

Cosmological Evidence Shows Central and Non-Moving Earth

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Using the simplest interpretation of the current cosmological evidence concerning galactic redshift; the anisotropy of the CMB; gamma-ray and X-ray bursts; and quasar distribution, as provided by the 2005 Sloan Digital Sky Survey; the 2001 Wilkinson Microwave Anisotropy Probe and other such studies, show that the Earth is at or very near the center of the universe and that alternative interpretations advancing homogeneity and the LCDM universe (e.g., "the center is everywhere and nowhere due to an expanding universe") are contradicted by the di-quad- and octu-pole outcomes of the CMB; the large void area at the observation point; and the consistent concentric and quantized z -factor of the redshift around the observation point. Further evidence from the Michelson-Morley and Sagnac-type experiments from 1881 through 1932, as well as post-1932 maser and laser interferometry, including the Sagnac-based pre-programming for the Global Positioning Satellites, show that some type of ponderable ether exists, which is in principle agreement with Quantum Mechanics but opposed to Special Relativity. It is postulated that interpretations of the historic interferometer experiments that were said to yield a "null" result were simply the result of presuming, without proof, that the Earth was translating at 30km/sec around the sun, which leads to the conclusion that Special Relativity was invented precisely to avoid having to answer the Michelson-Morley experiment by admitting to a motionless Earth. In actuality, none of the interferometer experiments showed a "null" result, and as such they give convincing evidence of an ether drift that can be easily accounted for within the margin of an ether-universe rotating around a non-rotating and non-translating Earth.

1. Introduction

Evidence for a centrally located and non-moving earth, which requires that the universe itself rotates around a fixed earth, has gained substantial evidence in the past century or so. The fixed earth was known from the ostensible evidence gathered from the **George Airy** telescopes and the **Michelson-Morley** interferometer experiments but rejected by modern science in favor of Special Relativity over one hundred years ago. Evidence for a centrally located earth has been known since the time of Hubble, and increased in the 1970s with **Tifft**, **Guthrie**, **Napier**, **Burbridge**, **Kook**, and **Krone's** studies of periodic distribution of red shifts in the 36km/sec range (e.g., "Evidence for Quantized and Variable Redshifts in the Cosmic Background Rest Frame," W. G. Tifft, Steward Observatory, 1996); followed by subsequent red shift studies showing earth at or very near the center of the distribution (John G. Hartnett & Koichi Hirano, *Astrophysics and Space Science* **318**: 13, 2008). Evidence has reached critical mass with the results of the 2001 WMAP and 2005 SDSS.

2. The Centrally Located Earth

Edwin Hubble was the first to see the centrally located earth. In his 1937 book **The Observational Approach to Cosmology**, he expresses his deepest concerns about the fact that the red shift of galaxies was isotropic in whatever direction of the sky he looked, concluding: "...Such a condition would imply that we occupy a unique position in the universe, analogous, in a sense, to the ancient conception of a central Earth... This hypothesis cannot be disproved, but it is unwelcome and would only be accepted as a

last resort in order to save the phenomena. Therefore we disregard this possibility... the unwelcome position of a favored location must be avoided at all costs... such a favored position is intolerable... Therefore, in order to restore homogeneity, and to escape the horror of a unique position... must be compensated by spatial curvature. There seems to be no other escape." [1]

Modern cosmology has tried to explain this phenomenon using the **Friedmann-Lemaitre-Robertson-Walker** (FLRW) model of Einstein's "spatial curvature" equations $G_{\mu\nu} = 8\pi T_{\mu\nu}$ to produce a non-Euclidean universe that is expanding as if on the surface of a balloon. As such, all the galaxies will appear to expand away from each other so that no single point could be designated the center of the expansion. But as **Stephen Hawking** has admitted, the FLRW model has no evidence in its favor; rather, cosmologists choose it merely to preserve the Copernican principle. He writes: "...the universe might look the same in every direction as seen from any other galaxy, too. This, as we have seen, was Friedmann's second assumption. We have no scientific evidence for, or against, this assumption. We believe it only on grounds of modesty." [2] His co-author in another book, George F. R. Ellis admits much the same: "This assumption is made because it is believed to be unreasonable that we should be near the center of the Universe." [3] Hawking admits that the evidence could just as well point to a central earth: "...all this evidence that the universe looks the same whichever direction we look in might seem to suggest there is something special about our place in the universe. In particular, it might seem that if we observe all other galaxies to be moving away from us, then we must be at the center of the universe."

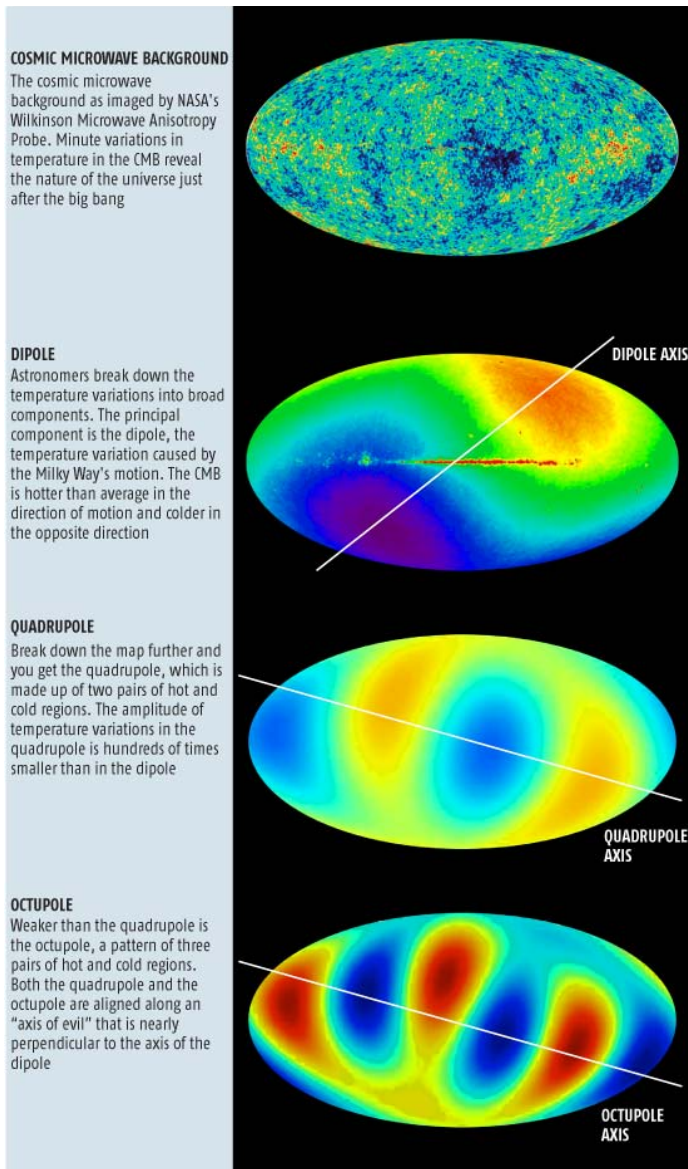


Fig. 1. Axis of Evil

Regarding the "Friedman" option, a recent paper by **Yukio Tomozawa** asserts it is no longer an option: "In the Friedman universe, one possible interpretation of the coordinates is that the whole space is on the surface of an expanding balloon and has no center... [But] in such a universe, there is no cosmic microwave background (CMB) dipole, even in the presence of a peculiar velocity. In other words, the observation of a CMB dipole excludes such an interpretation of the coordinates for the Friedman universe." [4] In another paper, Tomozawa writes: "The validity of Hubble's law defies the determination of the center of the big bang expansion, even if it exists. Every point in the expanding universe looks like the center from which the rest of the universe flies away. In this article, the author shows that the distribution of apparently circular galaxies is not uniform in the sky and that there exists a special direction in the universe in our neighborhood. The data is consistent with the assumption that the tidal force due to the mass distribution around the universe center causes the deformation of galactic shapes depending on its orientation and location relative to the center and our galaxy." [5] Although Tomozawa's center of the universe is about 22.8 Mpc

from Earth, it is within 99.97% of Earth in the exact center of the universe when compared to the modern consensus for the size of the universe of 93 billion light years in diameter.

George F. R. Ellis recently added that the Copernican bias that currently reigns in cosmology is not true and unbiased science: "Additionally, we must take seriously the idea that the acceleration apparently indicated by supernova data could be due to large scale inhomogeneity with no dark energy. Observational tests of the latter possibility are as important as pursuing the dark energy (exotic physics) option in a homogeneous universe. Theoretical prejudices as to the universe's geometry, and our place in it, must bow to such observational tests. Precisely because of the foundational nature of the Copernican Principle for standard cosmology, we need to fully check this foundation. And one must emphasize here that standard CMB anisotropy studies do not prove the Copernican principle: they assume it at the start." [6] Ellis has had a long history of promoting the geocentric universe. He had once shaken the halls of modern science with what other scientists said was "an earthquake that made Copernicus turn in his grave." In a lengthy article in *New Scientist* in 1978, Ellis' own General Relativity theory forced him to conclude that our galaxy is located near one of "two centers" in the universe that are in an antipodal relation [7]. Although Ellis allows that his observations and calculations may be the result of a wrong interpretation, no one has since discovered any such errors, including Ellis. In fact, the then editor of *Nature*, **Paul C. W. Davies**, admitted that Ellis' theory did not contain any logical errors and that in every aspect seems to be in agreement with observed facts. Under the article title "Cosmic Heresy," Davies writes: "Often the simplest of observations will have the most profound consequences. It has long been a cornerstone of modern science, to say nothing of man's cosmic outlook, that the Earth attends a modest star that shines in an undistinguished part of a run-of-the-mill galaxy. Life arose spontaneously and man evolved on this miscellaneous clump of matter and now directs his own destiny without outside help. This cosmic model is supported by the Big-Bang and Expanding Universe concepts, which in turn are buttressed by the simple observation that astronomers see redshifts wherever they look. These redshifts are due, of course, to matter flying away from us under the impetus of the Big Bang. But redshifts can also arise from the gravitational attraction of mass. If the Earth were at the center of the universe, the attraction of the surrounding mass of stars would also produce redshifts wherever we looked! The argument advanced by George Ellis in this article is more complex than this, but his basic thrust is to put man back into a favored position in the cosmos. His new theory seems quite consistent with our astronomical observations, even though it clashes with the thought that we are godless and making it on our own." [8]

Similarly, **Craig Copi**, *et al*, have stated: "The cosmological model we arrive at is baroque, requiring the introduction at different scales and epochs of three sources of energy density that are only detected gravitationally - dark matter, dark energy and the inflation... At the very least, probes of the large-angle (low- ℓ) properties of the CMB reveal that we do not live in a typical realization of the concordance model of inflationary LCDM." [9] Interestingly enough, in regards to the anisotropy of the CMB, recent studies show that the dipole, quadrupole and octupole

heat distribution of the CMB aligns precisely with our ecliptic and equinoxes, a truly fascinating and heretofore unknown phenomenon. (See diagram below in which the dipole lines up with our equinoxes and the quadrupole and octupole line up with our ecliptic). If the CMB were the residual energy after a Big Bang, then the orientations of the heat distribution would be random, but it is obviously anything but random. So shocking are these results that cosmologists have dubbed it “**The Axis of Evil**” since it neutralizes the Copernican and cosmological principles upon which the LCDM (lambda plus cold dark matter) universe or Big Bang rests.

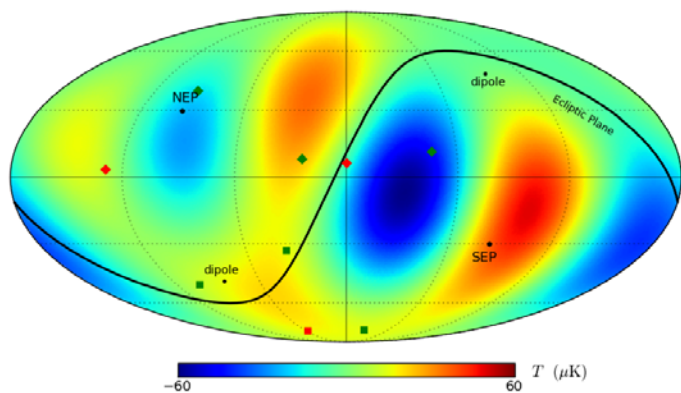


Fig. 2. Quadrupole and octupole ($\ell = 2$ and 3) temperature anisotropy of the WMAP sky map in galactic coordinates, shown with the ecliptic plane and the cosmological dipole. Included are the multipole vectors (solid diamonds); two for the quadrupole (red diamonds) and three for the octupole (green diamonds). We also show the four normals (solid squares) to the planes defined by vectors that describe the quadrupole and octupole temperatures anisotropy; one normal is defined by the quadrupole (red square) and three by the octupole (green squares). Note that three out of four normals lie very close to the dipole direction. The probability of this alignment being accidental is about one in a thousand. Moreover, the ecliptic plane traces out a locus of zero of the combined quadrupole and octupole over a broad swath of the sky – neatly separating a hot spot in the northern sky from a cold spot in the south. These apparent correlations with the solar system geometry are puzzling and currently unexplained.

Lawrence Krauss of Arizona State University has been very candid about the implications of these studies: “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.” [10] That there may be any kind of statistical fluke or foreground contamination producing these shocking results has been discounted on the order of 99.9% [11]. When Krauss commented in

USA Today on a paper written by **Temple & Smoller** that demonstrate equations that make dark energy superfluous, he concluded that the only way the equations could work is if earth is “literally at the center of the universe, which is to say the least, unusual.” [12]

In a recent publication, the team of **Dominik Schwarz, Glenn Starkman, et al.**, discovered that: “The large-angle correlations of the cosmic microwave background exhibit several statistically significant anomalies compared to the standard inflationary cosmology... the quadrupole-octupole correlation is excluded from being a chance occurrence in a gaussian random statistically isotropic sky at $> 99.87\%$... The correlation of the normals 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 related article in *Scientific American*, **Schwarz and Starkman** essentially say the same thing, but with a few more details. Comparing the CMB fluctuations 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.” [14] 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.” Schwarz and Starkman then refer to the study of **Tegmark and Oliveira-Costa** noting that the “preferred axes of the quadrupole modes...and the octupole modes... were remarkably closely aligned” 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.” Max Tegmark, head of the 2001 WMAP team, stated the findings rather bluntly: “Our entire observable universe is inside this sphere of radius 13.3 billion light-years, with us at the center,” [15] and provided Fig. 3. In a recent email to a colleague of mine, Tegmark was asked if the CMB map he provided could be used to illustrate a geocentric universe. Tegmark replied: “I don’t think they don’t point toward a geocentric universe,” offering a paper he wrote with his wife Angélica de Oliveira-Costa as evidence for the possibility of geocentrism <http://arxiv.org/abs/astro-ph/0307282> (email, dated May 2, 2011, on file with me).

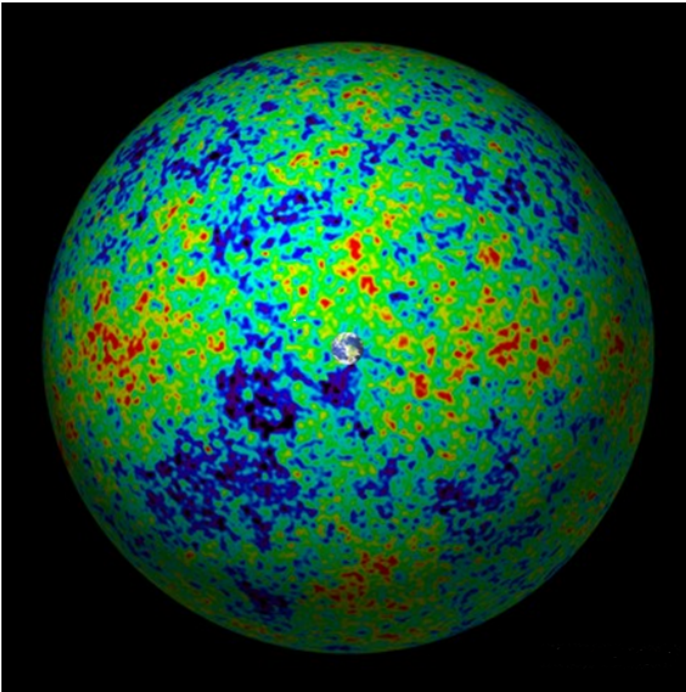


Fig. 3. Universe's CMB Aligned with Earth at Center

Tegmark continues: "Space continues outside the sphere but this opaque glowing wall of hydrogen plasma hides it from our view. If we could only see another 380,000 light-years we would be able to see the beginning of the Universe....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. 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. 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." [16] A viable explanation of this data is that the low multipoles for $\ell < 4$ is that the universe is finite and no bigger than the CMB sky. Additionally, the CMB's physical alignment of the quadrupole and octupole with our ecliptic; and the physical alignment of the dipole axis (which is orthogonal to the quadrupole and octupole) with our equinoxes, means the Earth must be at or very near the center of the CMB, otherwise we would not be able to see these alignments. It is as if our particular locale has been imprinted on the CMB; as if the CMB originated from us. Standard cosmology, however, seeks an alternative that has the dipole formed by the movement of the solar system through a fixed CMB, which then makes the dipole insignificant and thus ignored.

Joseph Silk of the University of California (Berkeley) says: "Studies of the cosmic background radiation have confirmed the isotropy of the radiation, or its complete uniformity in all directions. If the universe possesses a center, we must be very close to it... otherwise, excessive observable anisotropy in the radiation

would be produced, and we would detect more radiation from one direction than from the opposite direction." [17] If we follow these results to their logical conclusion, then we must admit that the CMB is aligned with our ecliptic and equinoxes, which means that the Earth is in the virtual center of the universe and also that cold dark matter is obsolete. Timothy Clifton of Oxford puts it thus: "A fundamental presupposition of modern cosmology is the Copernican Principle, that we are not in a central, or otherwise special region of the Universe. Studies of Type Ia supernovae, together with the Copernican principle, have led to the inference that the Universe is accelerating in its expansion. The usual explanation for this is that there must exist a 'Dark Energy,' to drive the acceleration. Alternatively, it could be the case that the Copernican Principle is invalid, and that the data has been interpreted within an inappropriate theoretical framework. If we were to live in a special place in the Universe, near the centre of a void where the local matter density is low, then the supernovae observations would be accounted for without the addition of dark energy." [18]

3. Quantized Galaxy Distribution around the Void

Expanding on the work of Tifft, *et al*, regarding periodicities in red shift values, recent papers by John Hartnett and Koichi Hirano have shown that the periodicities are anchored around a void area having earth at or near the center of the void.

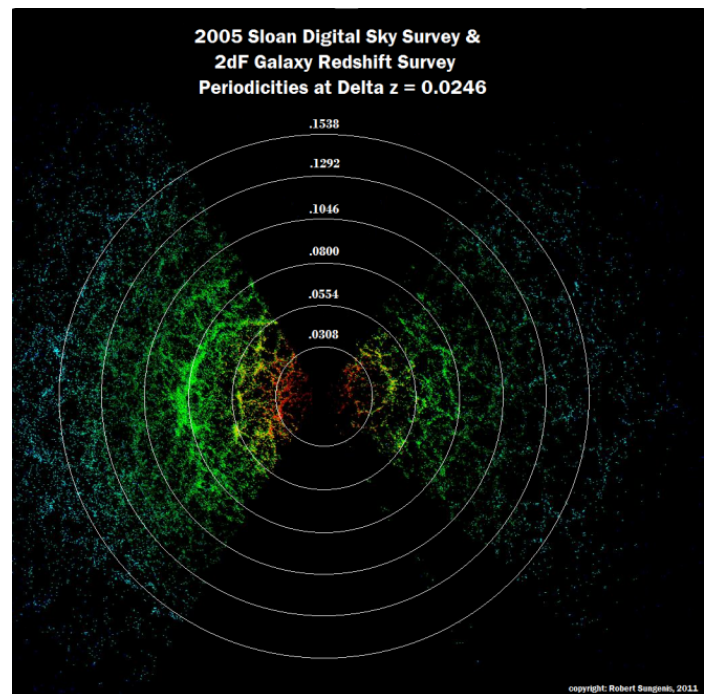


Fig. 4. Galaxy Distribution Showing Earth in Center of the Void

The void area is approximately 60Mpc in diameter and is the only known under density of galaxy population in the observable universe. Hartnett has shown from the Sloan Digital Sky Survey (SDSS) and the 2dF Galaxy Redshift Survey that galaxies are situated in concentric circles around the void area. Hartnett's analysis shows that the center point for the concentric alignment is 26Mpc from earth, which in terms of the estimated size of the universe, puts the Earth within 97.98% of the exact center.[19] In

another paper, Hirano refers to the above evidence and describes it as devastating to the Copernican principle: "A widespread idea in cosmology is that the universe is homogeneous and isotropic above a certain scale. This hypothesis, usually called the cosmological principle is thought to be a generalization of the Copernican principle that 'the Earth is not in a central, specially favored position' [reference to P. J. E. Peebles, **Principles of Physical Cosmology**, 1993]. The assumption is that any observer at any place at the same epoch would see essentially the same picture of the large scale distribution of galaxies in the universe. However, according to a Fourier analysis by Hartnett and Hirano, the galaxy number count N from redshift z data indicates that galaxies have preferred periodic redshift spacings of $\Delta z = 0.0102, 0.0246, 0.0448$ in the Sloan Digital Sky Survey with similar results from the 2dF Galaxy Redshift Survey..." [20]

4. Periodic Distribution of Quasars

As early as 1975, right around the same time Tifft, *et al*, were finding periodicities in galaxy redshift, **Y. P. Varshni** was finding the same with quasar distribution. In 1975 he catalogued 384 quasars between redshift of 0.2 and 3.53 and found that they were formed in 57 separate groupings of concentric spheres around the Earth. He made the following startling conclusion: "the quasars in the 57 groups...are arranged on 57 spherical shells with the Earth as the center....The cosmological interpretation of the redshift in the spectra of quasars leads to yet another paradoxical result: namely, that the Earth is the center of the universe." Varshni first based his calculations on the spectra of the quasars and then did a second test on their actual redshifts.

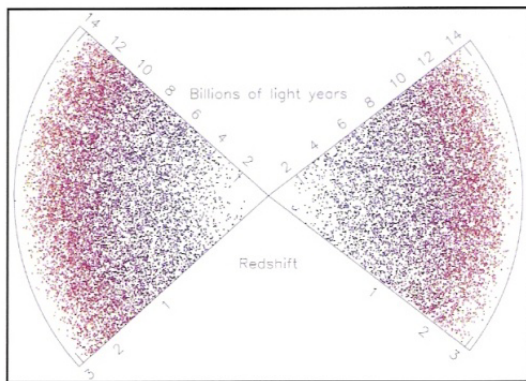


Fig. 5. Quasars. The density of quasars increases outwards from the Earth. In this plot (which has empty quadrants where quasars are hard to find among the stars of the Milky Way) the Earth is at the center, in the nearly blank area. The density of quasars decreases after about 11 billion l.y. into the 'dark ages' before they had formed.

Both tests produced the same results. Varshni concludes that if his analysis is correct for quasars, then... "The Earth is indeed the center of the Universe. The arrangement of quasars on certain spherical shells is only with respect to the Earth. These shells would disappear if viewed from another galaxy or quasar. This means that the cosmological principle will have to go. Also it implies that a coordinate system fixed to the Earth will be a preferred frame of reference in the Universe. Consequently, both the Special and General Theory of Relativity must be abandoned for

cosmological purposes." [21] Varshni calculated the odds against such an arrangement and found: "From the multiplicative law...the probability of these 57 sets of coincidences occurring in this system of 384 QSOs is $\approx 3 \times 10^{-85}$. We hope this number will be convincing evidence that the coincidences are real and cannot be attributed to chance." Since Varshni's pioneering efforts, more targeted studies have been done on quasars with close to the same results. Varshni found the same "void area" at the center that current SDSS finds for galaxies. Recent studies from the SDSS DR6 release show that Varshni's original findings have been confirmed. John Hartnett writes: "Fourier spectral analysis... finds that there are preferred redshifts separated by intervals of $\Delta z = 0.258, 0.312, 0.44, 0.63$ and 1.1 ," although Hartnett, siding with Arp, cautions that there may be some "unknown selection effect" simulating the periodicity. [22] Likewise, Bell and Comeau have also commented on selection effects. [23] In an earlier paper, Bell and McDiarmid analyzed 46,000 SDSS quasar redshifts and found a "distinct power peak" of which "the locations of the peaks in the redshift distribution are in agreement with the preferred redshifts predicted by the intrinsic redshift equation....We conclude that it is real..." [24] In the end, Varshni's original findings have not been overturned.

5. Periodicities in Gamma Ray Bursts

The recent book, **The Biggest Bangs: The Mystery of Gamma-Ray Bursts, the Most Violent Explosions in the Universe**, written by astrophysicist **Jonathan Katz** of Washington University, includes a chapter titled "The Copernican Dilemma." Katz's studies have found that, when all the known gamma-ray bursts are calculated and catalogued, they show Earth to be in the center of it all. He writes: "The uniform distribution of burst arrival directions tells us that the distribution of gamma-ray-burst sources in space is a sphere or spherical shell, with us at the center (some other extremely contrived and implausible distributions are also possible). But Copernicus taught us that we are not in a special preferred position in the universe; Earth is not at the center of the solar system, the Sun is not at the center of the galaxy, and so forth. There is no reason to believe we are at the center of the distribution of gamma-ray bursts. If our instruments are sensitive enough to detect bursts at the edge of the spatial distribution, then they should not be isotropic on the sky, contrary to observation; if our instruments are less sensitive, then the $N \propto S^{-3/2}$ law should hold, also contrary to observation. That is the Copernican dilemma. To this day, after the detection of several thousand bursts, and despite earnest efforts to show the contrary, no deviation from a uniform random distribution (isotropy) in the directions of gamma-ray bursts on the sky has ever been convincingly demonstrated." [25] A recent article in *Sky and Telescope* supports this interpretation: "'There's this myth that gamma-ray bursts are chaotic and unpredictable...but that's not true.' In fact GRB's might even be used as 'standard candles' with which to measure cosmic distances." [26] In a paper by **Yana Tikhomirova, et al**, in which the sample consists of 3906 GRBs which includes non-triggered bursts with peak fluxes down to $0.1 \text{ photons cm}^{-2} \text{ s}^{-1}$, the authors state they "find no significant deviations from isotropy," [27] which means that Katz's results were confirmed.

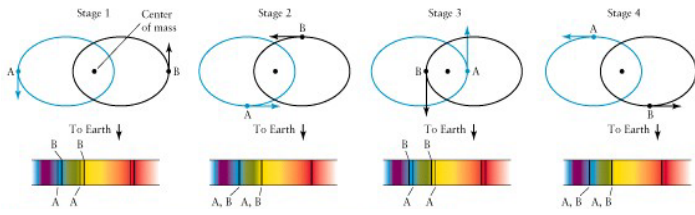


Fig. 6. Varying Spectrums of Binary Stars

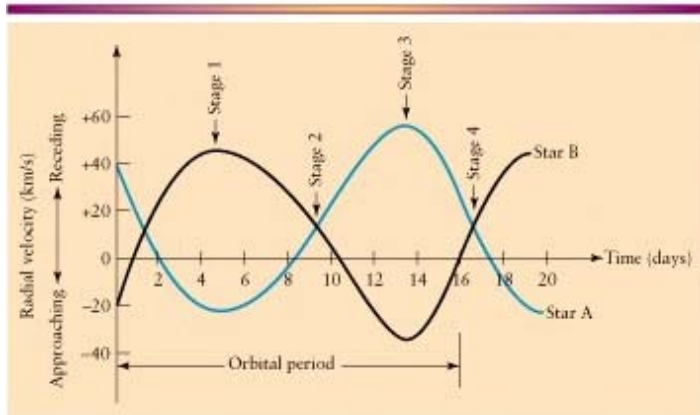


Fig. 7. Orbital Period of Binary Stars

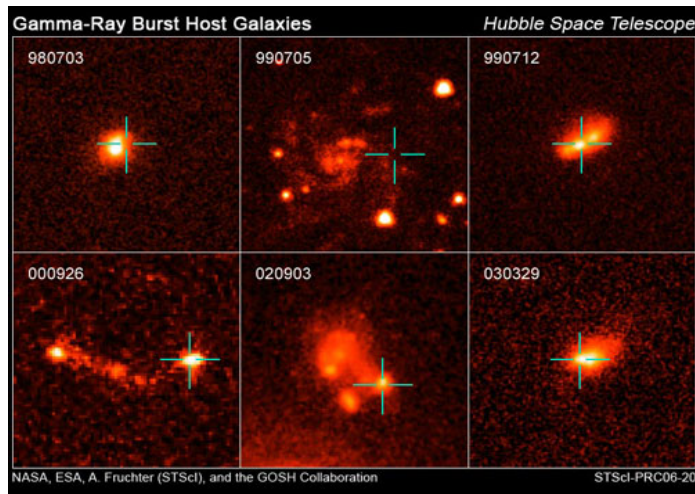


Fig. 8. Typical Gamma Ray Burster Activity

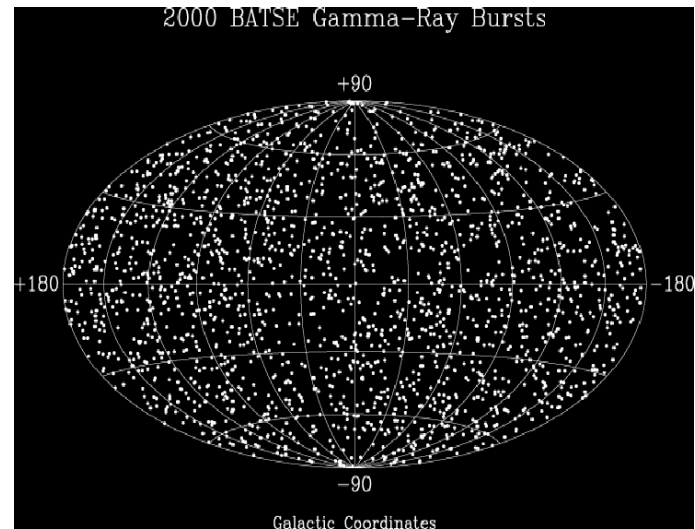


Fig. 9. Isotropic Distribution of GRB's Around Earth

6. Spectroscopic Binaries

The earth-centered periodicities have also been found with spectroscopic binaries. The orbital axes of binaries are situated with respect to the Earth. Since binary stars are seen over the 360 degrees of visual space, this means that the axis of each binary system is pointing toward the Earth as if the Earth were the center of a giant merry-go-round and the axes were arrows. Without admitting to any possibility that the binaries show Earth is in the center of the universe, astronomers instead prefer to attach innocuous names to such phenomena, this particular one being called the "Barr effect," after the astronomer J. M. Barr. Barr's original study found that of the 30 spectroscopic binaries he analyzed, 26 had longitudes of periastron between 0 and 180 degrees, which means that they were oriented toward Earth as their center.

7. Globular Clusters

Lastly, we have evidence from globular clusters, which are conglomerations of thousands of loosely fitting stars. They form a spherical distribution around our nearest stars, and effectively, around the Earth. Dewey Larson writes: "The distribution of [globular] clusters around the Galaxy is nearly spherical, and there is no evidence that the cluster system participates to any substantial degree in galactic rotation....We see the globular clusters as a roughly spherical halo....The cluster concentration gradually decreases until it reaches the cluster density of intergalactic space." [28] Astronomers Victor Clube and William Napier found the same evidence, showing that globular clusters, while being independent of the galaxy in that they do not participate in the rotation of the same, show a radial dispersion from the center of the galaxy and conclude that "It is extremely difficult to explain these observations by any other kind of model." [29]

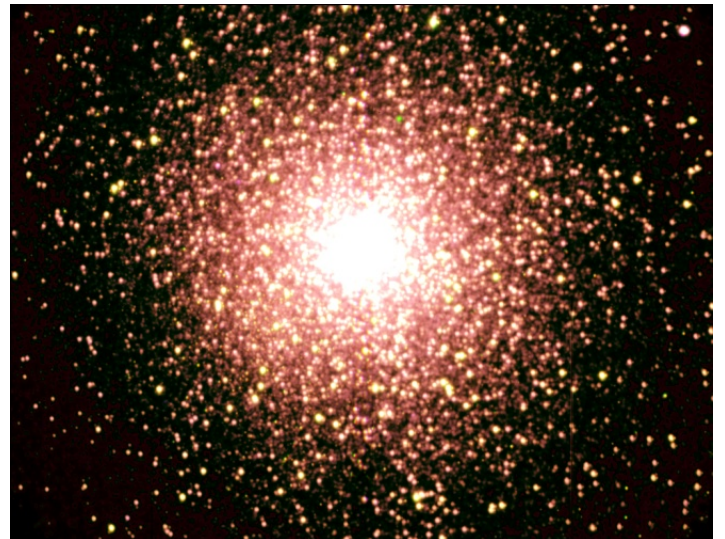


Fig. 10. Typical Globular Cluster of Stars

8. The Motionless Earth

Ultimately, the one man to whom we can point who is behind all the attempts to preserve the Copernican and cosmological principles is Albert Einstein. Similar to Edwin Hubble who stated that an Earth-centered cosmos would be "intolerable" and "must be avoided at all costs," so Einstein gave birth to Relativity

for precisely the same reason, only his biographer chose the word “unthinkable.” After the famous Michelson-Morley experiment (MMX) of 1887, Ronald W. Clark describes what came next: “The problem which now faced science was considerable. For there seemed to be only three alternatives. The first was that the Earth was standing still, which meant scuttling the whole Copernican theory and was unthinkable. The second was that the ether was carried along by the earth in its passage through space...The third solution was that the ether simply did not exist, which to many nineteenth century scientists was equivalent to scrapping current views of light, electricity, and magnetism, and starting again.” [30]

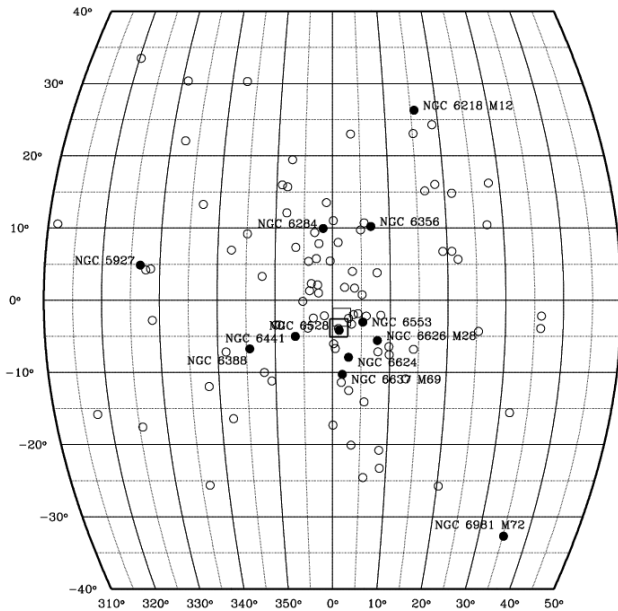


Fig. 11. Non-Random Distribution of Globular Clusters

The reason for these ultimatums was that the MMX didn't measure an ether drift commensurate with an Earth revolving around the sun at 30kms; so one logical solution was that the Earth wasn't moving. That a non-moving Earth was a viable consideration is noted in the comments from the top physicists of that day, including Michelson. Einstein: “I have come to believe that the motion of the Earth cannot be detected by any optical experiment.” [31] Lorentz: “Briefly, everything occurs as if the Earth were at rest...” [32] Eddington: “There was just one alternative; the earth's true velocity through space might happen to have been nil” [33] Pauli: “The failure of the many attempts to measure terrestrially any effects of the earth's motion...” [34] Poincare: “We do not have and cannot have any means of discovering whether or not we are carried along in a uniform motion of translation.” [35] “A great deal of research has been carried out concerning the influence of the Earth's movement. The results were always negative” [36] Michelson: “This conclusion directly contradicts the explanation of the phenomenon of aberration which has been hitherto generally accepted, and which presupposes that the Earth moves.” [37] Jaffe: “The data were almost unbelievable... There was only one other possible conclusion to draw – that the Earth was at rest” [38]; Adolf Baker: “Always the speed of light was precisely the same... Thus, failure [of Michelson-Morley] to observe different speeds of light at different times of the year suggested that the Earth must be ‘at rest’... It was

therefore the ‘preferred’ frame for measuring absolute motion in space. Yet we have known since Galileo that the Earth is not the center of the universe. Why should it be at rest in space?” [39] Barnett: “...nor has any physical experiment ever proved that the Earth actually is in motion.” [40] Lorentz had proposed that the instruments used to measure the ether drift shrunk when moving with the Earth through the ether, thus making it appear as if the Earth wasn't moving. Einstein came up with the “third solution” and posited that ether doesn't exist. If the ether is eliminated, then the results of the MMX could be explained by saying that time changes (or warps) when an object (such as the Earth) moves in space. Both Lorentz and Einstein used the factor $\sqrt{1 - v^2/c^2}$ to account for shrinking or warping, respectively, which then led Einstein to the whole concept of “space-time” and the rudiments of Special Relativity theory.

9. Michelson-Morley Measured Ether Drift

Since Einstein chose as his foundation that the Earth was translating around the sun at 30kms and thus postulated the ether did not exist, the results of MMX were considered “null” and all subsequent theorizing, including Special and General Relativity, was built on the assumption that the Earth was moving. Thus, Einstein could safely develop his Special Relativity theory with the accepted premise that space was a vacuum that did not possess any ponderable substance (i.e., ether). That Relativity theory was the direct result of MMX was admitted by Einstein in a speech honoring Michelson: “I have come among men who for many years have been true comrades with me in my labors. You, my honored Dr. Michelson, began with this work when I was only a little youngster, hardly three feet high. It was you who led the physicists into new paths, and through your marvelous experimental work paved the way for the development of the Theory of Relativity. You uncovered an insidious defect in the ether theory of light, as it then existed, and stimulated the ideas of H. A. Lorentz and Fitzgerald, out of which the Special Theory of Relativity developed. Without your work this theory would today be scarcely more than an interesting speculation; it was your verifications which first set the theory on a real basis.” [41]

The realities of the scientific results, however, are quite different than what was assumed by Einstein and his colleagues. The fact is, the MMX *did* measure an ether drift. It just didn't measure a drift that would be expected if the Earth were moving around the sun at 30kms; rather, it measured a drift that was less than one-twentieth of 30kms. From his 1887 experiment, Michelson himself states: “Considering the motion of the Earth in its orbit only, this displacement should be $2Dv^2/V^2 = 2D \times 10^{-8}$. The distance D was about eleven meters, or 2×10^7 wavelengths of yellow light; hence, the displacement to be expected was 0.4 fringe. The original equation to determine the significance of the fringe shifts was: $\Delta t - \Delta t' = (l_1 + l_2)v^2/c^3$. Earth is translating at $v = 3.0 \times 10^4$ m/s, the speed of the Earth in its orbit around the Sun. In Michelson and Morley's experiment, the arms l_1 and l_2 were about 11 meters long. The time difference would then be about $(22\text{m})(3.0 \times 10^4 \text{ m/s})^2 / (3.0 \times 10^8 \text{ m/s})^3 \approx 7.3 \times 10^{-16}$ s. For visible light of wavelength $\lambda = 5.5 \times 10^{-7}$ m, say, the frequency would be $f = c/\lambda = (3.0 \times 10^8 \text{ m/s}) / (5.5 \times 10^{-7} \text{ m}) = 5.5 \times 10^{14}$ Hz,

which means that wave crests pass by a point every $1/(5.5 \times 10^{14} \text{ Hz}) = 1.8 \times 10^{-15} \text{ s}$. Thus, with a time difference of $7.0 \times 10^{-16} \text{ s}$, Michelson and Morley should have noted a movement in the interference pattern of $(7.3 \times 10^{-16} \text{ s})/(1.8 \times 10^{-15} \text{ s}) = 0.405$ fringe that they should have seen. But they state: "The actual displacement was certainly less than the twentieth part of this, and probably less than the fortieth part. But since the displacement is proportional to the square of the velocity, the relative velocity of the Earth and the ether is probably less than one-sixth the Earth's orbital velocity, and certainly less than one-fourth." [42]

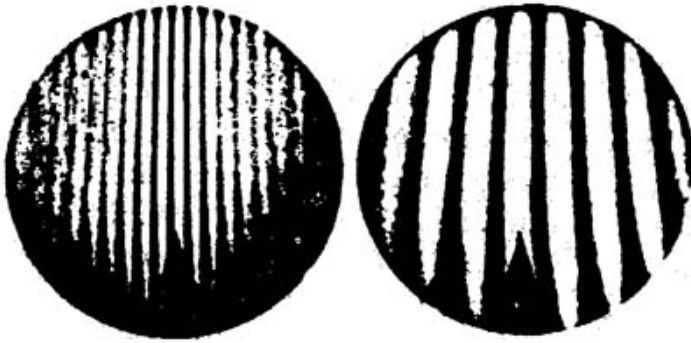


Fig. 12. Typical Ranges of Fringe-Shifting in Interferometry.

Interestingly enough, other scientists who did not like the spookiness of Relativity theory but who had never questioned the Copernican theory, had tried to disprove Einstein's Relativity by showing that there was an ether drift, and all of them were successful, whether the experiments were designed similar to the interferometer of MMX (e.g., Morley-Miller in 1903-1905) or the 1902 refractometer of Rayleigh [43] (e.g., Brace in 1904) [44]; or the electromagnetic plates of Trouton-Noble in 1903 [45]. Regardless, Einstein went ahead and submitted his famous 1905 paper, "On the Electrodynamics of Moving Bodies," which was the beginning of his Special Relativity theory. His opponents knew that something was amiss with Relativity so they continued with their interferometer experiments in order to show that ether was present in space. Subsequent to Einstein's 1905 paper came Georges Sagnac's 1913 interferometer experiment [46]; followed by Kennedy-Thorndike in 1927 [47]; Michelson-Pease-Pearson in 1926-1929 [48]; Michelson-Gale in 1925 [49]; and Dayton Miller's extensive work between 1905 to 1925 [50]. They all showed similar results and all concluded that ether was present in space. Einstein knew that if they were correct then Relativity theory was doomed. He stated: "If Michelson-Morley is wrong, then Relativity is wrong." [51] "I believe that I have really found the relationship between gravitation and electricity, assuming that the Miller experiments are based on a fundamental error. Otherwise the whole relativity theory collapses like a house of cards." [52]

Of course, the scientists who confirmed the ether's existence and nullified Relativity theory didn't know quite what to do with their results since all of them were avowed Copernicans. This is especially noted in the 1925 Michelson-Gale experiment (MGX): "The two beams returning to the original mirror produced interference fringes. The beam traversing the rectangle in a counter-clockwise direction was retarded. The observed displacement of the fringes was found to be $0.230 \pm .005$, agreeing with the computed value $0.236 \pm .002$ within the limits of experimental er-

ror." [53] Thus, right before Michelson's own eyes, the 1913 Sagnac results were confirmed as were his 1887 results, and both denied Relativity. Here was further proof, to the order of ten times the power of the Sagnac experiment, that there is, indeed, an absolute space in which absolute rotation occurs. Something was affecting the light in order for it to consistently produce the fringe displacement. Sagnac (1913) and Michelson (1925) demonstrated it was ether, which was quite an irony for the latter. Although Michelson would sum up the experiment with the sardonic comment: "All we can deduce from this experiment is that the earth rotates on its axis," [54] in reality, the experiment did not distinguish between an Earth rotating against the ether as opposed to the ether rotating around a fixed-Earth. In other words, it provided no proof that the Earth rotates, but opened the door very wide to suggest that Copernicus was wrong, since no translational motion corresponding to 30kms was found by Michelson and Gale. Analyzing the results of the Sagnac and Michelson-Gale experiments, Hayden and Whitney, in the revealing title: "If Sagnac, Why Not Michelson-Morley?" write: "The logical existence of the incremental Sagnac effect implies... that there is some compelling physical reason why the effect cannot be observed at the surface of the Earth.... We hold that until something new is brought to the table, this question simply cannot be resolved. No currently accepted theory reveals why, like a Cheshire cat, the Sagnac effect shows itself in one kind of experiment but not in another." [55] The authors are certainly correct in concluding, "until something new is brought to the table, this question simply cannot be resolved." The resolution staring them in the face but which has been "unthinkable" since the days of Lorentz and Einstein is that the Earth is not moving. Whereas Sagnac and Michelson-Gale, being themselves Copernicans, were testing for "The Effect of the Earth's Rotation on the Velocity of Light," the interpretation of their results in regard to a geocentric universe is that the Earth is motionless at the center of the universe. There is a slight movement of the ether against "the surface of the Earth" due to the rotation of the universe, which then shows up in miniscule fringe shifts in the interferometer experiments. Accordingly, since the Earth has no translational motion, experiments seeking to detect such motion will always come to a "null" result. The result, as we have seen, is not actually null; rather, all the experiments show a slight positive result (as did the original Michelson-Morley experiment in 1887), but the physicists and astronomers interpreting the results consider them null because they do not produce the expected fringe shifts if the Earth is understood to be moving through the ether by revolving around the sun at 30kms. In other words, if one presupposes a revolving and rotating Earth, the fringe shifts are always too small to account for such double motion. But if we assume a stationary Earth in the center of a rotating universal ether, there will, indeed, be as slight a movement of the ether against Earth as there would be against a ship in the eye of a hurricane. Using Michelson-Morley's original equation, the expected fringe shift for an ether rotating against a fixed Earth is as follows: $\Delta t - \Delta t' = (l_1 + l_2)v^2/c^3$. The Earth is said to rotate as $v = 4.65 \times 10^2 \text{ m/s}$. We thus have: $(22\text{m})(4.65 \times 10^2 \text{ m/s})^2 / (3.0 \times 10^8 \text{ m/s})^3 = 1.76 \times 10^{-19} \text{ s}$. The wave crests pass by at every $1.8 \times 10^{-15} \text{ s}$ which is divided into $1.76 \times 10^{-19} \text{ s}$, equaling $9.7 \times 10^{-5} \text{ s}$ or .00097 fringe to

account for a rotating ether around the earth. This is amply demonstrated by all the interferometer experiments in the course of 50 years. Robert Shankland categorized the experiments from Michelson to Joos. [56]. He separates them into "Fringe Shift Expected" (FSE) and "Fringe Shift Measured" (FSM). The results he records are as follows, with my ratios ["r"] supplied in brackets:

1881 Michelson: FSE: 0.04, FSM: 0.02 [r = 50%]
 1887 Michelson-Morley: FSE: 0.4, FSM: <0.01 [r = 2.5%]
 1902-04 Morley-Miller: FSE: 1.13, FSM: 0.015 [r = 1.3%]
 1921 Miller: FSE: 1.12, FSM: 0.08 [r = 7.1%]
 1923-1924 Miller: FSE: 1.12, FSM: 0.03 [r = 2.6%]
 1924 Miller (sunlight): FSE: 1.12, FSM: 0.014 [r = 1.2%]
 1924 Tomascheck (starlight): FSE: 0.3, FSM: 0.02 [r = 6.62%]
 1925-26 Miller: FSE 1.12, FSM: 0.088 [r = 7.8%]
 1926 Kennedy: FSE: 0.07, FSM: 0.002 [r = 2.8%]
 1927 Illingworth: FSE: 0.07, FSM: 0.0002 [r = 0.28%]
 1927 Piccard and Stahel: FSE: 0.13, FSM: 0.006 [r = 4.6%]
 1929 Michelson: FSE: 0.9, FSM: 0.01 [r = 1.1%]
 1930 Joos: FSE: 0.75, FSM: 0.002 [r = 0.26%]

Although some recent experiments claim not to find any ether drift to 10^{-15} (e.g., Kennedy-Thorndike) [57], Galev has discounted these since highly enclosed solid-state apparatus will invariably have difficulty in detection. Galaev also reports that the reason those after Joos kept seeing a "null" result was due to the use of metal chambers. Since most of the experiments used gamma radiation as the light source, the experimenters covered their apparatus with metal to protect themselves from harm. [58] Galaev concludes: "The known works...cannot be ranked as experiments which could confirm or deny Miller's results [or] confirm or deny the hypothesis about the ether's existence in nature." Hector Múnera adds: "...Joos' curves for individual measurements do not need to have the same amplitude and shape. Indeed, Joos observed such differences (see his figure 11, page 404). Unfortunately, Joos did not expect such variations (again, another instance of systematic error #2), so that he rejected all large amplitudes as due to experimental errors (he particularly mentions session 11 at 23:58). From smaller amplitudes, Joos obviously obtained a small velocity that he reported (translating from German) as 'an ether wind smaller than 1.5 km/s' (page 407). Even then, this is not a zero velocity." [59]

Ultimately, the problem with positive interferometry results for Copernican theory is that it cannot have a rotating Earth without also having a revolving Earth, since the seasons must be accounted for, thus it cannot use the results to its advantage. Considering the unanswerable problems the Sagnac and Michelson-Gale experiments present to modern physics and cosmology, it is no surprise that both experiments are hardly mentioned, if at all, in physics literature. It is likewise no puzzle that Einstein mentions neither crucial experiment in any of his writings.

I close with this quote from astrophysicist G. J. Whitrow: "It is both amusing and instructive to speculate on what might have happened if such an experiment could have been performed in the sixteenth or seventeenth centuries when men were debating the rival merits of the Copernican and Ptolemaic systems. The result would surely have been interpreted as conclusive evidence for the immobility of the Earth, and therefore as a triumphant vindication of the Ptolemaic system and irrefutable falsification

of the Copernican hypothesis. The moral of this historical fantasy is that it is often dangerous to believe in the absolute verification or falsification of a scientific hypothesis. All judgments of this type are necessarily made in some historical context, which may be drastically modified by the changing perspective of human knowledge." [60]

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