Response to Ian Musgrave of Panda's Thumb

on his Critique of Geocentrism

By Robert Sungenis, Ph.D.

http://pandasthumb.org/archives/2010/09/geo-xcentriciti.html

http://pandasthumb.org/archives/2010/11/geo-xcentriciti-1.html

Musgrave: There's been a lot of blank disbelief on the blogosphere of late, due to the announcement of a conference on Geocentrism (Galileo was Wrong). Geocentrism is the belief that Earth is the centre of the Universe and everything revolves around it. You would think that, 400+ years after Galileo, people would have cottoned on the the idea that the Earth orbits the sun, the sun orbits the galactic centre and the Milky Way galaxy does … well …complicated stuff with other galaxies, but basically we worked out long ago that the Earth is not the centre of the solar system, let alone the Universe.

R. Sungenis: No, it was never really "worked out," it was just assumed, and without any scientific evidence. Recent evidence from the Sloan Digital Sky Survey shows conclusive evidence that the Earth is in the center of the universe. The isotropy of the Cosmic Microwave Background Radiation, Gamma Ray Bursts, Quasars, and just about any other sources of energy or matter in the universe show that the Earth is in the center. Additionally, in the 1800s Michelson-Morley showed the Earth was not moving in space, as did Airy, Fresnel, Fizeau, Arago and many others. The only way Copernican science could answer these experiments was to turn physics upside down with shrinking rods, time dilation and mass increases, in order to make it appear to the public that the earth was moving at 18.5 mps. I will show more of these facts below.

Musgrave: Other people, especially Ethan at Starts with a Bang and the Bad Astronomer, have dealt with the technical details (and I have an earlier discussion here and here).

R. Sungenis: We have answered Ethan Seigel and it is posted on the www.galileowaswrong.com website. Suffice it to say, Mr. Seigel got all hung up on beating up a strawman of his own making (i.e., the Ptolemaic model). We have also answered Bad Astronomer in various forums. Suffice it to say, we have discovered that Phil Plait doesn't know the science of physics well enough in order to back up his objections to geocentrism.

Musgrave: My goal is to get you, the ordinary person on the Clapham omnibus (or in my case, the Outer Harbour train, where I am writing this), to try and demonstrate the Earth is heliocentric for yourself and to do so with common household materials. After all, science is at heart a practical endeavour, and non-professionals should be able to find the evidence for themselves.

So for this journey into the starry spheres, we will need a pair of binoculars, a camera tripod, some cardboard and alfoil, and lots of gaffer tape. We also have some luck, as the sky is currently cooperating in the Geocentrism debunking stakes.

First we have to ask ourselves, which "geocentric" theory are we disproving. The classic geocentric theory is that of Ptolemy, in which the planets, Moon and the Sun all orbit the Earth. The most famous variant of this is Tycho Brahe's helio-geocentric system, where the Sun and Moon orbits the earth and everything else orbits the Sun. There are important differences in the systems which we will explore later.

First off, let's look at the phases of Venus. For this you will need binoculars and the camera tripod. You will also need a way of attaching the binoculars to the tripod. These days I use a special attachment (but this requires modern binoculars that have a screw thread on the body), but in the past I have used gaffer tape to good effect. Why attach the binoculars to the tripod? Because otherwise there will be too much shaking for you to see the image properly.

The image to the left is the setup I use for observing Sunspots (we come to that later), showing the binoculars gaffer taped to the tripod.

At the moment, Venus is prominent above the western horizon. Point your binocular lash-up at Venus, in my 10x50 binoculars Venus is very small but is a disk which has a distinct "half -Moon" shape. If your binoculars don't have decent anti-glare coatings, you may have to observe in the early twilight in order to see Venus's shape without internal reflections from the binocular lenses getting in the way.

As you watch over the coming weeks, you will see Venus expand in size and become more crescent- shaped. Sketch the shape so you can follow its progress. This is so fast you should see a visible change in just one week. By mid-October Venus will be a thin crescent almost 2/3rds bigger than when you started observing. By late October Venus has nearly doubled in size and is a thin, glistening wire. Then Venus vanishes into the Suns glare and reappears in the morning. Over the next few months you can watch Venus shrink and become a tiny disk.

And now you have demolished the Ptolemaic geocentric system. Venus does have phases in this system, but quite unlike what you see here (I leave it too the reader to work out what a Ptolemaic systems Venus phases would look like, you can see a model of Ptolemaic Mercury here, which will give you a good idea). And you have only taken almost 6 months to do it (what, you thought it would be easy). As a reward, here's an animation of the Phases of Venus.

R. Sungenis: Let's be fair to Ptolemy. In his day the distances to the sun, moon and planets were not known. Hence, he could not create as accurate a model as would have been possible had he known the distances. Had he known the distances, he simply would have made the path of the sun around the earth the deferent of all the planets and the radius of the sun on the deferent to the planet equal to the distance from the sun to the planet. And if he did so, his model would have transposed into the Tychonic model, which is the model that has the planets revolving around the sun, but the sun revolving around the earth.

The only thing Galileo's telescope really did was destroy the crystalline spheres model of the geocentric universe from Aristotle. Aristotle proposed that the planets stayed in their orbits by rolling in tube-like circular structures made of crystal. These crystal-walled structures were supposed to be impervious to penetration. But once the telescope found objects crossing their paths (e.g., moons, asteroids, comets, etc.) the crystalline spheres model was abandoned.

All things considered, Ptolemy couldn't have had a crystalline spheres model since his equants and deferents were a little too wobbly for the rigidness of the spheres. In effect, Ptolemy's model was merely a computing device, never meant to represent the exact reality, and mainly because neither he nor anyone else knew how far away the sun or planets were. So he did the best he could. He rejected the Pythagorean/Aristarchus school which tried to make a heliocentric model with perfect circles, mainly because, as Hipparchus also discovered, that heliocentric model simply didn't match what everyone saw in the sky. The best Ptolemy could do was put the planets in epicycles to fit what he saw in the sky, at least for everything except Venus' phases.

But Ptolemy was not the only one making geocentric models. The Indians and Arabs were doing it also, and were getting very close to the truth. But since the west was so familiar with Ptolemy's model (and it worked to a reasonable degree), no one had really investigated the eastern models.

But when Tycho Brahe came on the scene, we might say that the "corrected" Ptolemaic model was finally produced. The sun's revolution around the Earth was made the deferent of all the planets and the problem was solved. That is because Tycho had computed the distances to the planets much better than Ptolemy.

But Kepler stole Tycho's forty-years worth of planet-charting (after, it is alleged, that he murdered him by mercury poisoning) and used the charts for his favored heliocentric model (which he was endeared to because of his occultism), and then he borrowed the idea of ellipses from Jerome Schreiber and came reasonably close to the movements of the planets. Of course, had Kepler applied the same elliptical orbits to Tycho's geocentric model, Tycho's model would have been just as accurate.

The fact remains, we don't use Ptolemy's model any longer, and haven't for about 500 years. If anything, we use Tycho's model or a variation of it.

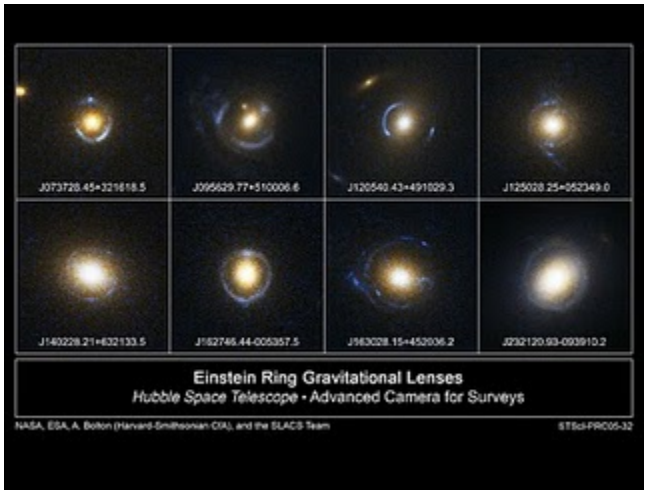
Musgrave: Left image Jupiter above the eastern horizon, Right Image, Venus above the western horizon, both at the same time in the evening (around 8pm ish in mid September 2010).

But wait! You say What if it is just an illusion, a trick of the optics? Well, you have a control. Having observed Venus, swing your binocular lash-up to the east, to the brightest object there (and second brightest non-lunar object in the night sky after Venus), Jupiter. Jupiter is a distinct oval in my binoculars, and the four bright Medicean Stars glitter around it. Over the nights you watch Venus swell and thin, keep an eye on Jupiter as it does…well…nothing.

Jupiter and three of its moons imaged with a mobile phone.

But Ah! The Medicean Stars, now known as the Galilean Moons, they will shuttle backwards and forwards during the nights as you watch. The realisation that these "stars" were Moons of Jupiter were not a blow to any form of geocentrism per se, although they were the second of a series of powerful blows

against the Aristotelian physics that underpinned Ptolemy's system, which aided its demise. Determining that these specs actually orbited Jupiter, and were not just accidentally there, took a lot of effort.



Try keeping track of these sparks, and without reference to an almanac, try and determine their orbits (heck, try and keep track of which near identical points of light are which). It may take a while, you will need to keep careful sketches, and track the Moons and Jupiter with respect to the stars as Jupiter moves through the heavens, but a) You are sketching Venus anyway and b) it will be well worth it (hey, you proving things for yourself!).

The next bit is more demanding. The Phases of Venus demolished the Ptolemaic Geocentric system, but the Tychonian- Geo-heliocentric system had Venus phases just like a pure heliocentric system (which is not surprising, as Tycho's system is an inverted Copernican system). To eliminate the Tychonian system, we need to observe sunspots.

Luckily the Sun is coming out of its quiet phase, so you will have some to record. For this you will need to set up a safe binocular projection system (as shown above), where the image of the Sun is projected onto a surface so you can record the Sunspots. NEVER LOOK DIRECTLY AT THE SUN WITH BINOCULARS AS SEVERE EYE DAMAGE WILL RESULT.

Anyway, while you are recording the Phases of Venus and the orbits of Jupiters' Moons, record the passage of Sunspots over the Suns face, over the 5-6 months you are recording the Sunspots, you will notice the path taken by the sunspots moves up and down. This is due to the Earths orbit not being exactly in the plane of the Suns rotation. In a geocentric system, with the Sun orbiting the earth once a day, this variation would show up on a daily basis, but what you observe can only be seen in a heliocentric system.

So, congratulations, you have just demonstrated that geocentric models don't describe the solar system we see using very simple tools. It took a while, and was hard work, but you have demonstrated it yourself, and all the blovation of geocentricists won't take that away (yes, Stellar parallax gets all the glory, but annual Sunspot variation was a powerful blow to Tychonian geocentric models). If you want to, you can take this further by making your own Foucault's Pendulum.

R. Sungenis: That Mr. Musgrave would attempt to use the movement of sunspots as a proof for heliocentrism probably says more about his scientific disability than anything else. The fact is, the movement of sunspots will be the same in either the heliocentric system or the geocentric system. Above Mr. Musgrave admitted that the "Tycho's system is an inverted Copernican system" and he correctly applied this principle to the phases of Venus, but now, for some reason, he is reluctant to apply the same principle to the movement of sunspots. Musgrave apparently does not know that the geocentric system has both an annual orbit and a diurnal orbit of the sun around the Earth. As such, when Musgrave compares the heliocentric annual orbit to the geocentric diurnal orbit he is comparing apples to oranges. He must compare the heliocentric annual orbit to the geocentric annual orbit, and when he does he will see that both the heliocentric and geocentric models show the same movement of sunspots. One can easily observe this phenomenon on our Galileo Was Wrong animations disc showing both the geocentric and heliocentric systems.

Musgrave: **Geo-xcentricities part 2; the view from Mars.**

By Ian Musgrave on November 15, 2010 2:24 PM | 146 Comments | No TrackBacks

Einstein rings, a spectacular prediction of relativity, taken from Hubble (Image credit Hubble/NASA)

You may remember a little while back I wrote about a conference of modern Geocentrism (Galileo was Wrong). Geocentrism is the belief that Earth is the centre of the Solar system, nay the entire Universe and everything revolves around it.

Todd Wood attended the conference, and you can read the about his growing sense of incredulity in his posts (part 1, part 2, part 3, part 4, part 5).

R. Sungenis: For the record, many of the presenters at the Galileo Was Wrong conference have responded to Mr. Wood's objections and sent them to him. Mr. Wood refused to respond any further. These responses to Wood will be posted on the Galileo Was Wrong website (www.galileowaswrong.com).

Musgrave: It turns out that these folks are relativity deniers.

R. Sungenis: What you can gather from Mr. Musgrave's use of the phrase "relativity deniers" is that Relativity is like a religion to him and his followers. If you question it, you are a "disbeliever" or perhaps a "heretic." All of modern science worships at the feet of Copernicus, Darwin and Einstein, and any deviation from these three gods of science will get one fired from a professorship faster than you can say Elmer Fudd.

The truth is, Relativity was invented in 1905 for two reason: one was to make one tensor equation out of Maxwell's two algebraic equations for how electromagnetism behaves (which we cannot get into now) and the main reason was to answer the Michelson-Morley experiment of 1887 that showed the Earth was standing still in space. You can read all about it in our book Galileo Was Wrong, or for a short version consult the post I put up at www.galileowaswrong.com titled "Is Einstein's Explanation of Relativity Kosher."

Musgrave: Image of the crescent Earth and Moon on October 3, 2007, taken by the HiRISE instrument of the NASA's Mars Reconnaissance Orbiter.

Which is pretty strange, the usual tack is to argue for Geocentrism based of relativistic frame equivalence. Arguing against relativity is pretty hard, as it is one of the best confirmed theories of physics we have. From gravitational lensing (see images above) to frame dragging, relativity has passed increasingly stringent tests with flying colours.

R. Sungenis: As General Relativity physicist Clifford Will has stated: "General Relativity has passed every solar-system test with flying colors. Yet so have alternative theories" ("The Confrontation Between Gravitation Theory and Experiment," General Relativity: An Einstein Centenary Survey, ed., Stephen W. Hawking, 1979, p. 62). The only thing at which Relativity has been successful is making the math work in its theory, but it hasn't proven that its physical description behind the math is a reality. Moreover, even the math of Relativity is little more than an assortment of fudge factors applied to physical anomalies. We go into great detail about this issue in our book, *Galileo Was Wrong*, and we quote the top physicists in the world to prove our point. Moreover, the three main purported proofs of Relativity: 1) the bending of light near the sun; 2) the perihelion of Mercury; and 3) the Hefele-Keating experiment, are some of the most laughable attempts at fudging the math ever perpetrated on the public. We examine these three "proofs" in great detail in the Appendices of Galileo Was Wrong in over 75 pages of scientific data. Even modern conveniences, such as the Global Positioning

Satellites, actually disprove Einstein's Relativity since the GPS has to be pre-programmed with the Sagnac effect in order to work. If you know anything about physics, in 1913 the Sagnac effect was the death knell to Relativity theory since it showed there was absolute motion, but Einstein ignored Sagnac, never once referencing him in his Relativity papers. There are many more such anomalies with Relativity theory, but much of it has been kept under wraps for many years. Increasingly, however, science is beginning to see the flaws in the whole system and much of what we report on the fallaciousness of Relativity is already reported in major physics journals and articles. We have researched these sources and used many of them in writing *Galileo Was Wrong*.

Musgrave: These geocentricists apparently need relativity disconfirmed so the the Michelson-Morely experiment proves the Earth at rest.

R. Sungenis: "Need relativity disconfirmed"? The only thing we need to do is to remind Mr. Musgrave that Relativity is a mere theory amongst other theories, but the Michelson-Morley experiment is one of the most confirmed empirical evidences that mankind has ever discovered, since between 1881 and 1932 about a dozen or so scientists tested it and all of them found an ether drift. They all found that the fringe shifting of light in the interferometers corresponded to a speed of less than one-sixth of the supposed orbital speed of the Earth. In other words, the interferometers (which are highly sensitive machines) did not show that the Earth was orbiting the sun. The most obvious solution to the data from the interferometers was what James Coleman describes:

> The easiest explanation was that the earth was fixed in the ether and that everything else in the universe moved with respect to the earth and the ether….Such an idea was not considered seriously, since it would mean in effect that our earth occupied the omnipotent position in the universe, with all the other heavenly bodies paying homage by moving around it. (James A. Coleman, *Relativity for the Layman*, p. 37)

Scientific historian Lincoln Barnett says much the same:

> The Michelson-Morley experiment confronted scientists with an embarrassing alternative. On the one hand they could scrap the ether theory which had explained so many things about electricity, magnetism, and light. Or if they insisted on retaining the ether they had to abandon the still more venerable Copernican theory that the earth is in motion. To many physicists it seemed almost easier to believe that the earth stood still than that waves – light waves, electromagnetic waves – could exist without a medium to sustain them. It was a serious dilemma and one that split scientific thought for a quarter century. Many new hypotheses were advanced and rejected. The experiment was tried again by Morley and by others, with the same conclusion; the apparent velocity of the earth through the ether was zero. (*The Universe and Dr. Einstein*, p. 44)

But to keep the Earth moving and save the world from having to go back to pre-Copernican days, science had to find another solution, but it was very, very difficult. Lorentz was so flabbergasted by the results of Michelson-Morley that he wrote these words is to his physicist colleague Lord Rayleigh in 1892 (five years after the MM experiment): "I am totally at a loss how to solve the contradiction and yet I believe that if Fresnel's wave theory is abandoned, we should have no adequate aberration theory at all….Can there be some point in the theory of Mr. Michelson's experiment which has as yet been overseen?" (Letter dated August 18, 1892, from the Lorentz microfilm at the Niels Bohr Library, New York). But Michelson's experiment had no flaws. Thus science was forced to produce an unnatural and obtuse solution to keep the Earth from standing still in space.

The first option was to say (as Lorentz tried to do) that matter shrunk when it moved through ether just enough to mask the Earth's orbital speed. He then concocted the equation $L = \sqrt{(1 - v^2/c^2)}$ so as to put the masking into a mathematical formula. Einstein came after Lorentz and used the same equation but eliminated ether and applied $L = \sqrt{(1 - v^2/c^2)}$ to the shrinking of time and increase of mass instead of shrinking lengths in order to give light a constant speed. Either solution (Lorentz's or Einstein's) gives birth to "Relativity," in this case Special Relativity. In effect, both Lorentz's and Einstein's answer were not empirically tested solutions but merely mathematical lashups to save the appearances. In the end, Special Relativity ended up contradicting itself (e.g., the twin Paradox); and since it did not incorporate gravity it was useless, since few things in life move only in uniform motion. So ten years later Einstein patched the holes in Special Relativity theory by inventing General Relativity, and in the process he took back the

ether he eliminated with Special Relativity as well as discredit his "time-shrinking" solution for Michelson-Morley since light does not travel at a constant speed in General Relativity. Here is 1993 Nobel laureate in physics Robert Laughlin on Einstein's contradiction between STR and GTR:

> In the early days of relativity the conviction that light must be waves of something ran so strong that Einstein was widely dismissed. Even when Michelson and Morley demonstrated that the earth's orbital motion through the ether could not be detected, opponents argued that the earth must be dragging an envelope of ether along with it because relativity was lunacy and could not possibly be right…. Relativity actually says nothing about the existence or nonexistence of matter pervading the universe, only that such matter must have relativistic symmetry.

And he concludes with this important paragraph:

> It turns out that such matter exists. About the time relativity was becoming accepted, studies of radioactivity began showing that the empty vacuum of space had spectroscopic structure similar to that of ordinary quantum solids and fluids. Subsequent studies with large particle accelerators have now led us to understand that space is more like a piece of window glass than ideal Newtonian emptiness. It is filled with "stuff" that is normally transparent but can be made visible by hitting it sufficiently hard to knock out a part. The modern concept of the vacuum of space, confirmed every day by experiment, is a relativistic ether. But we do not call it this because it is taboo (Robert B. Laughlin, A Different Universe: Reinventing Physics from the Bottom Down, 2005, pp. 120-121).

Here is Einstein admitting his own contradictions between STR and GTR, as well as his fudging on the constancy of the speed of light when he invented GTR:

> "In the second place our result shows that, according to the general theory of relativity, the law of the constancy of the velocity of light in vacuo, which constitutes one of the two fundamental assumptions in the special theory of relativity and to which we have already frequently referred, cannot claim any unlimited validity" (Albert Einstein, Relativity: The Special and the General Theory, authorized translation by Robert W. Lawson, 1961, p. 85).

> "In a similar manner we see immediately that the principle of the constancy of the velocity of light in a vacuum must be modified. For one easily recognizes that the path of a beam of light, relative to K', must generally be crooked, when the light, with respect to K, moves in a straight line with definite constant velocity" (The Case Against Einstein, Arthur Lynch, pp. 209-210).

Here is Einstein on his taking back of ether:

> "According to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether. According to the general theory of relativity space without ether is unthinkable; for in such space there would not only be no propagation of light, but also no possibility of existence for standards of space and time (measuring rods and clocks), nor therefore any space-time intervals in the physical sense" (Albert Einstein, "Geometry and Experience," in Sidelights on Relativity, 1983, p. 30).

Musgrave: Now there is a lot of problems with this (not the least because they need a non-moving ether to explain the M-M experiment,

R. Sungenis: No, we don't "need a non-moving ether to explain the M-M experiment." The ether exists, moving or non-moving, flexible or inflexible. The Michelson-Morley experiment verified ether's existence, as did all the other hundreds of thousands of trials in over a dozen interferometer experiments to 1932, as well as maser and laser experiments through the 1960s, as well as the GPS system in the 1990s. Ether is the death knell to Special Relativity, whether the ether moves or is non-moving, but Geocentrism can use either a moving or non-moving ether. As it stands, the Michelson-Morley experiment did not allow a movement of ether against the Earth corresponding to an

orbital speed of the Earth of 18.5 miles per second. It only allowed an ether moving less than one-sixth of that speed, which can be explained by either a rotating Earth against a fixed ether or a rotating ether against a fixed Earth. But since heliocentrism must have both a revolving Earth and a rotating Earth to explain the seasons (not just a rotating Earth) then the only solution to Michelson is a rotating ether around a fixed Earth, that is, Geocentrism.

Musgrave: then a moving ether to explain Foucault's Pendulum) and other geocentrist positions.

R. Sungenis: No, because the same rotating ether around a fixed Earth explains the centrifugal and Coriolis forces that affect Foucault's Pendulum. Mr. Musgrave needs to read our book, for there he will find out that most scientists today admit the existence of ether, and most say that a rotating universe of ether around a fixed earth is equivalent to a rotating earth in a fixed universe.

Musgrave: Some of the problems can be demonstrated with intensive mathematics, some with not so much maths (like the claim that GPS doesn't use relativistic corrections, which is untrue.)

R. Sungenis: Mr. Musgrave is twisting the evidence. I suggest that you look at the link he provides since there my co-author, Dr. Robert Bennett, sets the record straight about the GPS and the Shaprio delay (Dr. Bennett also covers the Shapiro Delay in Chapter 10 of *Galileo Was Wrong: The Church Was Right.* I cover the issues about the GPS in Appendix 6. What is plainly evident, as I noted above, is that the GPS is pre-programmed with the Sagnac effect due to the empirical evidence for ether and absolute motion discovered by Georges Sagnac in 1913. As one GPS technician puts it: "In the GPS, the Sagnac effect can produce discrepancies amounting to hundreds of nanoseconds" (Neil Ashby, "Relativity and the Global Positioning System," Physics Today, May 2002, p. 5). He then says: "A Sagnac correction is needed to account for the diurnal motion of each receiver during signal propagation. In fact, one can use the GPS to observe the Sagnac effect." (p. 6)

Musgrave: Earth as seen from Mars taken by the Spirit rovers' panoramic camera in 2004.

However, in the spirit of my first post on this conference, where I tried to get people to do observations themselves that disproved first the Ptolemaic then the Tychonian systems, I want to get people to do something much simpler, related to observational astronomy.

Also in the spirit of Einstein, who tried to imagine what the word would look like if you were travelling on a photon, I want you to imagine your are standing on Mars.

The evening sky on Mars on April 29, 2005 as simulated by Stellarium (the location isn't at the same latitude and longitude as opportunity, so the view is slightly different from the rover).

What would you see from the surface of Mars that would be different in a Tychonian system (the system favoured by our modern geocentricists) versus a heliocentric system system?

As the Tychonican system is an inverted Copernican system, things like the phases of the Earth would be identical (see this JAVAscript model, advance the time to October 3, 2007 to match the image of crescent Earth and Moon above, and flip between the Tychonian and Heliocentric models to see what I mean).

Earth imaged by the panoramic camera of Opportunity an hour after Sunset on April 29, 2005 (Image Credit NASA/JPL).

There is a big difference that would be immediately apparent. Whether in the Tychonian or Heliocentric systems, from the point of view from Mars, Earth would appear to be a morning or evening star that appeared to revolve around the Sun.

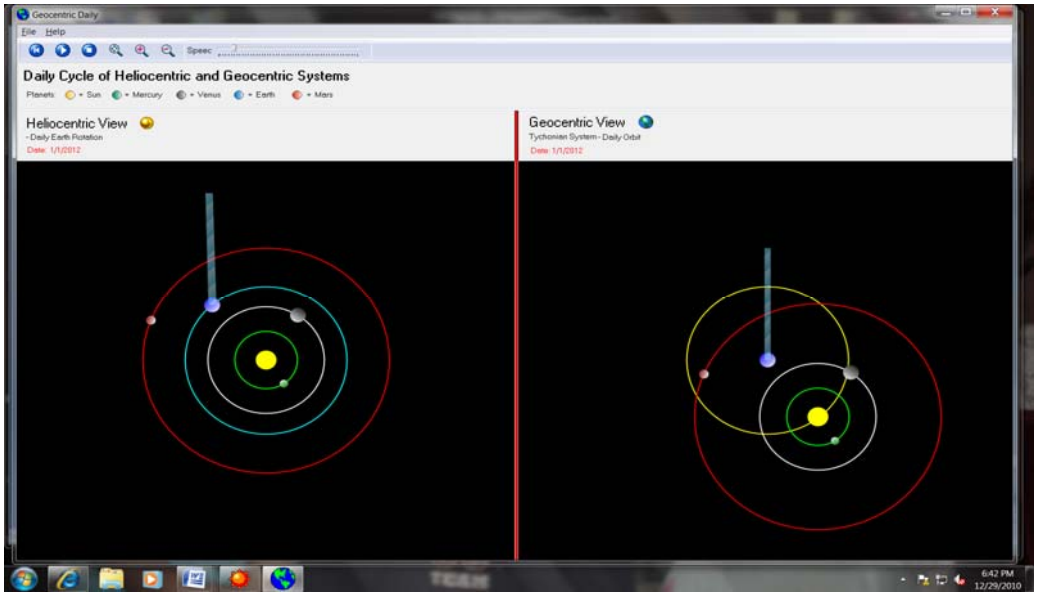
R. Sungenis: First, I don't know what "big difference" Mr. Musgrave is referring to. Big difference from what?

Musgrave: However, the geocentricists are using a geostationary model, where the 24 hour day is produced by the Sun rotating about the Earth. So in a period of 24 hours, an observer on Mars (armed with an occultation disk) would see Earth rise from the sun, then fall back, then reappear on the other side of the sun and repeat the process again.

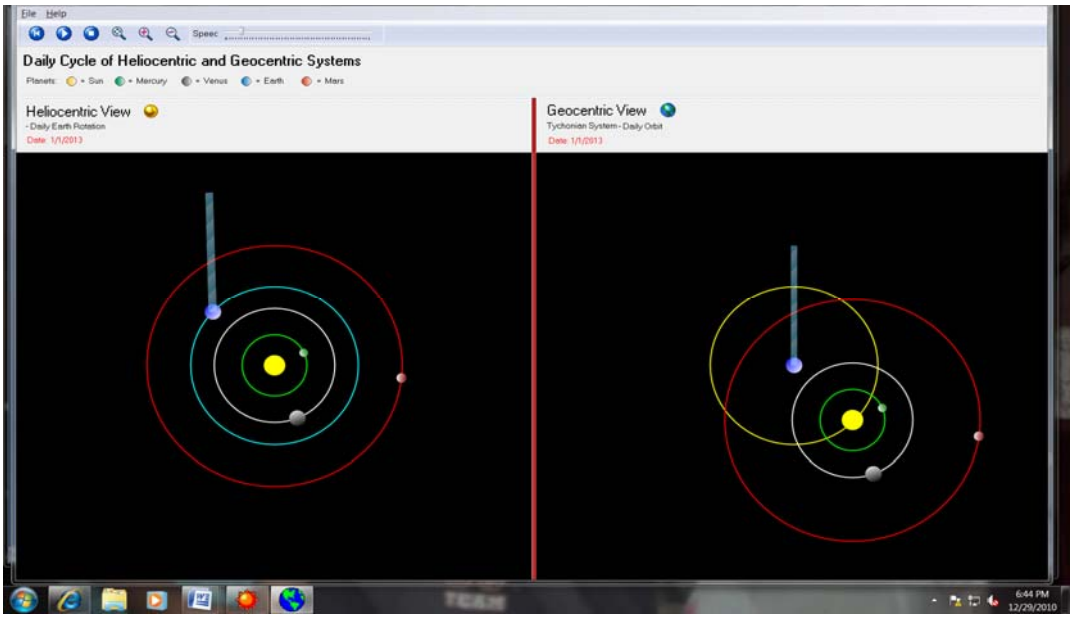
R. Sungenis: No he would not. This can be proven very easily by consulting our animation disc of the heliocentric and geocentric systems. Each day that Mars rotates (24 hours and 39 minutes) an observer in the same place on Mars will

see the same separation angle of Earth and the Sun in the geocentric system that is seen in the heliocentric system. For example, on Jan. 1, 2011 (see pictorial at left), a viewer from Mars will see the Earth and Sun almost in conjunction (a conjunction that will be in perfect alignment on Feb. 7, 2011). All we need do here is imagine Mars rotating each day. As such, he will see the same alignment, but with a slight difference from day to day as Mars revolves around the sun. What Mr. Musgrave forgot to incorporate is that in the geocentric system Mars is moving WITH the sun around the Earth. If Mars were stationary, yes, we would see what Mr. Musgrave refers to above ("we would see Earth rise from the sun, then fall back, then reappear on the other side of the sun and repeat the process again").

On Jan 1, 2012, the same viewer on Mars will see the Earth in a gibbous phase in the eastern sky.



On Jan 1, 2013, he will see Earth in his upper western sky in a three/quarter phase.



On Jan 1, 2014 he will see Earth in the far eastern sky, in quarter phase.

Musgrave: During the period that the Mars rovers took images of the Earth, at maximum elongation Earth was 42-47 degrees from the Sun as seen from Mars.

R. Sungenis: As we can see from the pictorial below, it is correct that Earth would be about 42-47 degrees from the sun:

Musgrave: For the Earth to move from maximum elongation to inferior or superior conjunction (at least, as it would appear from Mars, because in the Tychonian system Earth can't have conjunctions)

R. Sungenis: Somewhat misleading statement, since it implies that the Tychonian system is somehow different in geometric structure than the heliocentric system. The reason Earth will not have a conjunction is simply because you don't count it as a conjunction if it is the center object, and in the geocentric system Earth is the central object.

Musgrave: …takes 6 hours (in a 24 hour day there will be four 6 hour segments as the Earth goes out, comes back, goes out and comes back again from the solar disk).

So the Earth will appear to move 42 degrees (taking the lowest figure) in 6 hours, or 7 degrees per hour against the background stars (approximately, it's slightly more complicated than this, but rough figures are all we need). That's 14 Lunar diameters per hour! Earth is fairly hooting along compared to the background stars. In one minute Earth would move 1/4 of a Lunar diameter which is quite noticeable.

R. Sungenis: No, this is all incorrect. As we noted above, Mr. Musgrave forgot to include Mars in the revolution around sun, which means that both the sun and Mars revolve around the Earth on a daily basis. From that perspective the observer on Mars is going to see the same angle of separation between the Earth and the sun that is seen in the heliocentric perspective.

Musgrave: Now look at the image above. It is a composite of 3 x 15 second images taken with the panoramic camera, you can see the image of Earth is slightly elongated. However, remember that Mars rotates, and any 15 second exposure will cause slight star trailing due to its rotation. The trail we see of Earth is nothing like what we would expect if it was moving to a 24 hour rhythm, as it hares along the sky (roughly $1/5^{th}$ of a Lunar diameter). Still, for confirmation we have to check Earth's movement against that of the background stars.

Fortunately, in the original image there is a background star just above Earth (it's best seen in the TIF file). It has the same degree of elongation that the Earth does. This falsifies the Tychonian system, thus the solar system is heliocentric.

So "Eppur si muove" because it um, doesn't move (with respect to the background stars as seen from Mars).

R. Sungenis: Mr. Musgrave just hung himself. If Earth and the star he purports to see in the photograph have the same elongation, then the elongation cannot be due to an independent movement of the Earth. It can only be due to the rotation of Mars. In other words, since Mars rotates, the light from both the Earth and the star will be elongated. The elongation only proves is that Mars rotates, not that the heliocentric system is true. Mars rotates in either the heliocentric or geocentric systems and thus the elongation will appear in both models.

Eppur si *no* muove.

Robert Sungenis

December 29, 2010