Tim Thompson – A Rebuttal

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In 2001 Tim Thompson wrote a 9300 word critique of certain points I first mentioned on my website and later detailed in my book, *The Electric Sky* . This critique is filled with misinterpretations, errors of understanding and distortions. It also overflows with gratuitous *ad hominem* remarks. In some circles his piece has been touted as an 'authoritative refutation' of my work. On the contrary, close examination reveals it to be merely an attempt to evade facts and ideas that challenge his personal belief system.[1] Dr Marcello Truzzi, co-founder of CSICOP, coined the term *pseudoskepticism* to denote what is becoming an increasingly common form of scientific fundamentalism and vigilantism.

Thompson adopts the stance of the pseudoskeptic, one of "those who ***shout*** their objections but don't take proper note of what is going on." [2] Since there is not room on this single page to present all the evidence supporting Plasma Cosmology or the Electric Sun hypothesis, I will restrict myself here to dissecting Thompson's arguments point by point. For a full supportive exposition of the concepts and hypotheses I believe to be important, see Alfvén's *Cosmic Plasma,* Thornhill & Talbott's *The Electric Universe*, and my book, *The Electric Sky*. I also suggest http://www.thunderbolts.info/ as a prime and always topical source of information. Now let me address Thompson's points in the order in which he makes them:

Missing Solar Neutrinos

(1) Thompson says, *"…scientists have found that they can observe the fully expected flux of neutrinos from proton-proton (p-p) fusion*." This is incorrect. The fusion reaction hypothesized by the standard solar model to be occurring inside the Sun's core must emit a flood of ***electron*** neutrinos. Although the ***total*** observed neutrino flux (of all types of neutrino) may approximate the required level for electron neutrinos, a sufficient flux of these crucial electron neutrinos can only be inferred ***if*** it is shown that they (e-neutrinos) can 'oscillate' into different types of neutrinos (types which were not measured). The announcement made by the Sudbury Neutrino Observatory (SNO) that "*the SNO detector has the capability to determine whether solar neutrinos are changing their type en route to Earth*" is false on its face. ***There is no way that measurements made at only one end (here on Earth) of a transmission channel (that stretches from the Sun's center to Earth) can reveal changes that occur farther up the channel (say, within the Sun itself, or near Mercury or Venus).***

Consider a freight train that runs from New York to Chicago. We live in Chicago and are only able to observe the train as it arrives in

Chicago. It pulls in with 4 freight cars, 2 tank cars, and 1 flat car. How is it possible, no matter how sophisticated our method of observation, for us to make any conclusions whatever about whether freight cars, tank cars, or flat cars have been added to or subtracted from the train at, say, Cleveland? Moreover, how is it possible to say that freight cars have turned into tank cars or flat cars along the route somewhere?

The results of another more recent neutrino experiment, Fermilab's MiniBooNE experiment, can best be summarized by the lab's own statement, "*When the MiniBooNE collaboration opened the box and 'unblinded' its data less than three weeks ago, the telltale oscillation signature was absent*[3]." Admittedly, the oscillation in question in this experiment involved so-called 'sterile neutrinos' and was not directly applicable to the question of electron-neutrino into muon-neutrino transformation. None the less, it does not state that any kinds of neutrinos were seen to 'oscillate' into any different type. At this writing (April 2007), therefore, the 'missing neutrino' question still remains a very open question despite Thompson's statement that the neutrino deficit problem has been completely resolved.

(2) Thompson states, "Scott, on the other hand, would skip the bother of verifying his results, and jump to the instantaneous conclusion that all of known physics must be wrong and must be replaced. That would be both illogical and unreasonable." It is one of the ploys of pseudoskepticism to assert offhandedly that the proposed explanation violates some law of physics. To assert "all of known physics must be wrong" is a symptom of panic. This is his only answer to my statement of fact that astrophysicists have never given close and careful examination to any alternative energy source for the Sun since Eddington's proclamation that it simply had to be nuclear fusion. The electric solar model is solidly based on plasma laboratory experiments and observed phenomena (such as double layers and plasma modes). It is the accepted fusion model that resorts to postulating the existence of an 'unseen solar dynamo' that lurks below the Sun's surface and conveniently does everything necessary to support their hypothesis. The electric phenomena embodied in the electric Sun model have all been observed and worked with in plasma laboratory experiments for decades.

(3) Thompson states. "In order to reject the fundamental theory of fusion in the stellar interior, it would be necessary, to all at once sweep away literally everything known about hydrodynamics & magnetohydrodynamics, thermodynamics, gravitation, nuclear physics, statistical physics, and electromagnetism." This is a repetition of (2) and is an illogical assertion as well. All of the disciplines listed remain untouched by the Electric Sun model. It is simply that their domain of applicability is restricted. Sustained nuclear fusion using extreme heat and pressure is a

Will-O-the-Wisp (literal meaning - 'fool's fire') that has been desperately sought after for over 50 years. It has never been obtained in any laboratory. Its existence in the Sun's core is nothing more than a ***proclaimed hypothesis***. We cannot see into the Sun. We cannot observe what is occurring below the photosphere. The Electric Sun model does indeed include the probability that empirically confirmed nuclear fusion is occurring near the surface of the Sun.

(4)– (7) These points generally rehash the above. However, in (6) Thompson states, *"…the solar neutrino problem in fact sparked an intense examination of solar models.*" (Not of any ***alternatives to the accepted*** fusion model, however.) And then: *"...the next step is to see if the neutrino models were valid. That was done, and* ***they were found to be invalid***." Yes. Indeed so.

Convection in the Sun

In this section Thompson attacks my use of Juergens' statement: "*Many facile assertions to the contrary, it becomes increasingly obvious that photospheric granulation is explainable in terms of convection only if we disregard what we know about convection. Surely the cellular structure is not to be expected.*" He launches into a detailed description of the Reynolds and Rayleigh numbers. He states: Scott and Juergens "...*made two big mistakes …. First, he thought that convection was controlled by the Reynolds number, which it is not; it is the Rayleigh number that does that*." Here Thompson creates a straw man and then dramatically demolishes it. Of course neither Juergens nor I ever mentioned the Rayleigh number, which is used to distinguish between where heat ***conduction*** occurs and where ***convection*** occurs. Conduction was never even considered to occur – neither by mainstream astronomers nor by us.

In the hypothesized 'convection zone,' the question is not whether convection or conduction occurs. The question is: Since the Reynolds number is so large (remember that how it is numerically evaluated is based on many assumptions about a region we cannot observe), any convection must be turbulent, ***not laminar***, flow. But the photospheric 'tufts' that we do observe are claimed to be the tops of ***laminar columns*** that reach from the Sun's radiative zone all the way up to the photosphere. How these stable columns can exist in the highly turbulent convection zone is what is being questioned. Thompson's injection of the Rayleigh number is simply a red herring. Dr. Eugene N. Parker, perhaps the most eminent solar astronomer, worried in print[4] that, "*the Reynolds number* [in the convection zone] *is on the order of* 10^{12} *and, perhaps worse, the convective zone is vertically stratified."* With Parker on our side, I don't think Juergens or I have to be concerned about Thompson's objection to our using the Reynolds number.

Temperature Minimum below the Corona

Thompson claims I make three separate errors:

(1) He says "*the inverse square law is valid if and only if the radiation propogates* [sic] *through a vacuum; in the case of energy propogating* [sic] *through an atmosphere, it is almost never true*." Really? It seems to work just fine for the wood stove in my living room – and that's definitely in an atmosphere.
(2) "*Scott's argument that the temperature shift at the transition region somehow violates this rule is therefore pointless, since* ***it is expected to violate that rule anyway***." [Emphasis added]. Perhaps Thompson missed the following statement by an astronomer at NRAO: "*One of the great mysteries of the Sun is why it has a solar corona. At the height of the photosphere (the visible surface of the Sun), the temperature is ~5880K. The temperature then decreases with height for several hundred kilometers. But then* ***something amazing occurs****: at greater heights, the temperature increases, gradually at first, and then suddenly to ~3 million degrees.*" [Emphasis added.] Also Dr. Peter T. Gallagher of the Big Bear Solar Observatory said "*Understanding the physics of coronal heating and solar wind acceleration* ***remains one of the unsolved problems of solar physics.***[5]***"*** Thompson should contact them and inform them of their error in suggesting there really is a problem.
(3) Here Thompson states that the Sun is hotter inside than it is on its surface (photosphere), so everything is all right. But the photosphere is not the 'top' of the Sun. This notion ignores the problem of the corona. It is a red herring. It uses 'helioseismology' to prove the Sun is hotter inside. The Sun's lower corona is ***millions*** of degrees hotter than the photosphere. This is not a simple temperature inversion layer caused by rising hot air as observed here on Earth.

A word about helioseismology: This 'science' is an exercise in *a posteriori* 'curve fitting of observed data'. If we see certain oscillations and fluctuations in any set of data we can always 'model' them – fit a mathematical curve to the data by 'least squares fit' or some other criterion. But then to claim that this model 'proves' what is occurring inside the Sun, where no observation has been made (or is possible), is logically unsupportable. Thompson goes on to say, "*The problem faced by solar physicists is not that there is no explanation, but rather that there are too* ***many potential explanations*** *to choose from!*" That constitutes a very poor argument for asserting the unique correctness of the standard solar model. And as we shall see below, disconfirming data is pushed to one side in the hope that someone, someday, will be able to explain it away. Dr. Gallagher and many of his colleagues are not as complacent as Thompson. Astrophysicists are all too prone to hypothesize invisible mechanisms (they often call them 'dynamos') and unobservable forces (dark energy comes to mind) whenever their gravity-only fusion model needs propping up. Thompson's "many potential explanations" are unlimited in number only because of the keenness of astrophysicists for inventing yet more arcane, fictional, invisible entities and forces – while steadfastly ignoring electrical explanations.

Acceleration of the Solar Wind Ions

Wal Thornhill has already referred Thompson to low-pressure gas discharge physics as being the appropriate model to use, not simple electrostatics. As a pseudoskeptic, Thompson refuses to address his remarks to this model because it refutes his beliefs and he can't find any authority to quote that has ever considered the possibility. In the gas discharge model, interplanetary space is an extensive plasma region termed the 'positive column,' which is characterized by almost equal numbers of positive charges (ions) and electrons. The plasma is electrically 'quasi-neutral,' like a current-carrying copper wire. And like a copper wire, it is a region with a weak electric field that causes a steady *drift* of electrons toward the more positive 'sink.' (The drift speed of electrons in a current-carrying copper wire is typically measured in cm/hr!) The drift current focused down from the vastness of space powers the Sun. The drift field is also responsible for the weak acceleration of positive ions away from the Sun. The result is the quasi-neutral solar 'wind.' The electric Sun model is the only one that has a consistent satisfactory explanation for the solar wind.

The phenomenon known as the 'plasma frequency' is caused by the ionized (free) electrons' tendency to lurk and oscillate around the neighborhood of positive ions. The fact that many electrons hover around the vicinity of these accelerating ions is not a contradiction of the ES hypothesis. Only a meager fraction of these electrons are needed to power (to drift toward) the Sun. The accelerating ions are (one of many) currents that are part of a circuit. The electrons are also part of that circuit (driven by circuit potentials, not a 'central pith ball' electrostatic potential). These currents will be 'pinched' into filaments, sheets and heterogeneous paths. Thompson invokes Maxwell by saying, *"...according to Maxwell's equations, a time variable magnetic field will generate an electric field, which will accelerate a charged particle*." True. A time-varying magnetic flux will generate an electric field around a closed path that encircles the flux. But ***what causes that time variation in the magnetic field?*** The standard non-electrical response (as I understand it) would be that the magnetic field is frozen into the plasma, and gravity, convection, or some other mechanical force moves the plasma, thereby 'powering' the variation in the magnetic field. But, as decades of laboratory and space research have shown, magnetic fields are ***not*** frozen into plasmas. Changing electrical currents change magnetic fields. The pseudoskeptics never mention these required – and measured – electrical currents.

Periodic Fluctuations in the Sun's Output and Size

TT writes, "*There are two kinds of 'periodic fluctuations'. One kind has been known about for centuries, and refers to the various classes of variable stars… The other kind is of recent discovery, and now goes by the monicker of 'helioseismology', when applied to the Sun, or 'astroseismology' when applied to other stars*."

The issue of helioseismology is actually a diversion. The electrical model of stars is not concerned with what lies beneath the glowing photosphere because the energy deposited in the photosphere does not come from within. The photosphere does not constitute a 'surface' but is a plasma discharge phenomenon. However, helioseismology may provide evidence that the thermonuclear model is incorrect. That is the basis for highlighting evidence that suggests the Sun is practically isodense throughout.

The cause of solar fluctuations is not understood, but that has not stopped theorists from applying helioseismology to the standard solar model in the belief that it will help to validate that model. The standard solar model qualifies under Langmuir's definition of pathological science because it is '*a fantastic theory contrary to experience*.' All physical bodies transfer internal heat by conduction and convection—except the Sun and other bright stars, which throughout most of their volume, we are told, transfer heat by internal radiation.

The standard solar model qualifies twice because discordant findings, like those of the dominant radial oscillation mode, are met by minimizing their importance, adjusting the model *ad hoc*, or outright denying that the data means what it implies. We are witnessing dogmatic, rather than scientific, skepticism in relation to the 160-minute solar oscillation.

As a pseudoskeptic, TT chooses first to minimize the importance of the data by implying that the early papers concerned were thrown into doubt by later research. He mischievously introduces confusion about what was being observed. There was indeed confusion about the implications because they are potentially devastating to the standard solar model. However, in 1991, in a chapter in *Solar Interior and Atmosphere* by Hill, Fröhlich, Gabriel and Kotov, titled "Solar Gravity Modes," there is no such doubt. It points out that the 160-minute oscillation was considered very skeptically because it implied "*radial pulsations of a star being homogeneous in density.*" It is such a direct challenge to the validity of the thermonuclear model that more than a decade of research was dedicated to the issue. That research effort concluded that the total set of the Crimean 1974-1987 observations confirmed the existence of the solar pulsation with a period of 160.01 min, which appeared to keep constant (in average) initial phase.

In a 1985 paper, Kotov summarizes the enigma of the 160-minute periodicity: "*it is beyond doubt, on the basis of the solar observations and the facts discussed here, that the nature of the 160-min oscillation, firstly found in the Sun* ***and then in the solar system as a whole*** and then ***amongst the stars****, does present a new challenging problem for astrophysics.*" [Emphasis added.] Only the externally powered electrical model of stars provides any possibility of a connection between such widely separated bodies.

TT is very selective in his presentation of evidence from the referenced papers, and he provides no quotations from his list of 'Sources' to address the issue. Those sources are therefore irrelevant and merely serve as an appeal to authority. They are idle 'window dressing.'

The Electric Sun Hypothesis

Thompson states, "*The best way to make sense of any new idea, is to start off with what you **know**, and see if that knowledge, and the new idea, are compatible*." This implies that he already ***knows*** what powers the Sun – so anything that challenges that presumption is wrong by definition. There are many misstatements of what the major characteristics of the electric Sun model are – so many in fact that I would essentially have to copy here an entire two-chapter segment of my book. The major omission from Thompson's discussion is any mention of the plasma characteristics of a spherically shaped active plasma. And he states as fact things we do ***not*** know. For example: "*Juergen's* [sic] *assumed an extremely unrealistic velocity of about 105 meters per second (about 0.1 km/sec), when the real velocity is more like 20 km/sec*" [for electrons approaching the Sun's heliopause from interstellar space]. First of all, we have not made any measurements beyond the heliopause, so one man's estimate of this velocity is as valid as another's at this time. In fact, data from the Voyager spacecraft are not meeting conventional expectations in that region. But most important is the fact that Juergens assumed a velocity of 10^5 not 105. Thompson misread Juergens' paper.

His discussion of the Lorentz force, $\mathbf{F} = q\mathbf{E} + \mathbf{V} \times \mathbf{B}$, omits the singularly important point that it is exactly this force that reduces the mobility of transversely directed charges in a magnetic field and results in (magnetic) field-aligned currents – often called Birkeland currents. Thus, these incoming electrons will spiral inward in roughly the same direction as the solar magnetic field.

Thompson follows this by admitting, "... *even if the total number of electrons seems like enough for an electric sun, getting them to the sun is quite a chore, since they move in excess of escape velocity, and are pushed off by the magnetic field*."

Discussions of 'escape velocities' ought to embarrass him. First of all, electrical forces experienced by electrons are at least 10^{36} times as strong as the gravitational force. Electric charges in an electric field do not pay the slightest attention to gravity – the concept of 'escape velocity' does not apply to charges in an electric field. The charges moving in the wire going to your coffee maker do not respond to gravity; you do not have to place the coffeemaker lower than the wall outlet into which it is connected in order for the charges to flow down into it. These gravitational arguments are almost identical to those raised against Birkeland when he said electric charges ('corpuscles') come all the way from the Sun to Earth, enter the earth's vicinity via the cusps in its magnetic field, and power the auroras. It was claimed then too that charges would never be able to

do that – they would be somehow diverted. Of course, we now know they do exactly that.

Prominences, Flares and CMEs

In this section, Thompson's first sentence demonstrates his ignorance of the processes that are involved: "*Scott shows **an image** from the Transition Region And Coronal Explorer (TRACE) spacecraft, **of a typical magnetic loop** over the photosphere*." [Emphasis added.] No image of a magnetic field has ***ever*** been taken. Magnetic fields are invisible. What we can (and do) see is plasma in the glow or arc mode. The plasma in the TRACE image is emitting light because it is carrying electric current. So it would be more accurate to say these are ***electric current loops*** and these looping field-aligned currents are following magnetic paths.

These loop currents ***must*** generate magnetic fields of their own that link them. They may also contain a potentially explosive double layer (DL). Either of these mechanisms (the surrounding flux or the DL) is capable of interrupting the loop current, which will immediately release energy stored in the local magnetic field. This release gives rise to the ejection of matter, which is carried along – the CME. This explanation was offered by Hannes Alfvén in *Cosmic Plasma* in 1981. Thompson has the pseudoskeptics' predilection of ignoring things he doesn't want to admit exist. Gravity-only astrophysicists are trained to think of magnetic fields as prime movers that for some unknown reason initiate movement and act independently, causing whatever is observed. Alfvén was adamant that such an approach could lead only to misunderstanding of the actual physical process that ***must involve consideration of the causal electric currents.***

Magnetic Reconnection

Thompson states that, "*The 'reconnection' of magnetic field lines is a very standard topic in plasma physics*…" Actually it is not. It is becoming a popular topic only among those physicists who have never had an engineering course in electricity and magnetism and take delight in inventing 'new science' in order to explain how energy is released from a magnetic field without admitting electric currents are involved.

"*Magnetic reconnection is very much a standard (observed) mechanism for transferring energy within a variable magnetic field, or transmitting energy between magnetic fields*." Says Thompson. Actually 'magnetic reconnection' has ***never*** been ***observed***. What has been observed is the release of large amounts of energy from magnetic fields in which it was previously stored.

Sources: Thompson lists several papers written by people such as those I describe in the first paragraph in this section. The number of papers cited do not indicate correct knowledge – they indicate the degree to which an insular group of astrophysicists have run off down the wrong road after having refused, as

undergraduates and graduate students, to take courses that fully explain and apply Maxwell's equations (such as the ones I taught for thirty-nine years at a major university).

Any electrical engineer (or physics student who has studied EM field theory) will easily show Thompson (and his colleagues) the error of their ways. All it takes to understand this argument is to recognize the clear difference between 1) conceptual constructs that are convenient tools for thinking about and visualizing a process, and 2) the physical process itself. The former (the concept) exists only in one's mind (or as a draftsman's artifice). It does not ***exist*** in three-dimensional space. The latter (the process) concerns the movement or interaction of things that really ***do*** exist in our world. Once this difference is fully grasped, it is easy to see that magnetic field lines do not (cannot) ***do*** anything in the real world – because they do not exist in the real world. I remember well the undergrad who once asked me if electric fields were really red (because I always used red colored chalk when I sketched them on the blackboard). I hope I convinced him that E-fields didn't have any given color. Similarly I wish I could convince Thompson that magnetic field lines ***do not have any substance***. And they ***do not move.*** They are instantaneous descriptors of (the magnitude and direction of) a vector field – and nothing more.

I have little hope of persuading Thompson of his error, so the following example is not intended for him. It is for the benefit of anyone who wishes to learn about the proper use of magnetic field lines.

Example:

First, consider the magnetic field produced across an air gap in, say, a DC electric motor. An idealized sketch is shown below in figure 1(a). Lines are drawn flowing downward, out of the N pole of the magnet at the top, to illustrate the direction and strength of the continuous magnetic field. They flow downward and enter the S pole of the magnet at the bottom. Because the field lines are shown as parallel lines, this implies the magnetic flux density (strength) is the same at any cross-section in the gap. This will not be the case in practice. Actually the field will bulge out a bit to the right and left (and front and back), exhibiting a lower magnetic flux density near the center of (halfway across) the gap. The field lines should be drawn more widely spaced there than near either of the poles. But this is an idealized case designed to demonstrate the utility of magnetic field lines.

Now consider the field that would be produced by a straight conductor positioned halfway between the N and S poles that carries a time-invariant current ***into*** the page. The field caused by this current is cylindrical in shape, and its strength decreases as the first power of the distance from the conductor. Thus the farther we get (radially) away from the center of the wire, the more widely spaced the circular lines are drawn (the weaker the field is). The field's direction is given by the right hand rule and is as shown in the diagram. These two fields are the

components whose vector sum (at every point in the plane shown) is the total resulting field.

I have made a rough sketch of what this result would look like in (b). The dotted circle in (b) is a *separatrix* that defines a surface, within which magnetic flux links only the wire and does not reach to the bar magnet poles. The small black dot (at the nine o'clock position on the separatrix) is a ***null point***. At such points the strength of the overall magnetic field is zero valued. This is the point where uninformed 'scientists' claim 'magnetic reconnection' occurs. (The situation shown in this diagram is the basis of 'motor action'. Since this configuration exists in just about every operating AC and DC motor in the world, one wonders why CME-like flashes don't erupt more often in factories that use such motors.)

Let us suppose the conductor is free to move (slide in the horizontal plane) either to the right or to the left. Will it tend to move? If so, which way will it go? The correct answer is given by the Lorentz equation, **F** = q**E** + **V** x **B.** Because there is no important electric field in our example, the first term on the right is zero. The velocity vector **V** is the velocity of any positive charge flowing in the conductor and is directed into the page (away from the reader). The magnetic field **B** due to the bar magnets is pointing downward. So 'crossing **V** into **B**' produces a force vector **F** that is directed toward the left. The conductor will

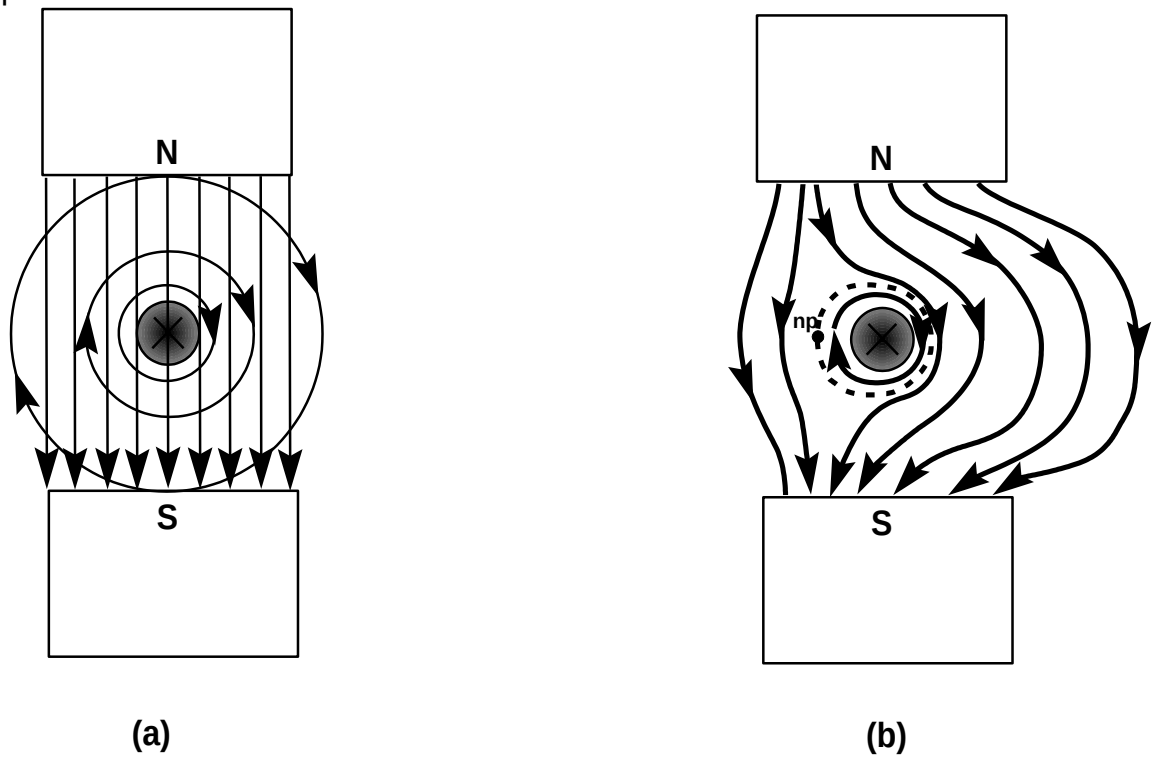

Figure 1. Idealized sketch of the magnetic fields due to an air gap and a current carrying conductor. (a) The individual component fields. (b) Sketch of the resulting total field.

experience a force pushing it toward the left. That's what happens. Please note carefully that magnetic field lines have not (and do not) enter into the mechanism or its description in any way.

But sometimes in the classroom we use the 'rubber-band' analogy: look at figure 1(b) and think of the 'magnetic lines' you see drawn there as if they were rubber bands. The ones to the right of the conductor seem 'stretched' more than the lines to the left. The stretched lines (rubber bands) seem to 'push' the conductor to the left.

Thompson would say, "See, this shows that magnetic field lines ***do push on things and move things around!"*** **–** ***THEY DO NOT!*** As with contour lines on a topographical map, the lines may 'stretch' farther around one side of a mountain (because there's a meadow on that side) than on the other, but that doesn't mean the 'stretched' lines "push" on the meadow.

What we ought to conclude from this example are the following points:

- Magnetic field lines are ***only*** convenient concepts – nothing more. They are ***not*** loci or contours of constant magnetic flux density (field strength). They just indicate the field's direction. In regions where they are close together the field is stronger than where they are widely separated.
- Therefore, sketching magnetic field lines can help us visualize the shape and strength of magnetic fields.
- They can help us to sketch the net result (vector sum) if and when two or more fields interact (are superimposed on each other).
- We can only draw magnetic field lines (in cases not involving permanent ferromagnetic magnets) by considering the electric currents that create those fields.
- Magnetic lines of force do not actually exist in three-dimensional space anymore than lines of latitude or longitude do.
- If a field moves from one instant to another, we cannot use 'streaming video' to watch a given line move and change shape. This is because we must re-draw a complete set of lines at each instant. It isn't the same line that has moved, it is the field that has changed. The two sets of lines describe the field at those two different times.
- Magnetic lines of force do not move anymore than lines of longitude do. A determined unwillingness to recognize this fact has led to the idea that lines move toward each other, touch, merge, and then release energy. I have said many times that this last notion, if applied to circles of longitude that come together and 'merge' at Earth's poles, could be proposed as causing gravitational energy releases at those locations.
- There is no such process as 'magnetic merging' or 'reconnection' of magnetic field lines in the real world any more than the 'rubber-band' analogy is a real process.

Where do we stand?

We stand at a time in scientific history that will be embarrassing to look back on from the vantage point of the next century. An entire subgroup of science consisting of a majority of astrophysicists and cosmologists is now – and has been – smugly ignoring the fruits of 150 or so years of electrical science. This sub-group feels perfectly confident in postulating the existence of processes and entities that cannot be verified experimentally in earthbound labs. When there are perfectly valid electrical explanations for certain phenomena, it is irresponsible to ignore those explanations and invent 'new science' to avoid using them. People will ask, years from now, "How could they have ignored electricity in space when it was staring them in the face?"

Classic astronomy (and its offshoots: helioseismology, astrophysics, cosmology, etc.) have never made any real predictions that turned out to be true – although they are past-masters at inventing 'dynamos' and invisible entities to explain things ***retroactively***. After-the-fact explanations are easy, especially if you can get away with saying "The hidden 'dynamo' did it." Before they were forced into it, classical astronomers were wrong about how the auroras are powered, about the temperature of Venus, about the rocky nature of comets, about x-rays coming from comets and other objects, about the existence of natural radio emissions from the planets. And I claim they are wrong about many things they are now saying about the Sun.

Of course the Electric Sun model is speculative. But these speculations are reasonable extrapolations of the solid, experimentally verified properties of plasma. We are not positive that everything included in the ES hypothesis is 100% correct. We do not claim omnipotence or perfection for our early models. But, the 'standard' astrophysical models are far ***more*** speculative. They are built up of speculation cantilevered onto speculation that is ever farther removed from any empirical basis. And a tremendous amount of doubt is piling up about them. They do not explain (without *ad hoc* and *a posteriori* adjustments) many of the observations that are being made – as the Electric Sun model does. (The fusion model doesn't even explain why the solar corona ***exists*** in the first place, let alone its three million Kelvin temperature inversion.) Each time new data comes in from space probes, astronomers typically announce their ***surprise*** and rush 'back to the drawing board'. They then busy themselves modifying (adding complexity to) their models – reminiscent of Ptolemaic epicycles – and emerge confidently claiming they knew this all along. In the one case where they deigned to make reference to anything electrical (the release of magnetic energy) they got it wrong and had to 'discover' new properties of magnetic fields that do not exist.

Call it what you will – Plasma Cosmology, the Electric Universe or the Electric Sky – the thrust of what was started by Kristian Birkeland (when he discovered the true electrical nature of the auroras), Hannes Alfvén, and Irving Langmuir (each of whom were awarded Nobel Prizes for their work) continues. And it will

take more than the confrontational, parochial, pompous smoke screens of pseudoskeptics such as Tim Thompson to stop it.

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[1] 'Many of our beliefs are not based on evidence that we have examined' and 'we are quite casual about evaluating evidence that goes against beliefs we hold strongly.' Prof. Lewis Wolpert, *Six Impossible Things Before Breakfast* (Faber & Faber 2006).

[2] Brian Josephson, Nobel Laureate and professor of experimental physics at the Cavendish Laboratory at Cambridge, http://www.skepticalinvestigations.org/exam/Josephson_disbelief.pdf. Also http://www.plasma-universe.com/index.php/Pseudoskepticism

[3] http://www.physorg.com/news95517501.html

[4] "The Physics of the Sun and the Gateway to the Stars," Eugene N. Parker, *Physics Today,* June 2000, p. 26-31.

[5] Seminar on Observations and Modeling of the Corona and Solar Wind – Big Bear Solar Observatory