MacAndrew Walks the 'Planck' and Falls into the Quantum Sea

R. Sungenis: Yes, yet another attempt by my ideological opponents, Palm and MacAndrew, to discredit me and geocentrism; alas with the usual schoolyard name-calling and gossip grist innuendos. So I once again take this opportunity to defend the biblical and traditional cosmos against the atheists of popular science. I write this for my patrons, not for my opponents who will remain in their blindness no matter how much evidence they see. So let's see who gets their comeuppance ☺

MacAndrew: Aether, Springs, and Light: Physics Blunders in Galileo Was Wrong. Introduction: I sometimes browse Mr Robert Sungenis's Facebook page here, the one called *Ask Robert Sungenis about Geocentrism*, because the spectacle of a man virtually devoid of education in science giving absurd answers to earnest scientific questions posed by his undiscerning admirers can be very funny.

R. Sungenis: Here's what actually happens. MacAndrew doesn't browse my Facebook. That search for grist for the gossip mill is done by David Palm (as one can see by his signature stamp "look here and here" all over this paper). Palm scours my internet dialogues on a daily basis looking for something he thinks he can pounce on to attempt to discredit me. If it's too complicated for his scientifically challenged mind, he runs to his mommy, Alec MacAndrew, for answers, but Palm puts the final piece together and then lies about who wrote it (as he did above). It never ceases to amaze me the lengths Mr. Palm will go to try to discredit me.

As for my credentials and knowledge, all one need do is check the endorsements from Ph.Ds in physics and astronomy in the opening pages of *Galileo Was Wrong* to know that, according to my peers, I'm not "devoid of education in science" and do not give "absurd answers." We likewise receive nothing but glowing responses to our movie, *The Principle*, and our DVD, *Journey to the Center of the Universe*. Here is one recent review from Harry Hamlin Ricker III, Master of Science, a retired professor from John Hopkins University of Applied Physics (http://galileowaswrong.com/fantastic-review-of-the-new-dvd-galileo-was-wrong). Ricker gave us a near-10 score on all aspects of the DVD, especially the science.

Here is an endorsement I received several years ago from Wolfgang Smith, a professor of physics and mathematics at MIT:

> April 2010: "Dear Dr. Sungenis: Since writing to you two days ago to thank you for your letter and the gift of your two-volume treatise, I have had a chance to peruse this work and feel compelled to congratulate you and Dr. Bennett on this outstanding achievement! Though I am not usually a loss for words, I find it hard to express my admiration for this masterpiece, which has no peer and constitutes without a doubt the definitive work on the subject of geocentrism…You are to be

congratulated not only on your erudition and command of an incredibly vast subject matter, but also on the logical clarity of your presentation and lucidity of style. At your hands this subject of virtually unimaginable complexity becomes 'almost' simple, and certainly understandable (up to a point) to nonspecialists. Let me not swell this letter; perhaps I will get back to you on some specific points. Today I just wanted to express my admiration for your book, which strikes me as epochal in its implications…Yours sincerely in Christ, signed, Wolfgang Smith."

As for my science knowledge, I can safely say I know more than MacAndrew and Palm combined. That's because Palm knows very little about physics and astronomy since his expertise is in computers. So Palm employs the services of Alec MacAndrew, an atheist physicist from England. But the problem is, since Palm doesn't know the science, he doesn't know if MacAndrew's analysis is correct anymore than he knows whether his great grandfather liked baseball, but he swallows all of MacAndrew's atheistic garbage nonetheless because, well, he has an unquenchable vendetta against Robert Sungenis, so anything that attacks Robert should be good enough to accomplish his insidious task.

As for MacAndrew, he has already been deceived by the godless science of the day because MacAndrew is an atheist who is devoted to undoing Christianity, and thus he always starts out with the wrong answer. He then sits there in wonder as to why none of his theories work (oh, except if you add these ingredients: Inflation, Dark Matter, Dark Energy, superluminal expansion and a Multiverse (all without the slightest evidence or proof that they exist); and then add in a fatuous gripe that geocentrists should not be appealing to Einstein's General Relativity even though GR supports geocentrism; and then add that instead of the simple answer of a motionless Earth we should accept the complicated world of length contraction and time dilation, even though none of them have been shown to exist, much less proven). This is the world of Alex MacAndrew – a veritable house of cards that is built on nothing but hot air.

MacAndrew: As it is on the Facebook page <u>here</u>, where Sungenis answered a question about the propagation of light in a "rotating universe". There is much wrong with his reply, which we'll get to later, but one very elementary mistake jumped out at me. His reply depends on the existence of a speculative medium, the "geocentric aether", which he invented and which he believes is needed for the propagation of light.

R. Sungenis: MacAndrew, courtesy of David Palm, is a liar. I didn't invent the aether. It was understood to exist long before I came along. Here is the real truth: the 1887 Michelson-Morley experiment—based on the scientific acceptance of aether—showed that the Earth wasn't moving in space. Einstein got rid of the aether in his Special Relativity theory so that he could make everyone believe the Earth was moving. But if one takes away the aether, one must resort to this crazy thing called "length contraction" (which claims that objects shrink when the move) and "time dilation" (because if the object shrinks, then it won't get to its designated target in the same time, so you have to increase the time that it travels). But no one has ever seen length contraction or time dilation. They are just mathematical

inventions to save the world from having to go back to geocentrism. This is the make-believe world that Alec MacAndrew lives in.

MacAndrew: He claimed, among other things, that the speed of light depends on the tension in the aether (don't worry, we'll come back later to these claims about how light travels) and he provided an analogy for how he thinks this works. The analogy he chose is a spring in tension and he gave an expression for the speed of waves along such a spring. His expression is $v = T/\mu^{-2}$ (T is the tension and μ is the mass per unit length of the spring). This is hopelessly wrong – the correct expression is $v = \sqrt{(T/\mu)}$. Also, the expression T/μ^{-2} is bizarre because it is mathematically awkward – one would usually write it $T\mu^2$ (but perhaps he meant $(T/\mu)^{-2}$, which, although less awkward mathematically, is still wrong so far as the physics goes).

R. Sungenis: As MacAndrew realizes below that this is what happens when MacAndrew gets his info from a blog that isn't user-friendly for units or square roots. If he had checked my book, on page 269 of the 11th edition (and near that page in other editions) he would have seen this footnote: "The equation for determining the velocity of the vibration is $v = \sqrt{T/\mu}$ where v is the velocity of the vibration, T is the tension of the spring and μ is the mass of the spring divided by its length." But, of course, it is so much more beneficial for MacAndrew to take the opportunity to put doubt in the reader's mind of my mathematical abilities, which MacAndrew has done before.

MacAndrew: Further on, Sungenis claimed that if the tension is 100 times greater, the speed would be "100^{-2} or 10 times greater". This is grotesquely wrong because 100^{-2} is another way of writing $1/100^2$ which is $1/10,000$ which equals 0.0001. 100^{-2} is not 10 – it's not even close. He is out by a factor of 100,000. What's going on here? I realised that most of his answer was based very closely on a section in his book, *Galileo Was Wrong*[1] (GWW) where he used the correct expression for the speed of the wave in a tensioned spring.[2] Then it dawned on me that Sungenis, in transcribing the contents of GWW to the Facebook com-box, had been forced to use exponential notation because the symbol, '√', representing a square root is not available in Facebook comments. Fair enough. But unbelievably, shamefully, he knows so little about arithmetic notation, indeed far less than a good high-school pupil does, that he thinks x^{-2} means the square root of x. Not true – of course x^{-2} doesn't mean the square root of x – it means $1/x^2$, the reciprocal of the square of x. The square root of x, written in exponential notation is, of course, $x^{1/2}$, and so the things he should have written were $v = (T/\mu)^{1/2}$ and $100^{1/2}$ (rather than what he did write, $v = T/\mu^{-2}$ and 100^{-2}; the differences are profound). This ought to be within the compass of anyone who has benefitted from a modest general education and yet it is beyond him. This is a man who would overthrow the worlds of physics, astronomy and cosmology – I find it absurd and dispiriting that his vaulting ambition should so overstep his meagre ability. And not one of his followers on the *Ask Robert* Facebook page picked him up on this latest blunder which we can now add to his long and dismal list of incompetent mistakes.

R. Sungenis: That was a simple slip of the pen on the blog site that doesn't allow proper notation. No such mathematical nomenclature would be found in my book, but it is to

MacAndrew's advantage not to reveal the little detail because, after all, he said it himself – he wants to make me look "unbelievably shameful."

MacAndrew: But this boogaloo is all by way of preamble. Having been led to this section in GWW, I noticed he makes other claims there about the geocentric aether in which he gets the physics exactly backwards, and that is what this article is really all about.

R. Sungenis: We will see that it is MacAndrew who gets it "exactly backwards."

MacAndrew: 2 Sungenis's imaginary friend: What is this Planck-aether medium of geocentrism that Sungenis bangs on about?[3] Well, he isn't very clear about it himself, except that its properties are always exactly what he needs them to be in support of geocentrism.

R. Sungenis: That is false, of course. The problem, as you will see is that MacAndrew doesn't like how neatly a Planck-aether medium fits into the understanding of the universe.

MacAndrew: He certainly isn't at all clear about how his Planck-aether can be detected (it hasn't been, either directly or indirectly), nor how we can know of its existence and measure its properties (the properties can't be measured, because the thing itself has not been detected). MacAndrew: However, we can infer something about his proposition from his description: "In the geocentric system, a diurnally rotating universe creates tremendous centrifugal forces which, according to Einstein's own covariance equations, are equivalent to the force of gravity. As such, light traveling in this kind of superdynamic environment can greatly exceed 3×10^8 m/sec. As Rosser notes "light can assume *any numerical value* depending on the strength of the...centrifugal gravitational field" which has "enormous values at large distances." In the Planck-ether medium of geocentrism, the speed of a transverse wave, such as light, depends on the tension between the Planck particles." *[His emphasis and his ellipsis].* The Planck-aether medium of geocentrism is Sungenis's own invention that consists of a solid plenum of Planck particles, which are highly speculative hypothetical entities that have not been detected either directly or indirectly.[4]

R. Sungenis: It's not MY Planck-aether. I'm merely borrowing from the best minds in physics who have taught us about the Planck aether and applying it to geocentrism.

In 1957, Princeton professor John Wheeler was the first to coin the term "space-time foam."[1] Stephen Hawking supported Wheeler's theory, stating that, on extremely small scales in the Planck dimensions, space is alive with "turbid random activity and gargantuan masses."[2] Others, such as Ian Redmount and Wai-Mo Suen speak of "quantum space-time foam" or "Lorentizian space-time foam,"[3] as does S. J. Prokhovnik.[4] F. Selleri understands

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[1] John A. Wheeler and C. M. Patton, "Is Physics Legislated by Cosmology?" *The Encyclopedia of Ignorance*, editors: Ronald Duncan and Miranda Weston-Smith, *Pocket Books*, 1978, pp. 19-35.
[2] *Black Holes and Baby Universes and Other Essays*, Bantam, 1994; *A Briefer History of Time*, pp. 104-123.
[3] *Physical Review D*, 3rd series, vol. 47, No. 6, March 1993; I. Redmount and W.-M. Suen, "Is Quantum Spacetime Foam Unstable?" *Rapid Communication, Physical Review D*, 47, 2163 (1993); "De Broglie Waves on Dirac Ether," *Lettere Al Nuovo*

the CMB as the fundamental reference frame, pointing out that any object that travels through it is affected by radiation pressure.[5] Jean-Pierre Vigier refers to it as a "non-empty vacuum" and outlines the phenomenon of superluminal interactions in an "underlying deterministic substructure."[6] Vigier points to the experiments by Alain Aspect, which confirm the results.[7] Robert Moon, professor emeritus in physics at University of Chicago, adds "According to accepted theory, free space is a vacuum. If this is so, how can it exhibit impedance? But it does. The answer, of course, is that there is no such thing as a vacuum, and what we call free space has structure. The impedance equals 376+ ohms."[8] Many theorists appeal to ultra small particles to explain the phenomenon of gravity by such names as "gravitons," "machions," "messenger particles," or "force-carrier particles." Included among these particles are electropon pairs, which are said to have a time-scale existence of 10^{-21} seconds. Another explanation, going by the name of String Theory, holds that, rather than space being filled with point particles, it consists of one-dimensional "strings" that are 10^{-33} cm in length.[9]

Other discoveries have also added to the mystery. In 1948 Hendrik Casimir discovered that two mirrors facing each other in a perfect vacuum have a mysterious force acting upon them that draws them together, which is appropriately called "the Casimir effect."[10] This is a force that seems to appear out of nowhere, since in a vacuum there would be no obvious forces or material substances carrying them, yet a force it was. Current science tries to explain the appearance of this force as a "vacuum fluctuation." The editor of the *Astrophysical Journal*, Bernard Haisch, says that the Casimir effect shows the existence of a "zero-point field."[11] Roger Penrose has coined the word "twistors" for his particles of choice, has stated that the concept of "space-time" may be eliminated from the basis of physical theory altogether.[12] Abhay Ashtekar holds that at the Planck scale the concept of space-time is replaced by a network of what he calls "loops and knots" of energy. This

Cimento, vol. 29, No. 14, Dec. 1980; W.-M. Suen, "Minkowski Spacetime is Unstable in Semi-Classical Gravity," *Physical Review Letters*, 62, 2217 (1989).

[4] S. J. Prokhovnik, "Light in Einstein's Universe," Dordrecht, Reidel, 1985; "A Cosmological Basis for Bell's View on Quantum and Relativistic Physics," in *Bell's Theorem and the Foundation of Modern Physics*, eds., A. Van der Merwe, F. Selleri, G. Tarozzi, New Jersey, World Scientific, 1990, pp. 508-514.

[5] F. Selleri, "Space-time Transformations in Ether Theories," *Z. Naturforsch*, 46a, 1990, pp. 419-425.

[6] J. P. Vigier, "Causal Superluminal Interpretation of the Einstein-Podolsky-Rosen Paradox," and "New non-zero photon mass interpretation of Sagnac effect as direct experimental justification of the Langevin paradox," *Physics Letters A*, 234, 1997, pp. 75-85; *Physics Letters A* 175, 1993, p. 269.

[7] *Physical Review Letters*, vol. 49, No. 2, July 12, 1982.

[8] "Space Must Be Quantizied," *21st Century*, May-June, 1988, p. 26ff.

[9] Brian Greene, *The Fabric of the Cosmos: Space, Time and the Texture of Reality*, New York: Alfred A. Knopf, 2004, p. 369.

[10] Hendrik B. G. Casimir, Proc. Kon. Ned. Akad. Wetensch. B51, 793, 1948; S. Lamoreaux, *Physical Review Letters*, 78, 5, 1996; M. Bordag, U. Mohideen and V. M. Mostepanenko, "New developments in the Casimir effect," *Phys. Rep.* 353 1, 2001; H. B. Chan, et al., "Nonlinear micromechanical Casimir oscillator," *Physical Review Letters* 87, 211801, 2001; F. Chen and U. Mohideen, "Demonstration of the lateral Casimir force," *Physical Review Letters* 88, 101801, 2002; C. Genet, A. Lambrecht and S. Reynaud, "Temperature dependence of the Casimir force between metallic mirrors," *Physical Review* A 62 012110, 2000; K. Lamoreaux, "Demonstration of the Casimir force in the 0.6 to 6 micrometer range," *Physical Review Letters* 78 5, 1997; K. A. Milton, *The Casimir Effect: Physical Manifestations of Zero-point Energy*, World Scientific, Singapore, 2001.

[11] Bernard Haisch, scientific editor of *The Astrophysical Journal* and editor-in-chief of the *Journal of Scientific Exploration*, has postulated that the Casimir Effect is due to the exclusion of the zero-point field from the gap between the plates, which was worthy enough to be published by *Physical Review*, (B. Haisch, A. Rueda, and H.E. Puthoff, Physical Review A, 49, 678, 1994.

[12] Roger Penrose, *The Road to Reality: A Complete Guide to the Laws of the Universe*, New York, Alfred Knoph, 2005, pp. 968-1002.

theory is being further developed by Carlo Rovelli and Lee Smolin.[13] The seeming inevitable position to which science is being led is that there is a world of activity occurring at Planck dimensions that underlies everything that happens in the universe. Obtaining the right understanding of this Planck universe will ultimately set aside both Relativity and Quantum Mechanics. Alan Kostelecký writes in *Scientific American*: "The observable effects of Planck-scale Relativity violations are likely to lie in the range of 10^{-34} to 10^{-17}."[14] Kostelecký then says:

> Whatever the eventual form of the ultimate theory, quantum physics and gravity are expected to become inextricably intertwined at a fundamental length scale of about 10^{-35} meters, which is called the Planck length, after the 19th century German physicist Max Planck. [15]

MacAndrew: The uniform density of Planck particles would be 4.9 x 10^{91} g/cm^3.

R. Sungenis: No, it would actually be 10^{94} g/cm^3.

MacAndrew: Such a density would mean that the mass of Sungenis's aether in one cubic centimetre is a stupendous factor of 10^{36} more than the ordinary mass in the *entire observable universe*. There is no known physical phenomenon which depends on their existence. Note that Sungenis's Planck-aether is neither the long-abandoned classical luminiferous aether, nor the energy of the vacuum, neither of which have properties anything like that claimed by Sungenis for his Planck-aether. Working physicists don't think that Planck particles or a solid aether made of them actually exist. Indeed, the mass-energy density of space is *measured* to be about 10^{-29} g/cm^3(about 5 hydrogen atoms per cubic metre), or about 10^{109} times less than Sungenis's Planck-aether – direct observational evidence that it doesn't exist. It's a complete fantasy.

R. Sungenis: The one who is living in a "fantasty" is Alec MacAndrew, since he knows that his Inflation - Dark Matter - Dark Energy - superluminal expansion - Multiverse world is nothing but an illusion, built up by patchwork physics that is determined to save the reigning atheistic paradigm.

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[13] Lee Smolin, "Atoms of Space and Time," *Scientific American*, Sept. 2004; A. Ashtekar, V. Husain, J. Samuel, C. Rovelli, L. Smolin: "2+1 quantum gravity as a toy model for the 3+1 theory," *Classical and Quantum Gravity* 6, L185, 1989; C. Rovelli: "Loop space representation In: New perspectives in canonical gravity," A. Ashtekar Bibliopolis, Naples 1988; C. Rovelli and L. Smolin: "Knot theory and quantum gravity," *Physical Review Letters* 61, 1155, 1988; C. Rovelli, L. Smolin: "Loop space representation for quantum general relativity," *Nuclear Physics* B331, 80, 1990; A. Ashtekar, C. Rovelli, L. Smolin: "Gravitons and loops," *Physical Review* D44, 1740, 1991; A. Ashtekar, C. Rovelli: "Connections, loops and quantum general relativity," *Classical and Quantum Gravity* 9, 3, 1992; J. Iwasaki, C. Rovelli: "Gravitons from loops: non-perturbative loop-space quantum gravity contains the graviton-physics approximation," *Classical and Quantum Gravity* 11, 1653, 1994; H. Morales-Tecotl and C. Rovelli: "Loop space representation of quantum fermions and gravity," *Nuclear Physics* B 451, 325, 1995; C. Rovelli and L. Smolin: "Spin Networks and Quantum Gravity," *Physical Review* D 53, 5743, 1995; gr-qc/9505006. Lee Smolin argues that space is proportional to the area of its boundary in Planck units establishes a fundamental limitation on the nature of physical systems, called the "Bekenstein" bound. The power of this principle lies in its universality—any viable theory of quantum gravity must explain why it holds ("Three Roads to Quantum Gravity," Basic Books, 2001).

[14] Alan Kostelecký, "The Search for Relativity Violations, " *Scientific American*, September 2004, p. 96.

[15] *Ibid.*

As for whether the Planck aether is a fantasy, let's check on the late John Wheeler, one of the most respected physicists of the 20th century. He speaks of things that MacAndrew is just learning about – the Planck aether:

> The black hole, as "experimental model" for gravitational collapse, brings us back full-circle to the paradox that continually confronts us, and all science, the paradox of big bang and gravitational collapse of the Universe itself. The existence of these two levels of collapse reminds us, however, that theory gives us also what is in effect a third level of collapse, small-scale quantum fluctuations in the geometry of space taking place and being undone, all the time and everywhere.[16]

> Among all the great developments in physics since World War II, there has been no more impressive advance in theory than the analysis of the fluctuations that take place all the time and everywhere in the electromagnetic field. There has been no more brilliant triumph of experimental physics than the precision measurement of the effect of these fluctuations on the energy levels of the hydrogen atom....These developments tell us immediately that the electron in its travels in a hydrogenic atom is subject not only to the field Ze/r^2 of the nucleus, but also to a fluctuation field that has nothing directly to do with the atom, being a property of all space.[17]

In other words, the electron not only has to interact with the nucleus, but with the field of space between the nucleus and the electron, yet a field that "has nothing to do with the atom" itself, but is a property of the independent existence of something other than the atom. So, according to Wheeler, we have protons, neutrons, electrons and an undefined but experimentally proven "field" which constitutes the fabric "of all space." Wheeler goes on to explain the dimensions and magnitude of this "field...of all space...is the Planck length,"[18] which is what I have been arguing as one of the basic constituents and dimensions of the universe's granularity. He continues:

> One who had never heard of electricity, looking for evidence of this multiple connectivity of space, would *predict* electricity as [a] consequence of it. Thereupon *finding* electricity in nature, he would take this discovery as evidence that space really is multiply connected in the small. Nothing prevents our rising above the accidents of history to take the same position.[19]

> These fluctuation charges are not a property of elementary particles. The relevant scale of distances is twenty orders of magnitude less than nuclear dimensions. The

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[16] J. A. Wheeler and C. M. Patton, "Is Physics Legislated by Cosmology," p. 24.

[17] *Ibid.*, p. 24.

[18] "In a region of observation of dimension L the calculated fluctuation field is of the order, $\Delta\varepsilon \sim (hc)^{1/2}/L^2$... The consideration of principle that give one in electrodynamics the fluctuation formula [$\Delta\varepsilon \sim (hc)^{1/2}/L^2$] tell one that in geometrodynamics, in a probe region of extension L, the quantum fluctuations in the normal metric coefficients $-1, 1, 1, 1$ are of the order, $\Delta g \sim L^*/L$. Here $L^* = (hG/c^3)^{1/2} = 1.6 \times 10^{-33}$ cm is the Planck length. These fluctuations are negligible at the scale of length, L, of atoms, nuclei, and elementary particles, as the wave-induced fluctuations in the level of the ocean appear negligible to an aviator flying 10 km above it. As he comes closer, or as L diminishes, the fluctuations become more impressive. Finally, when the region of analysis is of the order of the Planck length itself, the predicted fluctuations are of the order $\delta g \sim 1$."

[19] Concluding with: "Accordingly we are led to think of space as having a kind of fluctuating foam-like structure, with everywhere positive and negative charges of order $q \sim (hc)^{1/2} \sim 10e$ continually being created and annihilated."

charges are not quantized in magnitude. The charges occur everywhere, not only where there is a particle.[20]

The view that large fluctuations go on at small distances puts physics in a new perspective. The density of mass-energy associated with a particle…is as unimportant compared to the calculated effective density of mass-energy of vacuum fluctuations down to the Planck scale of lengths…10^{94} g/cm³…as the density of a cloud, $\sim 10^{-6}$ g/cm3, is unimportant compared to the density of the sky, $\sim 10^{-3}$ g/cm³…the proper starting point in dealing with physics…is the sky, not the cloud…no theory of particles that deals only with particles will ever explain particles.[21]

So obviously, the Planck aether is not my invention. It comes from modern science, but evidently Mr. MacAndrew wasn't familiar with it until he had to read my books.

MacAndrew: Sungenis faces another difficulty: If his Planck-aether is rotating about the Earth, it would be rotating not about the Earth as a point, but about Earth's polar axis which extends indefinitely away from the Earth into space from the North and South poles. The "centrifugal gravitational field" in a rotating universe does not have "enormous values at large distances" on the axis of rotation – in fact, it is zero, no matter how far away from the Earth you go.[5]So *according to Sungenis's own idea*, the speed of light at great distances from the Earth along the polar axis would be the same as it is locally on Earth but it would be hugely greater at great distances on the equatorial plane. This idea is negated by observations, and it violates general covariance. It's a fantasy.

R. Sungenis: "violates general covariance"?? General covariance is nothing but a mathematical lashup in Einstein's General Relativity (which, unfortunately for MacAndrew, leads him right back to geocentrism – the ultimate "general covariance" result, courtesy of Albert Einstein). So once again, Mr. MacAndrew is guilty of the fallacy of *petitio principii* (using as proof what one is trying to prove).

As for the speed of light along the polar axis, this is very simply solved by the fact that the universe, besides rotating around the polar axis, has the polar axis itself rotating around the universe's center of mass, thus exerting centrifugal force on the polar axis. The farther away the polar axis is, the greater the centrifugal force. The universe has these two rotations since it keeps the universe stable. If it were rotating only in one plane, it would tend to divide. The second rotation—the polar axis rotation—stops the dividing and keeps the universe spherical. We don't see the polar rotation because the Earth maintains its position with the universe on the polar axis.

MacAndrew: Sungenis asserts confidently that his invented Planck-aether can "sustain" (whatever that means) "millions of orders of magnitude" greater tension than its tension at

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[20] "Is Physics Legislated by Cosmology?" p. 26.
[21] *Ibid.*, p. 27. In his arrival at the density of the substratum of 10^{94} g/cm³, Wheeler uses the equation $\rho \sim [(hc/L^*)/c^2]/L^{*3} \sim M^*/L^{*3} \equiv 2.2 \times 10^{-5}$ g/$(1.6 \times 10^{-33}$ cm$)^3 \sim 10^{94}$ g/cm³.

the Earth (note: not merely a factor of millions, but millions of orders of magnitude!), that it is "incompressible" at the Earth, that it can be stretched to "great dimensions" and "remain stable", but that it is "strong" and would take a "tremendous amount of centrifugal force to stretch it". His aether has "such high granularity" (whatever that means)

R. Sungenis: Let's see if we can help MacAndrew get a grasp: Wikipedia: "Granularity (also called "graininess", the quality of being grainy) is the extent to which a material or system is composed of distinguishable pieces or grains. It can either refer to the extent to which a larger entity is subdivided, or the extent to which groups of smaller indistinguishable entities have joined together to become larger distinguishable entities."

MacAndrew: ...that it doesn't "react with baryonic matter" but with "electromagnetic and gravitational activity" (see*GWW*, Vol 1, page 263).[6] How can he possibly know these things? His claims are vague, unquantified and entirely unsatisfactory to physicists, they arise without rhyme or reason, and he never explains how he has come by them. Their empirical and mathematical foundation remains a mystery. The undeniable fact is that he's just making it up. His kind of knowledge is like that of a child who just knows her imaginary friend is wearing a blue dress and has brown eyes. It's a fantasy.

R. Sungenis: Of course, since we see that Mr. MacAndrew didn't get past page 263 in his reading of GWW, he is prone to make his own straw man to beat up. If he read toward the end of Volume 1, and into Volume 2, he would have found out why I say these things. (But in MacAndrew's world it is better to jump to conclusions and name-call your opponent than read his notes).

We know that the Planck aether reacts with EM activity because we see fringe shifts in all the interferometer experiments, particularly the 1887 and 1925 Michelson experiments (something that neither SRT or GRT can answer, since the fringe shifts discredit both SRT and GRT). Fringe shifts mean that something is interacting with the light beams. In fact, the very reason the light beams move at 3×10^8 m/s is because that is the only speed allowed in the Planck medium (unless the Planck medium is altered in some way, as it is when it has more tension).

As for gravity and the Planck aether, since the density of the Planck aether is so great (10^{94}g/cm^3) it can:

(1) penetrate all baryonic matter. But since it cannot replace baryonic matter, the baryonic/Planck combination (as occurs, for example, in a typical planet) will create a huge vacuum against the pure Planck aether in space. This vacuum will attempt to compensate by pulling in any object that has less of a baryonic/Planck combination (less because it is smaller than the planet), and this is what we understand as gravity.

(2) Additionally, the Planck aether solves the gravity speed problem (Einstein limited gravity to c because of the demands of his SRT, but that slow speed for gravity simply doesn't work). In a Planck aether universe, the speed of gravity is practically unlimited.

Since the Planck aether is so dense, it can carry longitudinal waves or compression waves over the entire universe in a split second (about 10^{-11} seconds).

(3) Additionally, the Planck aether solves the "action-at-a-distance" problem of Newton's physics, as well as the problem of "entanglement." Newton had the problem that his theory of gravity required non-locality, that is, gravity had to act upon objects instantaneously that were huge distances apart. This problem is solved by the instantaneous speed of gravity allowed by a Planck aether. In "entanglement" an electron in one place has a coupling with an electron in a different place. This instantaneous communication between electrons is allowed by the Planck aether.

MacAndrew: But let's indulge the fantasy for a while. Let's temporarily suspend our disbelief and grant Sungenis his aether for a time. Let's step into his invented world and see whether, even if it existed, it would behave the way he says it would. **3 Twirling the spring:** Sungenis uses the analogy of a spring representing his Planck-aether to explain how, in his model, in which the Universe rotates around the Earth, light travels faster the further from the Earth you get. He says:

"In the Planck-ether medium of geocentrism, the speed of a transverse wave, such as light, depends on the tension between the Planck particles. The greater the centrifugal force, the greater the tension and thus the greater the speed of light. The inertial force of a rotating universe increases as the distance from the center of mass increases. Consequently, the farther from Earth a star is in a rotating universe, the faster its light can travel toward Earth, the center of the universe. By the time the light reaches the environs of Earth, however, it will be traveling at the minimum speed of 3×10^8 m/sec since the surface of the Earth is at or near the neutral point of the centrifugal force created in a rotating universe. Outside of this locale, light can travel at much greater speeds than 3×10^8 m/sec. Since that is the case, we may be looking at the explosion of supernovae precisely when they occur in deep space."

We shall not be distracted by Sungenis's last rhetorical sleight of hand, where he asserts that we could be seeing "supernovae *precisely* when they occur in deep space", a prediction which is trivially and obviously wrong for any finite speed of light.

R. Sungenis: "Sleight of hand"? No, it's just a way of showing us that God built the universe so that we will not be confused. What we see is what we get. MacAndrew, of course, wouldn't understand such a motive since he threw God out of his life a long time ago.

MacAndrew: Let's focus on his idea that if the universe is whirling around, the tension in his hypothesised aether is greater as a function of distance owing to centrifugal force, and that the greater tension with distance results in a higher speed of light according to the formula we have seen already, $v = \sqrt{(T/\mu)}$. He continues his exposition by comparing the Planck-aether to a spring: "We can grasp this phenomenon intuitively by illustrating the stretching of a metal spring. If we hit the end of an unstretched spring, the vibration will travel to the other end of the spring in a certain time and velocity. If we stretch the spring to about three times its original length, the vibration will travel proportionately faster due

to the increased tension in the spring. Likewise, if we whirl the spring around in a circle, the centrifugal force stretches the spring. Similarly, a rotating universe stretches the ether medium within it. The greater the radius of the rotation, the greater the centrifugal force, and thus the greater the tension in the ether medium. This will result in a greater speed for light traveling through that medium."[7] Before we consider the whirling spring as an analogy for the whirling aether, let's limber up our thinking muscles by considering a related but simpler case – a spring under tension and extended only by its own weight. In that case, the tension in the spring varies along its length. The greatest tension occurs at the top fixed point of the spring because the entire weight of the spring has to be supported at this point. The least tension, in fact zero tension, occurs at the very bottom end of the spring where there is no mass below to be supported, so there is no tension in the spring at this point (see Fig. 1). Let's imagine that the spring is a long chain of people, dangling head-down under gravity, holding, desperately for fear of precipitate disaster, on to each other's feet, with the feet of the guy at the top attached to a rigid platform. The tension in the ankles of the bottom dangler is his own weight – the tension in the ankles of the one at the top is his own weight plus the weight of all the others hanging below him. He'd better be the strongest of them all if they are not to plummet to their deaths. In a similar way it is clear that, for a spring hanging under its own weight, the greatest tension (and extension) is at the top next to the fixed point and the least tension (and extension) is right at the bottom at the free end. So the velocity of a transverse wave will vary along such a spring, being greatest at the top and falling to zero at the bottom.[8] OK, let's get a little more complicated and explore what happens when we whirl the spring horizontally around a fixed point. Gravity is no longer relevant but centrifugal force is. Sungenis says: "The greater the radius of the rotation, the greater the centrifugal force, and thus the greater the tension in the aether medium." This is how Sungenis concludes that the speed of light is greater away from the Earth. Is his argument correct? No. In fact, Sungenis has it exactly backwards. It's true that the case of the whirling spring is a little more complicated than that of the hanging spring. The force exerted by gravity on any element of the hanging spring is the same as every other (it's just the mass of the element times the acceleration due to gravity), but in the whirling case it also depends on the radial distance of the element from the centre (it's the mass of the element times its distance from the centre times the square of the angular speed of rotation). However – and this is the important point – the principle, which we have already explored for the hanging case, that the tension is greatest in the centre remains true for the rotating case. An element at the centre, although not experiencing a centrifugal force arising from its own rotation, has the outward force exerted by the entire spring pulling on it, whereas an element at the far end has none of the spring beyond it, no external force to pull on it other than the centrifugal force of its own rotation, and so it is not in tension. The centrifugal force acting along the spring is greatest at the end and zero in the centre, but *the tension* in the spring is greatest in the centre and zero at the end.[9] Our analogy of a chain of people works here too. What if we whirl a chain of people around? The guy at the end has no-one else's centrifugal force to pull on him. The next person in has a smaller centrifugal force acting directly on him than the one on the end, but, in addition, he has to hold on to the feet of the person on the end and is tugged by his force. And so it goes, the strong-man in the centre has little centrifugal force acting directly on him, but has the centrifugal force of everyone else in the chain pulling on him. If he lets go, the entire chain flies off. He is physically (and psychologically)

under the greatest tension. What does this mean for Sungenis's analogy? Well, if the Planck-aether is like a spring being whirled around then the tension will be greatest in the *centre*, and that is where the highest wave speed will be, where the tension is highest and the linear density is lowest, near the Earth. In fact, if his hypothesis that light is a transverse wave in the Planck-aether with a speed given by the spring-in-tension formula is correct, and that tension is caused by the centrifugal force of the rotating Planck-aether, then the speed of light would be *less* the further away from the Earth you go, the complete opposite and contradiction of his claim. 4 Going solid: A spring in tension is the analogy that Sungenis has chosen to represent his Planck-aether, but the physics of a spring is that of a one dimensional entity that vibrates in space. Presumably the aether, as Sungenis understands it (remember, Sungenis's Planck-aether is a made-up fantasy, but we're indulging it for a while), is a solid three dimensional thing, and in his mind, light is a transverse (shear) bulk wave travelling in it. So a better analogy for the Planck-aether would be a solid uniform rotating disc. Perhaps in this case, the transverse wave speed would be greater at greater radii? Sadly for Sungenis the answer is no – the greatest stress still occurs in the centre. (Stress is force per unit area and is the solid body analogue of tension – we need to consider stress rather than tension when examining the behaviour of solid bodies). This fact is well known to engineers – for example, rapidly rotating turbine blades tend to fail at the root where the stress is greatest, not at the tip. In the case of a solid rotating disc there are two stresses to consider – radial stress which is the stress acting in a direction from the centre to the periphery and hoop stress which acts around the circumference. The derivation of these stresses in a rotating solid disc is standard physics, available in many textbooks, and the results well-known. The total stress is greatest in the centre, which is where the greatest strain will also be (strain is the distortion of the material as a result of stress). Consequently, the bulk density of the rotating disc will be least in the centre.[10] The speed of shear bulk waves in a solid is given by $v = \sqrt{(m/\rho)}$ where m is the shear modulus of the material and ρ is its bulk density. It's obvious, that even with this better analogy for his aether, the physics gives results in exact contradiction to the way Sungenis would have it. As the stress and strain are tensile and greatest in the centre, so the density would be least there, and thus the velocity of transverse waves would be highest. So, according to this better analogy, as is the case with Sungenis's own spring analogy, light speed would be greatest at the Earth and would be less the further away you go, exactly the opposite of his claim.

R. Sungenis: MacAndrew is wrong because he is misconstruing the analogy of the spring. It was intended as a mental picture of how greater tension increases the speed of a vibration going through it. In other words, if we have a slightly stretched spring as opposed to a fully stretched spring, the vibration will travel faster in the fully stretched spring due to the greater tension in the spring. That is a fact. The question as to how the Planck aether stretches is not at issue here. Analogously, all I am saying is that a Planck aether that is stretched will allow light to travel faster than one that isn't stretched, according to the equation $v = \sqrt{(T/\mu)}$.

The means by which the Planck aether would be stretched is the centrifugal force from the rotation of the universe. The centrifugal force would be spread over the whole universe and it would stretch instantaneously and in every place. The father away from the center

the more is the centrifugal force and the greater the stretching of the Planck aether, which then translates to a greater speed for light, according to the equation $v = \sqrt{(T/\mu)}$.

The universe is a solid unit of Planck aether, like a bowling ball. Although the material of the bowling ball is compacted in a sphere, if we spin the bowling ball, the centrifugal force will be greatest at the rim of the bowling ball and thus the tension on the particles at the rim will be the greatest, as opposed to the particles at or near the center. In other words, when we are dealing with Planck aether we are dealing with individual particles that are independent of each other and are affected by external forces individually.

Moreover, although because of its extreme density (10^{-94}g/cm^3) the Planck aether is like a huge solid bowling ball (somewhat like a crystal), at the same time, because its granularity (10^{-33}cm) it is superfine and behaves like a superfluid, or perhaps like a super quicksand.

The extreme granularity of the Planck aether allows it to be extremely flexible. Objects from the size of electrons to stars can move through the Planck aether with no resistance, and they will move as all matter does – by wave motion. This phenomenon is why quantum mechanics finds that the proton, neutron and electron are wave/particle dualities. The wave dimension of matter is needed to move through the dense Planck medium. The leading wave of matter moving through the Planck aether is the de Broglie pilot wave. As light can move through a solid block of transparent material, analogously, solid objects can move through the Planck aether that permeates the universe.

Interestingly enough, great pressure does not necessarily inhibit movement or cause friction, but will actually help an object to move, since the pressure helps eliminate molecular action against the moving body and allows energy losses only through turbulence and wave action, provided the pressure is equally distributed. We see this in everyday life, for example, when a submarine experiences less drag and can move more freely the deeper it is submerged into the ocean. In the laboratory, it has been shown that super-cooled helium allows motion of objects through it without any detectable friction. This substance acts so peculiarly at 0.25 degrees above absolute zero that it is understood as a "new phase of matter, a 'supersolid' form of helium-4 with the extraordinary frictionless-flow properties of a superfluid."[22] As Nobel laureate in physics (1993) Robert Laughlin notes:

> The similarities between the vacuum of space and low-temperature phases of matter are legendary in physics. Not only are phases static, uniform quantum

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[22] Barbara Kennedy, "Strong New Evidence of a New, Supersolid Phase of Matter," *Science Journal*, Penn State University, Summer 2005, p. 8. Kennedy continues: "Solid helium-4 appears to behave like a superfluid when it is so cold that the laws of quantum mechanics govern its behavior…. 'We used to think that a solid could not flow, but now we have discovered that when you cool solid helium to a sufficiently low temperature it can not only flow, but it actually flows without friction….The implication of our research is that we now have to rethink what we mean by a solid'" (*ibid.*, p. 9). Additionally, at 2.2 Kelvin the helium will have no viscous drag with its rotating container; at certain speeds it will spin twice as fast as its container; and it will mysteriously penetrate through its container. Mercury has been found to have zero resistance to electrical current at 4.1 Kelvin. Sodium atoms at 435×10^{-9} Kelvin stopped the travel of light for a few milliseconds. The discovery of these reactions is based in part on the Planck, Einstein and Bose theory of heat capacity. It theorizes that near 0º Kelvin, atoms may group together under the same wavefunction to act as a single 'superatom' and is known as a Bose-Einstein condensate. See *Einstein's Other Theory: The Planck-Bose-Einstein Theory of Heat Capacity*, Donald W. Rogers, 2005, pp. 165-175.

states, but their most subtle internal motions are physically indistinguishable from elementary particles very generally. This is one of the most astonishing facts in science, and something students always find upsetting and difficult to believe. But they eventually become convinced after looking at enough experiments, for the evidence is plentiful and consistent. In fact, the more one studies the mathematical descriptions of cold phases, the more accustomed one gets to using the parallel terminologies of matter and space interchangeably. Thus instead of a phase of matter we speak of a vacuum. Instead of particles we speak of excitations. Instead of collective motions we speak of quasiparticles. The prefix "quasi" turns out to be a vestige of the historical battles over the physical meaning of these objects and conveys no meaning. In private conversations one drops the pretense and refers to the objects as particles.[23]

The "cold temperatures" that Laughlin notes is applicable to the 2.75 Kelvin temperature of the Planck aether, otherwise known as the CMB or Cosmic Microwave Radiation. The 2.75 K is the temperature needed both to keep the Planck aether stable and to allow it to perform its physical characteristics.

MacAndrew: 5 Returning to sanity: Our journey through Sungenis's fantastic world has come to an end, and we must return to humdrum reality. It's time to abandon the analogy of a whirling spring, an analogy representing the bizarre notion that light consists of transverse waves in a solid, incredibly dense Planck-aether of speculative undetectable particles.

R. Sungenis: We saw that what failed was Mr. MacAndrew's understanding of why the spring analogy was used.

MacAndrew: Let's examine other ways in which his hypothesis fails. Across much of his writing Sungenis and his supporters repeatedly fall into what I call the Great Inconsistency, appealing to the conclusions of General Relativity while vehemently rejecting them (see <u>Here Comes the Sun</u>, p.17, and <u>There He Goes Again</u>, p.2).

R. Sungenis: Let's get some perspective. Mr. MacAndrew knows that the very science he believes in, namely, General Relativity supports geocentrism, but he is too dishonest to give this information to the world. He would rather pretend it doesn't exist and instead accuse me of "inconsistency" because I point out to the world what he won't. His goal is to take the focus off his own sleight of hand and put the onus on me. But the truth is, he is very embarrassed that Einstein supported geocentrism.

Nevertheless, let me say once again so that Mr. MacAndrew can finally stop misrepresenting my appeal to GRT: I don't appeal to GRT because I believe in it, but because Mr. MacAndrew believes in it! What better way to expose the fallacy of your opponent's position than to point out that his system denies him the very thing he wants to achieve – to deny geocentrism. As St. James says in 1:23-24: "For if anyone is a hearer of the

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[23] Robert B. Laughlin, *A Different Universe*, p. 105.

word and not a doer, he is like a man who observes his natural face in a mirror; for he observes himself and goes away and at once forgets what he was like."

MacAndrew: The section from GWW that we are reviewing is no exception. He quotes W G V Rosser's review of General Relativity approvingly in spite of the fact that he rejects the theory: "As Rosser notes "light can assume ANY NUMERICAL VALUE depending on the strength of the…centrifugal gravitational field" which has "enormous values at large distances." Sungenis is more interested in the rhetorical capital he can make from Rosser's statements than he is in adopting a self-consistent case for geocentrism.

R. Sungenis: MacAndrew is a guy who lives in a glass house (since his own GRT believes in geocentrism) but he keeps throwing stones at me for pointing this out to the world. He then has the audacity to say that we are using GRT because our own theory is not "self-consistent." Let's set the record straight. We don't believe in GRT. The reason is because it is not consistent. SRT contradicts GRT and GRT contradicts Quantum Mechanics, so we don't dare use any of them to support geocentrism. Quoting John Wheeler again, here is what he has to say regarding the bankrupt theories of SRT and GRT:

> The [Heisenberg] uncertainty principle [of Quantum Mechanics] thus deprives one of any way whatsoever to predict, or even to give meaning to, "the deterministic classical history of space evolving in time." No prediction of spacetime, therefore no meaning for spacetime, is the verdict of the quantum principle. That object which is central to all of classical general relativity, the four-dimensional spacetime geometry, simply does not exist, except in a classical approximation.[24]

So what other physics, from the world's perspective, do we have that does what Einstein's GRT did for geocentrism? Lo and behold, Newton's physics does the same thing for geocentrism that Einstein did – he makes it viable. Of course, Newton's admission has been hidden from us for a long time, but it was finally released. As Steven Weinberg puts it in his latest book, *To Explain the World*:

> If we were to adopt a frame of reference like Tycho's in which the Earth is at rest, then the distant galaxies would seem to be executing circular turns once a year, and in general relativity this enormous motion would create forces akin to gravitation, which would act on the Sun and planets and give them the motions of the Tychonic theory. Newton seems to have had a hint of this. In an unpublished 'Proposition 43' that did not make it into the *Principia*, Newton acknowledges that Tycho's theory could be true if some other force besides ordinary gravitation acted on the Sun and planets.[25]

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[24] *Gravitation*, 1973, 25th print, pp. 1182-83. That two diametrically opposed theories (General Relativity and Quantum Mechanics) can both hold center stage in physics today, reveals like nothing else the shaky foundation upon which modern cosmology is built. On the one hand, Misner states that "the standard Big-Bang model of the universe [is] predicted by General Relativity," but admits "General Relativity is incapable of projecting backward through the singularity to say what 'preceded'" the Big Bang, "and, unfortunately, no problem is farther from solution," since General Relativity breaks down at that point (*ibid.*, p. 770).

[25] Steven Weinberg, *To Explain the World: The Discovery of Modern Science*, HarperCollins, 2015, pp. 251-252.

Here is what he said in Proposition 43:

> In order for the Earth to be at rest in the center of the system of the Sun, Planets, and Comets, there is required both universal gravity and another force in addition that acts on all bodies equally according to the quantity of matter in each of them and is equal and opposite to the accelerative gravity with which the Earth tends to the Sun…
>
> Since this force is equal and opposite to its gravity toward the Sun, the Earth can truly remain in equilibrium between these two forces and be at rest. *And thus celestial bodies can move around the Earth at rest, as in the Tychonic system.*[26]

As we see, all systems of physics today support geocentrism. It's only people like MacAndrew who have an agenda to keep it under wraps since it speaks highly of the existence of God that he has decided to hide from the world and to call people like me who point out the truth as those who believe in "fantasy." The fantasy is all MacAndrew's.

MacAndrew: He would have his readers focus on the notion that the "[speed of] light can assume *any numerical value*" (in other words, in his rhetoric, any value that *he* needs it to have – his questioner on the Facebook page did indeed succumb to this interpretation), and gloss over the proviso "depending on the strength of the gravitational field".

R. Sungenis: Here is a classic case of MacAndrew's shell game of misdirection. Here we see a noted physicist, G. V. Rosser, who believes in and defends General Relativity but says precisely the same thing I tried to say about centrifugal force in a rotating universe, namely, that such an increase in centrifugal force will allow light to exceed 3×10^8 m/sec, but all MacAndrew can do is call it "rhetoric." Instead of dealing directly with Rosser's conclusion, MacAndrew tries to hide the issue by a feeble attempt to separate centrifugal force from gravitational field. Either MacAndrew misunderstands what Rosser said or he is deliberately misdirecting the audience. In either case, MacAndrew doesn't like the conclusion that Rosser reached, so he has to slice and dice him in an attempt to change the meaning.

So let's take a closer look at what Rosser said. I quote again from page 460.

> "If gravitational fields are present the velocities of either material bodies or of light can assume any numerical value depending on the strength of the gravitational

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[26] Latin: Ut Terra quiescat in centro Systematis Solis Planetarum & Cometarum, requiritur et gravitas universalis, et alia insuper vis quae agit in omnia coropora aequaliter pro quantitate materiae in ipsis et aequalis est gravitati acceleratrici qua Terra tendit in Solem, eique contraria est, tendendo secundum lineas parallelas in plagam eandem cum linea quae ducitur a centro Solis ad centrum Terrae...Nam talis vis in corpora omnia aequaliter & secundum lineas parallelas agendo situm eorum inter se non mutat sed sinit corpora eodem modo per vim gravitatis universalis inter se moveri, ac si non ageret in eadem. Terra vero, cum haec vis gravitati ejus in Solem aequalis sit & contraria, in aequilibrio inter has duas vires manere potest et quiescere. Et sic corpora caelestia circa Terram quiescentem moveri possunt ut in Systemate Tychonico.

field. If one considers the rotating roundabout [Earth] as being at rest, **the centrifugal gravitational field** assumes enormous values at large distances, and it is consistent with the theory of general relativity for the velocities of distant bodies to exceed 3 x 10^8 m/sec under these conditions."

Notice the words "centrifugal gravitational field." In other words, Rosser is not talking about a normal gravitational field that is exhibited by celestial bodies (e.g., the stars have mass and therefore have gravity) but of CENTRIFUGAL gravitational force, that is, a gravity field generated by centrifugal force, not celestial bodies. This is precisely why Rosser then goes on to say "assumes enormous values at large distances," since centrifugal force increases the farther the radius from the center of the system. It is just the opposite with gravity from celestial bodies. The greater the distance from the celestial body the less the gravitational force. I suggest Mr. MacAndrew go back and study the physics of GRT.

Next we will see Mr. MacAndrew take our focus off the main issue by going into a litany of irrelevant issues.

MacAndrew: Sungenis hides or is ignorant of the fact that the gravitational field is weak in a photon's path from a distant star to the Earth. In the vast reaches of intergalactic space it is very, very much weaker than the gravitational field of the Sun at the Earth. It is somewhat stronger near massive galaxy clusters but only enough to create small perturbations in the photon's path. It doesn't affect the propagation of the photon to anywhere near the extent that Sungenis suggests.

R. Sungenis: Another red herring from MacAndrew. It is not that I "hide or am ignorant of the fact that the gravitational field is weak in a photon's path from a distant star to the Earth," but that it is totally irrelevant to the issue! We are dealing with centrifugal gravitational fields not a "gravitational field…from a distant star to Earth."

MacAndrew: How do we know this? We know because we can *observe* the effect of gravitational fields on the light from stars and on the CMB, which causes the light from a single distant event to be deflected and so to appear at slightly different times in slightly different locations (an effect known as gravitational lensing) and to be red- or blue-shifted as it falls into or climbs out of gravitational wells near to large masses such as galaxy clusters (an effect known as the Integrated Sachs-Wolfe effect). Astrophysicists can quantify the size of these effects and deduce the magnitude of the gravitational field along the path of the photon from the star to the Earth – these fields are strong enough to change the arrival time of light from a distant supernova which is nine billion light years away by a few tens of years, but not to change it from 9 billion years to 6,000 years.[11]

R. Sungenis: Although this issue is totally irrelevant and is MacAndrew's red herring, let me say that I deal in detail with this issue of "gravitational lensing" in GWW, Volume II, in the Appendix 2 with the title: Gravitational Lensing: Real or Imagined?" Suffice it to say that it is "imagined." I'll leave it as an Appendix to this response to MacAndrew.

MacAndrew: And how about Sungenis's fundamental idea that light consists of *mechanical* transverse waves in his aether, with the speed of light determined by the spring-in-tension expression for wave speed, $v = \sqrt{(T/\mu)}$? This idea is an unnecessary non-starter because we have known since 1865 that light is an *electromagnetic* phenomenon and that the speed of light in a vacuum can be derived simply from two electromagnetic constants that were accurately measured in the 1850s. The two constants in question are the permittivity (ε_0) and permeability (μ_0) of free space[12]. In 1865 James Clerk Maxwell published his seminal paper on electromagnetism *On Physical Lines of Force*, in which he combined the laws of electricity and magnetism into a single unified theory and laid out the equations which describe electromagnetism. His fundamental formulation is the basis for all physics that involves electrical or magnetic phenomena, including the propagation of light. The speed of light was derived directly from the two constants referred to above which appear in Maxwell's equations and which had previously been measured: $c = 1/\sqrt{(\varepsilon_0\mu_0)}$. This equation for the speed of light based on the measured electromagnetic constants gives a value equal to the directly measured speed of light, and confirmed the hypothesis that light is an electromagnetic phenomenon. In addition to independent measurements of the two constants, an experiment to measure the ratio $1/\sqrt{(\varepsilon_0\mu_0)}$ directly in an electromagnetic laboratory experiment in 1855 [13] yielded a value for c very close to the measured speed of light. So, Sungenis's naïve attempt to create an aether-based mechanical model for the propagation of light not only fails to predict what he wants it to predict, but it is anachronistic, wrong-headed and doomed to failure. It could only have been proposed by someone for whom the physics of electromagnetism and Maxwell's equations is a deep and abiding mystery.

R. Sungenis: Let's see who is naïve. Maxwell's equations were developed within his belief of the existence of an aether. Everyone knows it, but somehow Mr. MacAndrew fails to enlighten his audience. Because of Maxwell's belief in aether, that means his value for c was not absolute but depended on the constitution and or velocity of the aether through which the light traveled. If the aether changed, then so did the speed of light.

Second, Maxwell did not, as MacAndrew claims, "combine the laws of electricity and magnetism into a single unified theory." It was Einstein who tried to make Maxwell's equations into a "single unified theory," but failed to do so because his SRT was an effect without a cause. Maxwell had two equations that could not be unified. He formulated one equation for a magnet going around an electric charge, and another equation for an electric charge going around a magnet. He had to do so because he COULD NOT unify them into one equation representing one phenomenon. Both equations were different and both produced different results.

Here's the key: Maxwell's two different equations showed that the universe was not relative but absolute. Einstein didn't like the absoluteness so he tried to make them relative by combining the two equations into one, but he failed. And since Einstein took away Maxwell's aether in order to answer Michelson's 1887 experiment so that Einstein could make it appear that the Earth was moving, he had no choice but to say that light was a combination of "electromagnetism" that supposedly made its own wave without aether.

But we all know there can be no wave unless the thing being propagated has a medium in which to propagate and make a wave.

MacAndrew: 6 Conclusion: We have seen that Sungenis's Planck-aether medium of geocentrism is an undetectable fantasy that exists only in his imagination.

R. Sungenis: We have seen many physicists state that a Planck-aether is the answer to many of the problems in science today, and we have detected its existence in the fringe-shifts of the interferometer experiments.

MacAndrew: He plucks various propositions about its properties out of thin air and asserts them with bold but utterly misplaced confidence.

R. Sungenis: Material objects can only become vaguely aware of its existence on extremely large scales (of the order of the size of the universe) and on extremely small scales (of the order of sub-nuclear particles). None of these phenomena are new, all have been noted before in the scientific literature. I suggest Mr. MacAndrew go read them. The Planck aether brings together many of the physical constants that science lives by into a coherent whole, as well as answer things like action-at-a-distance, the speed of gravity, entanglement, and the speed of light.

MacAndrew: He states that light is a transverse wave in his invented medium and that its speed is determined by the tension between the hypothetical particles that make up the medium. He offers the analogy of a rotating spring to explain how the tension in the spring will result in the wave speed being greater away from the centre of rotation, and, by analogy, how the tension in the rotating aether will result in the speed of light being greater away from the Earth. We have seen that he gets the physics exactly backwards, and that the tension and thus the wave speed would be greatest at the centre, which would make the speed of light, according to his own idea, greatest at the Earth and less the further away you go.

R. Sungenis: What we have seen is that MacAndrew misunderstood the purpose of the spring analogy.

MacAndrew: Even in the case of a better analogy for Sungenis's solid Planck-aether, a solid rotating disc, we have seen how the speed of transverse waves is greatest in the centre and less the further from the centre you go.

R. Sungenis: In actuality, the Planck aether is not a solid rotating disc but, because of its supergranularity, can be thought of as a super flexible solid that has properties of a liquid, giving its constituent parts an independence from each other that can then be affected differently from external inertial forces.

MacAndrew: So Sungenis's own model of light propagation gives results exactly opposite to what he asserts and what he wants them to be. And this discussion of rotating springs and discs, although entertaining and educational (particularly for Sungenis himself), is

moot because light is not a transverse mechanical wave in a fantasy medium, but an electromagnetic phenomenon. The wave nature of light falls naturally out of Maxwell's well-validated electromagnetic theory and the speed of light is related to two fundamental physical constants of electricity and magnetism measured in the 1800s.

R. Sungenis: We saw how MacAndrew totally misrepresents Maxwell's theory and his equations, and has no evidence that there is no aether, but every indication from the interferometer experiments that aether exists. Admitting so, of course, would discredit his mentor, Albert Einstein, and blow away the house of cards that MacAndrew has built.

Appendix 2: Gravitational Lensing: Real or Imagined?

Among other things, gravitational lensing is proposed by modern cosmology as evidence for the existence of Dark Matter.
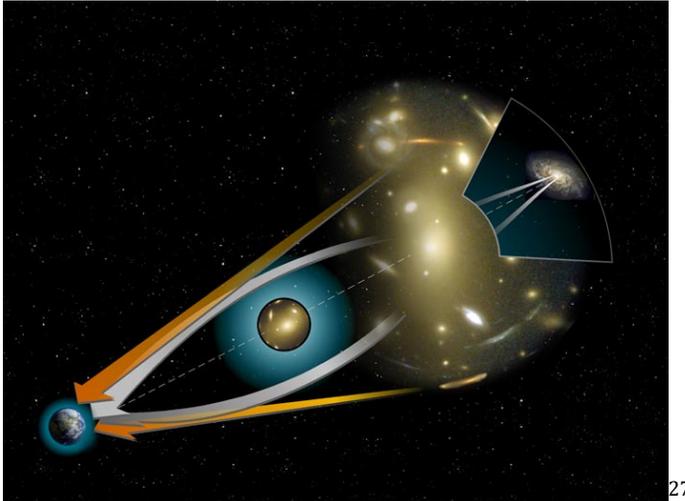
One source states:

"A gravitational lens is formed when the light from a very distant, bright source (such as a quasar) is "bent" around a massive object (such as a cluster of galaxies) between the source object and the observer. The process is known as gravitational lensing. Dark matter affects galaxy clusters as well. X-ray measurements of hot intracluster gas correspond closely to Zwicky's observations of mass-to-light ratios for large clusters of nearly 10 to 1. Many of the experiments of the Chandra X-ray Observatory use this technique to independently determine the mass of clusters. The galaxy cluster Abell 2029 is composed of thousands of galaxies enveloped in a cloud of hot gas, and an amount of dark matter equivalent to more than 1014 Suns. At the center of this cluster is an enormous, elliptically shaped galaxy that is thought to have been formed from the mergers of many smaller galaxies. The measured orbital velocities of galaxies within galactic clusters have been found to be consistent with dark matter observations. Another important tool for future dark matter observations is gravitational lensing. Lensing relies on the effects of

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[27] Caption from Wikipedia states: "Bending light around a massive object from a distant source. The orange arrows show the apparent position of the background source. The white arrows show the path of the light from the true position of the source."

general relativity to predict masses without relying on dynamics, and so is a completely independent means of measuring the dark matter."[28]

A more general summation of gravitational lensing states:

"A gravitational lens refers to a distribution of matter (such as a cluster of galaxies) between a distant source (a background galaxy) and an observer, that is capable of bending (lensing) the light from the source, as it travels towards the observer. This effect is known as gravitational lensing and is one of the predictions of Albert Einstein's General Theory of Relativity. Although Orest Chwolson is credited as being the first to discuss the effect in print in 1924, the effect is more commonly associated with Einstein, who published a more famous article on the subject in 1936. Fritz Zwicky posited in 1937 that the effect could allow galaxy clusters to act as gravitational lenses. It was not until 1979 that this effect was confirmed by observation of the so-called "Twin QSO" SBS 0957+561. Spacetime around a massive object (such as a galaxy cluster or a black hole) is curved, and as a result light rays from a background source (such as a galaxy) propagating through spacetime are bent. The lensing effect can magnify and distort the image of the background source. Unlike an optical lens, maximum 'bending' occurs closest to, and minimum 'bending' furthest from, the center of a gravitational lens. Consequently, a gravitational lens has no single focal point, but a focal line instead. If the (light) source, the massive lensing object, and the observer lie in a straight line, the original light source will appear as a ring around the massive lensing object. If there is any misalignment the observer will see an arc segment instead. This phenomenon was first mentioned in 1924 by the St. Petersburg physicist Orest Chwolson,] and quantified by Albert Einstein in 1936. It is usually referred to in the literature as an Einstein ring, since Chwolson did not concern himself with the flux or radius of the ring image. More commonly, where the lensing mass is complex (such as galaxy groups and clusters) and does not cause a spherical distortion of space–time, the source will resemble partial arcs scattered around the lens. The observer may then see multiple distorted images of the same source; the number and shape of these depending upon the relative positions of the source, lens, and observer, and the shape of the gravitational well of the lensing object."[29]

Problems with the gravitational lens thesis begin at the foundation of modern cosmology.[30] Besides the fact that it is built on an unproven premise that redshift indicates distance (a

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[28] http://en.wikipedia.org/wiki/Dark_matter
[29] http://en.wikipedia.org/wiki/Gravitational_lens.
[30] Our thanks to Miles Mathis for his critique of gravitational lensing, much of which we include in our appendix. In his conclusion, Mr. Mathis states: "Prima facie, the hypothesis is weak, and the more one studies the examples, the weaker it gets. The theory is never defended in a cogent manner, it is simply asserted, and all anomalies are ignored. The Twin Quasar and Einstein's Cross are not strong examples, but every page on gravitational lensing leads with them. This is itself a tip-off, for if

fact that even Hubble admitted in the early stages of his observational findings (and which has been confirmed by Halton Arp's discoveries that high redshift quasars are connected to and thus are the same distance from us as low redshift galaxies and therefore the latter cannot serve as "gravitational lenses" for the former), the whole idea that light is bent by gravity in the manner dictated by the General Theory of Relativity is unproven as well.[31] Hence, when gravitational lensing is based on "Twin QSO SBS 0957+561," which is said to have a redshift of 1.41 and is thus 8.7 billion light years from Earth, whereas the galaxy that is said to be its gravitational lense has a red shift of 0.355 and is 3.7 billion light years from Earth, we must take these statements with a grain of salt.

We must also ask the basic question about gravitational lensing itself. The theory states that because there is a light source behind every galaxy, then that light source should be bent before it reaches our telescopes on Earth. Since every observable galaxy has behind it a source of light, this necessarily means that we should see light being bent around every galaxy in the observable universe. This would result in the sky being filled with duplicate images of these distant light sources and present us with an even more dire version of Olber's paradox. In the end, the gravitational lensing theory suffers from an acute selection bias. Despite these anomalies, we will examine the claims granting for the sake of argument that the foundations are correct.

The Wikipedia source for the Twin Quasar states: "The lensing galaxy with apparent dimension of 0.42 × 0.22 arcminutes lies almost in line with the B image, lying 1 arcsecond off," and is identified as "YGKOW G1 (sometimes called G1 or Q0957+561 G1), is a giant elliptical (type cD) lying within a cluster of galaxies that also contribute to the lensing." As such, the first question is how the lensing galaxy could shift the B image by one arcsecond. The center of mass for the galaxy would need to be off-center by a significant amount, especially since YGKOW G1 is an elliptical galaxy which are known to be very smooth, much more than spiral galaxies in which mass congregates in the arms. Some have noted this problem and answer it by positing that globular clusters help in the lensing. But this solution, of course, only admits to the problem but does not possess proof of its answer since no globular clusters have been found.

Twin Quasar 0957 + 561

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stronger examples existed we would not need to hear of the weak examples….This is how the standard model operates, on all questions. There is no possible defense of its nebulous hypotheses, so its only hope it to reject announcements and papers, to browbeat anyone who sits still for a moment, and to pre-empt discussion by a constant professional patter of propaganda" (milesmathis.com/lens.html).

[31] See Edward H. Dowdye, Jr. "The Shapiro Delay: A Frequency Dependent Transit-Time Effect," Proceedings of the National Philosophy Alliance, July 2011, http://www.worldnpa.org/site/abstract/?abstractid=6105&subpage=pdf.
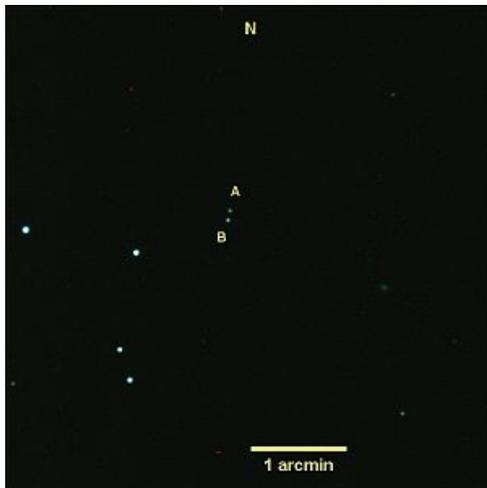
Additionally, an elliptical galaxy would not likely produce a double image (as in the above photography) but a more diffuse circular images since the quasar light is emitted in spherical dimensions. That an elliptical galaxy could magnify the quasar light so precisely as to project two distinct images on Earth is quite an unlikely scenario, especially since the quasar is said to be five billion light years from the lensing galaxy. Since the galaxy is said to be 3.7 billion light years from Earth, this would translate the 1 arcsecond angle of bending to about 18,000 light years, which means that the quasar light is passing by the lensing galaxy at a distance of 18,000 light years. That's quite a stretch, since we know that even star light that passes near the sun is bent only near the surface of the sun.

There is also a problem with how images A and B of the Twin Quasar are situated with the lensing galaxy. A and B are about 6 arcseconds apart and the lensing galaxy is about 1 or 2 arcseconds in width between A and B, which leaves about 3 or 4 arcseconds that image A or B lies from the edge of the lensing galaxy. Since for every arcsecond there is 18,000 light years of distance, then 3 arcseconds would be 54,000 light years and 4 arcsecond would be 72,000 light years that either A or B is from the edge of the galaxy. Bending of light simply cannot occur that far out unless, of course, one abandons both Newtonian and Einsteinian gravity theory.

The same Wikipedia article offers "Einstein's Cross" as another example of gravitational lensing. The caption underneath the picture says: "In the formation known as Einstein's Cross, four images of the same distant quasar appear around a foreground galaxy due to strong gravitational lensing." Similar to the images of the "Twin Quasar," the four images of Einstein's Cross are off center. This means that the lensing galaxy is not in the center of the composite image. In fact, the lensing galaxy's center of mass would need to be quite a distance to the left of the galaxy in order to produce the left-weighted position of the upper and lower images. Additionally, in order to produce four distinct images surrounding the center image, the lensing galaxy would at least need to be spherical and at best cubical, but

even then we would expect to see some kind of arcing, not to mention at least some images produced in the four corners, giving eight images in all. Rather, we see four distinct images in the vertical and horizontal positions but nothing in the corners except small points of light. The four images themselves are circular and undiffused, thus showing that they are not under the influence of a curved gravitational field at all. An attempted explanation of this anomaly was given at physicsforums.com:

Einstein's Cross
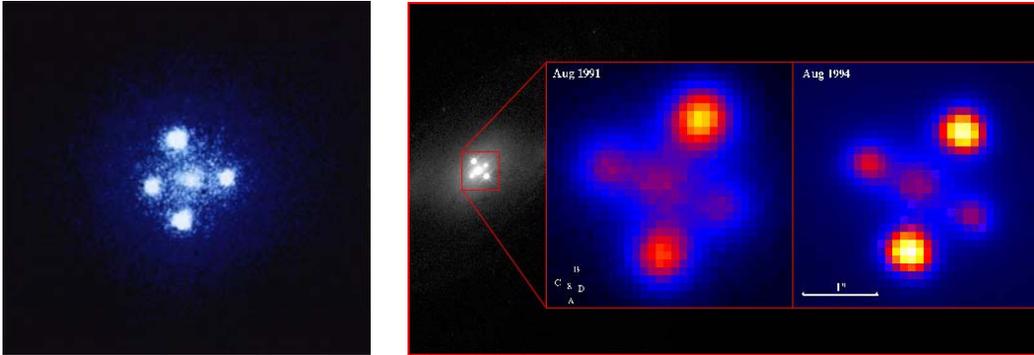
A: Tell me if I've got this right....The light from a distant quasar is bent around a more nearby galaxy, which is acting like a lens producing multible images of the quasar... correct? What's up with this ? Is the lensing galaxy rectangular? Why is the "lensing effect" producing four distinct images and not some distorted circular patterns?

B: It's not rectangular, the lining is just that good, it is an oddity, but one that sheds alot of light, no pun intended, on gravitational lensing.

A: The lining could be perfect and the lensing effect still shouldn't look like that....If the lensing object is spherical it should bend the light from an object behind it equaly in every direction, which will create a "circle of light" around the lensing object, not four distinct copies in a crossformation. Am I mistaken?

B: You took my meaning of lining wrong, its not a straight line, the quasar in the back is off alittle bit, which creates the four points. Actually the light is bent spherecly, [sic] but due to the alignment, it peaks at four points, and the other stuff gets lost in space. That is it is so small it doesn't show up, and if you increase the exposure time, the galaxy in front will saturate the image.

A: Ok, I see... thnx![32]

Mathis comments:

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[32] http://www.physicsforums.com/showthread.php?t=1375

For some reason our forum member is satisfied with that terrible answer: members who argue with the experts are routinely shunned and then banned, so it is best not to make much noise. But let us look at the answer here. The light is bent spherically, but peaks at four points: that is not an explanation, that is a statement. "We see four points, therefore the image peaks at four points." Zero content. Even if the image did peak at four points, for some physical reason not mentioned here, the image would not be expected to "unpeak" right at the top and bottom edge of the images we see. We don't see "peaks," we see spikes surrounded by zero amplitudes. In fact, a quasar "off a bit" from center would not create peaks, much less spikes. It would create a bent image on one side only, or at the most two sides. It could not create four images, since it would have to create unequal bending in order to do so. To make this even sillier, our expert says, "the other stuff gets lost in space." The light in the four corners is so dim, it gets soaked up by the vacuum, I guess, by some mechanism of light destruction so fundamental it doesn't have to be mentioned. Equally silly is the idea that "the galaxy in front will saturate the image." The galaxy in front is not as bright as the quasars, but if we give it time, it will become brighter than them and fill up all the dark spots, relieving us of our need to look at them and ask questions about them.

Further anomalies of Einstein's Cross for the gravitational lensing theory were noted by others. One site states:

Is the Einstein Cross a gravitational lens (a galaxy-sized fun-house mirror), or is it a redshift anomaly, proving that the "redshift-equals-distance" assumption is fatally flawed?

In the mid-1980's, astronomers discovered these four quasars, with redshifts about $z = 1.7$, buried deep in the heart of a galaxy with a low redshift of $z = .04$. (The central spot in this image is not the whole galaxy, but only the brightest part of the galaxy's nucleus.) This could have been seen as a crucial verification of Halton Arp's discordant redshift associations. It could have been proof that the redshift-equals-distance relationship is fatally flawed. Instead, Einstein's space-warping principle was invoked, and astronomers announced they had discovered a single distant quasar split into four images by the gravity of the foreground galaxy. A galaxy-sized fun-house mirror!

But how well does the image fit the theory? Einstein predicted that light from a distant object that was gravitationally warped around a massive foreground object would form arcs or even a full circle. Here we see four bright spots and no ring-like elongations. In fact, all four of the bright spots are elongated in the wrong direction: they stretch toward the galaxy center.

More observations were undertaken. Using the Hubble Space Telescope, a friend of Arp's documented that quasar D (right side of photo) is physically connected to the nucleus of the galaxy. Later, a high redshift connection was discovered between quasars A (bottom) and B (top) which passes in front of the connection between the nucleus and quasar D. But these observations went unnoticed: the journal which usually prints results from the Hubble Space Telescope rejected this announcement twice.

Mathematical analysis, too, casts doubt on the gravitational lens theory. The faint foreground galaxy would need to be much bigger and brighter in order to accomplish this lensing feat: In fact, it would have to be 2 magnitudes brighter than "conventional quasars," the brightest objects known.

These two photos show brightness changes observed over a period of three years. The lensing explanation is that the warping of the light varies when individual stars pass in front of the quasar. Arp's explanation is that the galaxy has ejected four quasars, which are growing brighter and moving farther from the nucleus as they age.[33]

Mathis concludes:

Both rings and distinct images can be explained by refraction, since matter can be cast off either in jets or in haloes. Haloes will give us arcs of refraction and jets will give us a distinct area of refraction. But lensing cannot explain the lack of arcing we see in Einstein's cross, since galaxies cannot create square lenses.

So you can immediately see that we don't need an esoteric explanation of bending, when we already have a prosaic explanation. Even before I showed the logical inconsistencies of the theory of lensing, it was much more likely and plausible that rings and arcs and multiple images were caused by refraction than by gravitational bending. Astronomers assigned the phenomena to gravity only because they were already in search of such "proofs." They needed the bending to be caused by gravity, so they ignored the more likely explanations. As in so many other instances, they let the theory determine the data. Instead of having data, and then developing a theory to contain it, they had a theory, and then went in search of data to support it. The science of the hysteron proteron.

But now we can see that logic supports refraction, and refutes lensing. This is because refraction can explain the very limited instances of bending we do get. Refraction requires that we have an area of refracting medium, of the right

[33] "The Einstein Cross," Jul 26, 2004, http://www.thunderbolts.info/tpod /2004/arch/040726nebula.htm

refraction index, at the right distance, and at the right angle, in order to send an image to us. This would be expected to be a fairly rare occurrence, even at universal scales.[34]

Edward Dowdye, former NASA engineer, adds these observations to the issue:

The evidence is all over the celestial sky and the background images of all those lensing galaxies have absolutely nothing at all to do with Gravitational lensing of General Relativity. The modern high resolution telescopy has light amplification powers and is able to view very weak signals and faint images (of few photons per count) making visible what was not visible 50 years ago because the technology was not there yet. What is seen in most cases is the scattering of the light coming from the far background regions or galaxies emitting light to regions of space where there in little or no light at all (complete blackness). The scattered light from the background sources are responsible for the false alarms or the false images. These images are incorrectly interpreted as having something to do with gravitational lensing or light bending effects of General Relativity. All you have to do is change the wavelength or frequency of the observed waves or the images, and then the images will look entirely different. All the features will totally disappear and the feature will no longer be visible in the infrared and the ultraviolet. This is something the mainstream does not want to talk about…these images do not have there counterparts in other regions of the spectrum, namely, the infrared and the ultraviolet. If lensing or light bending of General Relativity is correct then it should work in the infrared as well as in the ultraviolet. The GR effect is supposed to be totally independent of the frequency.[35]
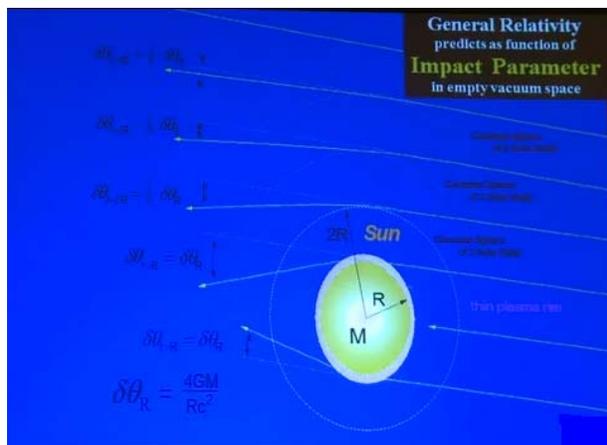
In a paper for the *American Physical Society*, Dowdye states in his abstract:

[34] www.milesmathis.com/lens.html
[35] Private email of July 2, 2012. See Dr. Dowdye's Lecture at http:// alhadathnews.com/tube/the-failed-attempts-to-detect-macro-lensing-edward-dowdye-jr-md19m9mHx8GmyN0.html

Significant findings show that one of the most misunderstood of all observed astrophysical phenomena is that of gravitational lensing. The Mathematical Physics of Gauss' law of gravity, the analogy of the Gauss' law of charges is directly applicable to the gravitational light bending at the sun. Astrophysical observations are consistent with an indirect interaction involving a plasma medium, not a direct interaction in the empty vacuum space above the rim. A century of observations reveal that gravitational light bending effects have been noted to occur predominantly at the thin plasma rim of the sun, not in the vacuum space a fraction of a solar radius above the rim. Light bending as predicted by General Relativity should be an easily detectable at analytical Gaussian spherical surfaces of various radii; at 2R, 3R, 4R and 5R respectively, where R is the radius of the sun. The observational evidence is clearly inconsistent with the light bending rule of General Relativity since this vacuum space and the solar plasma rim are exposed to virtually the same field.[36]

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[36] "No Gravitational Lensing in Vacuum Space a fraction of a Solar Radius above Solar Rim," *Bulletin of the American Physical Society*, 42nd Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics, Volume 56, Number 5, June 13–17, 2011 (http://meetings.aps.org/Meeting/DAMOP11/ Event/147260); http://www.24-7pressrelease.com/view_press_release.php?rID= 185702; See also "Gravitational Lensing in Empty Vacuum Space Does Not Take Place," *Proceedings of the NPA*, College Park, MD, 2011.