [7] Charles W. Misner, Kip S. Thorne and John A. Wheeler, *Gravitation*, 1973, pp. 766, 779, in general pages 764-797.
- [8] Jeremy Goodman, “Geocentrism Re-examined,” Princeton University Observatory, Princeton, NJ, June 9, 1995, p. 2. Others have interpreted the anisotropy of the CMB as indicating it is Euclidean (*i.e.* has dimensions), thus allowing a center Paolo de Bernardis, et al., “A flat universe from high-resolution maps of the cosmic microwave background radiation,” *Nature* 404, 955–959, 2000; and V. G. Gurzadyan and S. Torres, “Testing the effect of geodesic mixing with COBE data to reveal the curvature of the universe,” *Astronomy and Astrophysics*. 321:19–23, 1997, which abstract reads: “If the detected eccentricity of anisotropy spots can be attributed to the effect of mixing it implies the negative curvature of the Universe and a value of $\Omega < 1$.”
- [9] Which is still the case since the WMAP 7-year results, which were released in 2011 says that “WMAP now places 50% tighter limits on the standard model of cosmology (Cold Dark Matter and a Cosmological Constant in a flat universe), and there is no compelling sign of deviations from this model” (<http://map.gsfc.nasa.gov/news>) but the reality is that “Cold Dark Matter” has not been found, and the Cosmological Constant is merely a fudge factor to make the Big Bang expansion work as desired.
- [10] This is Tegmark’s recounting of his experience during his interview with Stellar Motion Pictures’ producer Richard Delano in August 2011 for the scientific documentary, *The Principle*.
- [11] <http://news.bbc.co.uk/2/hi/science/nature/2814947.stm>, March 3, 2003.
- [12] Max Tegmark, Angélica de Oliveira-Costa and Andrew J. S. Hamilton, “A high resolution foreground cleaned CMB map from WMAP,” Dept. of Physics and Astronomy, University of Pennsylvania, July 26, 2003, abstract, arXiv:astro-ph/0302496v4.
- [13] Dominik J. Schwarz, Glenn D. Starkman, Dragan Huterer and Craig J. Copi, “Is the Low- l Microwave Background Cosmic?” *Physical Review Letters*, November 26, 2004, pp. 221301-1 to 4. The same phenomenon is reiterated in their 2005 paper, “On large scale anomalies of the microwave sky,” *Monthly Notices of the Royal Astronomical Society*; and their 2010 paper, “Large-angle anomalies in the CMB,” and begin it with an obvious reaffirmation that all data will be interpreted through the grid of the “Copernican Principle...that the Earth does not occupy a special place in the universe...” (p. 1), but at the same time admit: “These apparent correlations with the solar system geometry are puzzling and currently unexplained...the quadrupole and octopole are orthogonal to the ecliptic at the 95.9% CL [confidence level]...a systematic that is indeed correlated with the ecliptic plane...the normals to these four planes are aligned with the direction of the cosmological dipole (and with the equinoxes) at a level inconsistent with Gaussian random, statistically isotropic skies at 99% CL” (p. 5).
- [14] “Large-angle anomalies in the CMB,” Craig J. Copi, D. Huterer, D. Schwarz, and G. Starkman, Nov. 12, 2010, arXiv:1004.5602v2. A Wikipedia article tries to pin the anomalies on foreground contamination: “Later analyses have pointed out that these are the modes most susceptible to foreground contamination from synchrotron, dust, and free-free emission, and from experimental uncertainty in the monopole and dipole. A full Bayesian analysis of the WMAP power spectrum demonstrates that the quadrupole prediction of Lambda-CDM cosmology is consistent with the data at the 10% level and that the observed octopole is not remarkable. Carefully accounting for the procedure used to remove the foregrounds from the full sky map further reduces the significance of the alignment by ~5%” (http://en.wikipedia.org/wiki/Cosmic_microwave_background_radiation). This still leaves the fact that the Big Bang model is only consistent with CMB anisotropy by, at most, 15%, which leaves 85% non-consistent. This is nothing to brag about, especially since it would require the Big Bang model to be based on nothing more than foreground contaminated evidence. Moreover, the Wikipedia sources for foreground contamination (footnotes 71-75) are old, ranging from 2004 to 2006. Since then, foreground contamination has been ruled out, as noted in Copi’s *et al.*, 2010 paper. As for percentages, Copi shows they are worse than 85% for the Big Bang: “The study of alignments in the low- l CMB has found a number of peculiarities. We have shown that the alignment of the quadrupole and octopole planes is inconsistent with Gaussian, statistically isotropic skies at least at the 99% confidence level. Further a number of (possibly related) alignments occur at 95% confidence levels or greater” (*ibid.*, p. 6). Hence, Copi’s 2010 paper answers the 2005 paper by Chris Vale titled, “Local Pancake Defeats Axis of Evil,” who claims the Axis is the result of “weak lensing of the CMB dipole by large magnitude.” See also “Significant Foreground Unrelated Non-Acoustic Anisotropy on the 1 Degree Scale in WMAP Probe 5-Year Observations,” Bi-Zhu Jiang, et al., Jan. 2010.
- [15] “The Oddly Quiet Universe: How the CMB Challenges Cosmology’s Standard Model,” Glenn D. Starkman, Craig J. Copi, Dragan Huterer, Dominik Schwarz, January 12, 2012, arXiv:1201.2459v1.
- [16] Graphs taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>
- [17] Glenn Starkman and Dominik Schwarz, “Is the Universe Out of Tune,” *Scientific American*, August 2005, p. 50.
- [18] *Ibid.*, p. 55.
- [19] *Ibid.*, p. 52.
- [20] Graph taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>
- [21] “Axis of Evil Warps Cosmic Background,” Marcus Chown, *New Scientist*, October 22, 2005, pp. 19ff, emphasis in original.
- [22] Graph taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>
- [23] Kate Land and João Magueijo, “The axis of evil,” Theoretical Physics Group, Imperial College, London, Feb. 11, 2005, p. 1.
- [24] “Did the big bang really happen,” M. Chown, *New Scientist*, July 2, 2005, p. 6.
- [25] *Ibid.*, pp. 1-3. Chown adds: “Last year they wrote an open letter warning that failure to fund research into big bang alternatives was suppressing free debate in the field of cosmology (*New Scientist*, 22 May 2004, p 20).”
- [26] Graph taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>
- [27] http://en.wikipedia.org/wiki/Cosmic_microwave_background_radiation. Another source has the Earth moving toward Virgo: “After the dipole anisotropy, which is due to the Doppler shift of the microwave background radiation due to our peculiar velocity relative to the co-moving cosmic rest frame, has been subtracted out. This feature is consistent with the Earth moving at some 627 km/s towards the constellation Virgo” (http://en.wikipedia.org/wiki/CMB_cold_spot). The discrepancy of using Virgo as opposed to Leo is that the two constellations are next to each other in the Zodiac, and the dipole axis is between them, although closer to Leo. The 371km/s is the net speed of the sun minus any galactic movement toward Leo.
- [28] Image from Cal Tech lecture on the CMB at <http://ned.ipac.caltech.edu/level5/Sept02/Kinney/Kinney3.html>.
- [29] John P. Ralston, “Question Isotropy,” Dept. of Physics and Astronomy, Univ. of Kansas, Nov. 2010, pp. 4-5. Ralston adds: “All are again *well-aligned with the axis of Virgo*. A subsequent study in 2008 diluted by higher values of l does not change this conclusion. And so if there is a local effect or bias producing the (many) alignments, it affects much of the actual power in the

CMB, which then would not be ‘pristine’ and concluding with “*our studies find there is nothing supporting isotropy of the CMB, and everything about the data contradicting it.*”

[30] Graph taken from Kate Land’s seminar at: <http://www.cita.utoronto.ca/TALKS/Land-Nov23.pdf>

[31] Ralston, “Question Isotropy,” p. 5. Ralston may have made the same point when he says, “However the alignment of the quadrupole and octupole happens to be right along the dipole, and point along Virgo. Some use this as a reason to dismiss the quadrupole and octupole, while retaining the rest of the CMB as ‘pristine,’” but he made a mistake in saying that the quadrupole/octupole “point along Virgo” (since it is obvious that the quad- and octupole axis is perpendicular to the dipole axis).

[32] “The Energy of Empty Space is not Zero. http://www.edge.org/3rd_culture/krauss06/krauss06.2_index.html

[33] Dragan Huterer, *Astronomy*, Dec. 2007, pp. 38-43.

[34] *Ibid.*, p. 43. See also *Scientific American*, December 9, 2011 article titled “Universal Alignment: Could the Cosmos Have a Point” by Michael Moyer, which makes reference to Huterer’s findings, stating: “The universe has no center and no edge, no special regions ticked in among the galaxies and light. No matter where you look, it’s the same – or so physicists thought...hot and cold spots speckle the sky....Cosmologists have called it the ‘axis of evil.’” Likewise, Federico Urban and Ariel Zhitnitsky state “Similarly, one can employ different vectorial and tensorial decompositions of the multipoles to see that there is a very easily identifiable preferred axis, the cosmological dipole once again; that is, the normal vectors to the planes determined by the quadrupole and the octupole (there are four of them) point all in the same direction, that of the ecliptic and equinox” “The P-Odd Universe,” University of British Columbia, July 13, 2011, p. 2.

[35] Lawrence Vescera, Nov. 9, 2007, <http://www.idscience.org/2007/11/09/the-discovery-that-dare-not-speak-its-name/>

[36] Dan Falk, *Astronomy Magazine*, Dec. 8, 2004, p. 1-2.

[37] Dan Falk, “Cosmic oddity casts doubt on theory of universe,” *The Globe and Mail*, Jan. 29, 2005, updated Mar. 17, 2009.

[38] A recent study Chilean astronomers confirms its absence. They write: “The amount of mass that we derive matches very well with what we see – stars, dust and gas – in the region around the sun, but this leaves no room for the extra material – dark matter – that we were expecting. Our calculations show that it should have shown up very clearly in our measurements. But it was just not there!” (“Serious Blow to Dark Matter Theories?,” *ScienceDaily*, April 18, 2012).

[39] *Ibid.*

[40] Dan Falk quoting Craig Hogan of the University of Washington in Seattle, *Astronomy Magazine*, December 8, 2004, p. 1-2.

[41] Michael Rundle, “ESA’s Planck Satellite Reveals Most Precise Image Ever Made of the Primordial Universe,” *Huffington Post*, March 21, 2013.

[42] *Ibid.*

[43] Jacob Aron, “Planck shows almost perfect cosmos – plus axis of evil,” March 21, 2013.

[44] http://planck.caltech.edu/pub/2013results/Planck_2013_results_01.pdf

[45] http://planck.caltech.edu/pub/2013results/Planck_2013_results_23.pdf

[46] http://en.wikipedia.org/wiki/Gaussian_function

[47] “Ripples from another dimension,” *TheNational*, Robert Matthews, April 7, 2013; www.thenational.ae/news/uae-news/ripples-from-another-dimension.

