

## THE CURRENT STANDARD SOLAR MODEL IS THE BIGGEST HURDLE TO SCIENTIFIC PROGRESS

### ABSTRACT

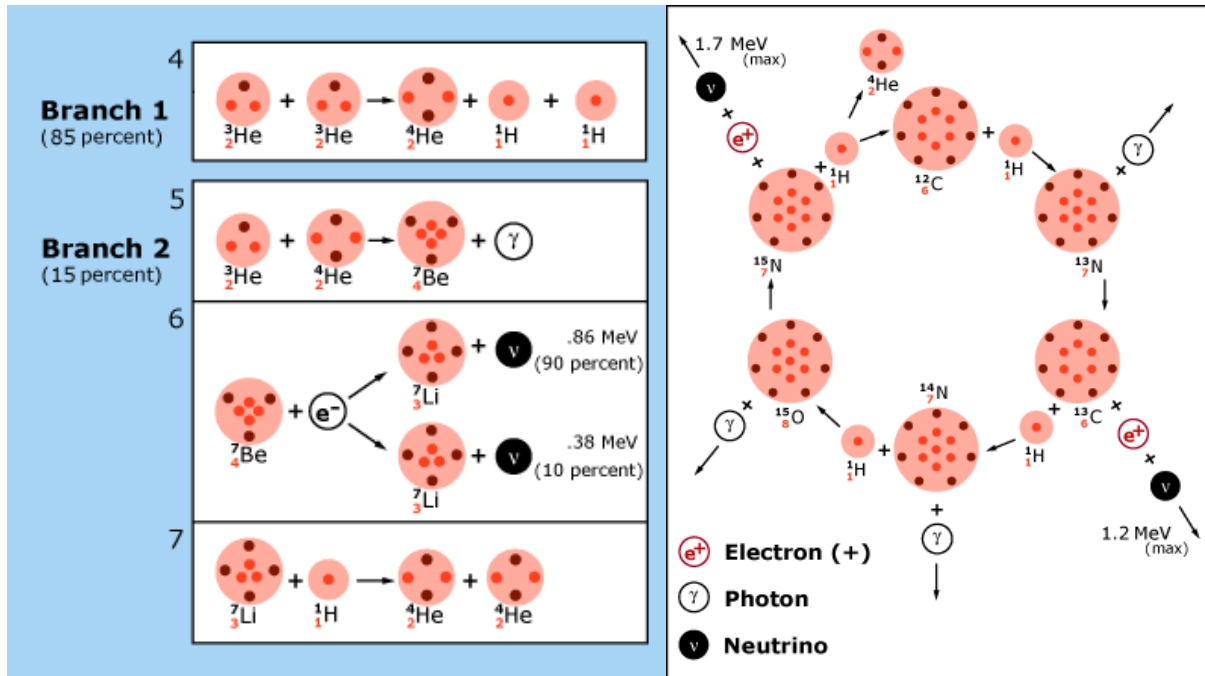
*Thermonuclear research was initiated by theoretical physicists in the early 1920s based on pure speculation. Georgii Gamow, Robert Atkinson, and Fritz Houtermans proposed that the energy production in stars was derived from the collision of atomic nuclei. Gamow was the first to suggest that in the interior of stars, atomic nuclei can occasionally collide and fuse, as a result huge amount of energy is released. This energy is what powers the stars. In 1929 Houtermans and Atkinson published a paper, in line with the concept of Gamow.*

*Keywords: standard solar model, thermonuclear fusion, solar physics, theoretical physics, controlled thermonuclear reactions*

### DISCUSSION

Gamow started his research on thermonuclear fusion in George Washington University and was joined by Edward Teller. They were soon joined by another mathematical physicist Hans Bethe. They proposed two types of thermonuclear reactions to the questions of stellar evolution, (H-H) and (D-D). Rutherford, in 1937 proposed another reaction, namely, (D-T) between deuterium and the tritium produced in the D-D reaction. Two years later Hans Bethe who was professor at Cornell University, published his famous paper, *Energy Production in Stars, H. A. Bethe. Phys. Rev. 55, 434 – Published 1 March 1939.*

<https://journals.aps.org/pr/abstract/10.1103/PhysRev.55.434> where he thought to identify the most likely thermonuclear reactions which generate energy in the sun and other stars. Bethe assumed based on his theoretical model that process called proton-proton fusion is taking place within the cores of the stars with two possible cycles. P-P and the CNO cycles. According to Bethe stars heavier than the sun, CNO (Carbon-Nitrogen-Oxygen) cycle of nuclear fusion is the dominant source of energy generation. See the figures below.



The two figures (P-P Cycle on the left and CNO Cycle on the right) are adapted from J. N. Bahcall, *Neutrinos from the Sun*, Scientific American, Volume 221, Number 1, July 1969, pp. 28-37.

It is important to note that Eddington and the rest of theoretical physicists thought that the pressure and temperature at the sun's core can be determined by its mass, coupled with the standard gas laws. And, they assumed that the mass of the sun could be calculated from the orbital motions of the planets. The following are quotations from Eddington's paper *The Internal constitution of the Stars*. "It is not enough to provide for the external radiation of the star, we must provide for the maintenance of the high internal temperature, without which the star would collapse"

"The problem of the source of a star's energy will be considered, by a process of exhaustion we are driven to conclude that the only possible source of a star's energy is subatomic yet it must be confessed that the only hypothesis shows little disposition to accommodate itself to the detailed requirements of observation, and a critic might count up a large number of fatal objections" "In seeking a source of energy other than contraction the first question is whether the energy to be radiated in future is now hidden in the star or whether it is being picked up continuously from outside. Suggestions have been made that the impact of meteoric matter provides the heat, or that there is some subtle radiation traversing space which the star picks up. Strong objection may be urged against these hypotheses

individually, but it is unnecessary to consider them in detail because they arise through a misunderstanding of the nature of the problem. No source of energy is of any avail unless it liberates energy in the deep interior of the star."

"In 1920 at the meeting of the British Association for the Advancement of Science, Eddington, said "A star is drawing on some vast reservoir of energy by means unknown to us. This reservoir can hardly be other than the subatomic energy which, it is known, exists independently in all matter. ... The store is well nigh inexhaustible, if only it could be tapped ... F. W. Aston's experiments seem to leave no doubt that all the elements are constituted out of hydrogen atoms (protons) bound together with negative electrons. But, the mass of the helium atom is less than the sum of the masses of the four hydrogen atoms which enter into it. There is a loss of mass in the synthesis amounting to about one part in 120. ... Now mass cannot be annihilated, and the deficit can only represent the electrical energy set free in the transmutation. We can therefore at once calculate the quantity of energy liberated when helium is made out of hydrogen. If five per cent of a star's mass consists initially of hydrogen atoms, which are gradually being combined to form more complex elements. We need look no further for the source of a star's energy. ... If indeed the subatomic energy in the stars is being freely used to maintain their great furnaces, it seems to bring a little nearer to the fulfilment of our dream of controlling this latent power for the well-being of the human race or for its suicide."

Those theoretical physicists came to the conclusion that hydrogen is the right element for thermonuclear fusion. They could not realize that hydrogen has the highest potential energy ( $M/A$ ) and the highest charge density ( $Z/A$ ). Nevertheless, hydrogen, which is supposed to make 74 percent of the sun is completely ionized, and that means the electrons and protons are free to collide. Bethe and Eddington proposed that such collisions induce a chain of nuclear reactions. In the first stage, two protons are fused together forming a deuteron, a positron and a neutrino. But, in order for this reaction to take place, the protons must be too close to each other, approximately 0.1 trillionth of a centimetre and at the same time one of them has to decay to a neutron and positron. The second stage of (p-p) chain would involve the formation of a nucleus of an isotope of helium,  ${}^3\text{He}$ , which consists of two protons, one neutron, and a gamma ray photon. The second stage is supposed to be the result of the fusion of Deuteron with another proton. In the last stage, the  ${}^3\text{He}$  isotope has to fuse with Deuteron to form a helium nucleus,  ${}^4\text{He}$ , and two protons. One must keep in mind that before the last stage can take place, the first and the second ones must occur twice. Although, in the early years (the first half of the 20th century), theoretical physicists were arguing that p-p chain reaction can occur

since there is a vast supply of protons available, but later on calculations based on the theoretical model showed that the reaction cannot possibly take place within the core of the sun. It is extremely improbable. The probability is one reaction per particle in 14000,000,000 years. In other words, this reaction cannot happen even with the hypothetical extreme conditions that supposed to exist at the center of the sun.

Theoretical physicists combined two hypotheses that they do not exist in physical reality. In spite of that, this pseudo astrophysics theory was enhanced further by the mathematical model of Hans Bethe and theoretical physicist Subrahmanyan Chandrasekhar. The most basic problem that faced the advocates of thermonuclear fusion, was the Coulomb barrier. According to the standard gas laws, the temperature and pressure assumed at the core of the sun are not sufficient for thermonuclear reaction to take place. But, theoreticians came to the rescue. They proposed the so-called Quantum Tunneling (QT). (QT) is a real subatomic physics phenomenon but it has nothing to do with quantum theory. The basic question that one should ask, is the reason for the tunneling effect. Why does it take place even if the potential is higher than the kinetic energy? QT is a magic notion and it is not the only one. Quantum mystics came up with plenty of them, like virtual particles, entanglement, re-normalization, borrowing energy from the vacuum and so many others. These mystic notions are attempts to explain - and only superficially- observations on subatomic and cosmological scales that Newtonian physics can't explain them.

Nevertheless, the so-called QT is a subatomic magnetic phenomenon similar in some ways to superconductivity. Superconductivity is characterized by the Meissner effect, the complete ejection of magnetic flux fields from the interior of the superconductor as it transitions into the superconducting state. QT is also an expulsion of magnetic flux fields from conducting materials. When two conducting materials are very close and separated by a small insulating barrier, just a few nano-meters at very low temperatures or a very high temperature. In these situations the conducting materials on either side of the barrier would form a layer - due to the expulsion of magnetic flux fields - on their surface and overcome the barrier width, rather than penetrating through it as currently believed. **Nature does not perform magic**

However, it is extremely important to keep in mind, if QT is taking place within the core of the sun then neutrino production would depend sensitively on the central temperature of the sun. Since, the number of charged particles (P-P) that must collide to generate thermonuclear fusion is small, compared with the energy

of the potential barrier. Only a tiny fraction of the nuclear collisions in the sun can overcome the potential barrier and cause the fusion. This fraction is so sensitive to the temperature. Just 1% error in the temperature corresponds to about 30% error in the predicted number of neutrinos, and 3% error in the temperature results in an error of factor of two in the predicted number of neutrinos. Recent observations with sensitive imaging devices on board advanced space telescope, the (SDO) have shown that the motions of the plasma within the core of the Sun to be two orders of magnitude slower than what theoretical models predict. This is clear verdict about the real temperature range within the core of the sun and that means this subatomic magnetic phenomenon (QT) cannot possibly take place within the core of the Sun. The temperature and pressure within the interior is totally different than what theoreticians believe. So, in spite of this observed fact, physicists still do not question the validity of thermonuclear reaction. Because, this hypothetical reaction is considered by mainstream physicists as one of the two most fundamental physics facts that dominate astrophysics and astronomy. The other one is the so-called gravitational collapse. In fact, the hypothetical thermonuclear fusion is supposed to be a consequence of the gravitational collapse. The fusion is occurring in response to gravity's attempts to compress the mass of the sun, countermeasure to the compression attempts by gravity. Gravitational compression or gravitational collapse cannot possibly take place in the interior of the stars. This notion is a consequence of the misunderstanding of gravity.

## **CONCLUDING REMARKS**

All types of thermonuclear reactions are quasi-nuclear fusion reactions. These reactions can never be sustained for sufficient time which would allow the fusion process to be completed. Without sustainability the final phase of the fusion reaction cannot be reached and consequently the output energy or rather the energy gain cannot be obtained. In other words, thermonuclear reactions are laboratory induced quasi-nuclear reactions that should not be characterized as natural nuclear fusion reactions that take place in stars or anywhere else in the Universe. Decades of experimental research using state of the art fusion devices have shown the quasi nature of thermonuclear reactions. *Generated Plasma from Thermonuclear Reactions would stay forever Unsustainable and Inefficient.*

<https://www.linkedin.com/pulse/generated-plasma-from-thermonuclear-reactions-remain-ever-shrair>

But, the failure of controlled thermonuclear reactions is not the only evidence for their quasi-nuclear fusion nature. The so-called H-bomb is another empirical

evidence that reveals the unsustainable of these kinds of reactions. Contrary to what is currently believed, the H-bomb is not a demonstration of thermonuclear fusion. ***The weapon device is based mostly, if not entirely on the process of fission reactions.*** <https://www.linkedin.com/pulse/super-lie-jamal-shrair>

On the other hand, decades of observations from space using the latest advanced telescopes and other instruments have shown the notion of thermonuclear powered stars to be worse than the worst science theory of the middle ages. And if we restrict the discussion to the Standard Solar Model (SSM), we find that from the last four decades of the 20th century the model needed continuous mathematical interventions to save it. And in the last one and a half decade, however, the mathematical interventions became increasingly difficult to be implemented. This is due to the new generations of space telescopes and other space instruments that have more sensitive devices on board for imaging and detection purposes. The data collected from these advanced space instruments have exposed the endless mathematical fantasies that have no relations with the physical reality of our star. In fact, all solar observations since 1960s using space based devices have shown the SSM to be an obsolete mathematical model. The claim that the model explains the basic features of the Sun is not even wrong. None of the basic features of the Sun- without exception- can be explained by the SSM. The so-called solar neutrino problem-which is in fact, not a problem or a puzzle to start with-that supposed to be solved in the beginning of the last decade, by the invented quantum mechanical concept of neutrino oscillations, is just one of them. Moreover, Kirchhoff's law of blackbody radiation has provided another indirect superficial evidence to the current solar model and stellar evolution model in general. Kirchhoff's law of blackbody radiation is definitely wrong as it has been pointed out by Dr. Pierre-Marie Robitaille.

***Nothing could be further from the truth, the current mainstream model which treats the Sun as a ball of neutral gas is totally wrong. The crisis of solar pulsations and the recent crisis of solar abundance have exposed the fundamental flawed within the SSM beyond any shadow of a doubt. They are very serious crises and should be considered as the last nails in the coffin of the current solar dogma.***

However, the misunderstanding of gravity and its real role in the distribution of matter in the Universe is the most fundamental reason which prevents true understanding of our star, the planets of the solar system and the cosmos at large. The misunderstanding of gravity is also the fundamental reason that led to the invention of Quantum Mechanics (QM) and Relativity Theories (RT). QM and RT

contaminated astrophysics and subatomic physics with very complicated pseudo-physics notions. Theoretical physics has been gradually transformed to a new field which is now a billion times closer to mysticism and metaphysics than to the field that deals with the principle of cause and effect (Causality).

The force that rules, powers and absolutely unifies the Universe cannot be realized without comprehending the real building blocks of matter. This task is the most fundamental requirement in physics. Without it, gravity cannot be understood or revised and physical facts about our solar system cannot be revealed, not to mention about the Universe. On the other hand, if the real building blocks of matter and the force which is permanently present in them can be comprehended, then all physical phenomena observed on any scale can be explained logically and without the need to invent new pseudo physics theories for superficial explanation. The trend of inventing arbitrary notions, like imaginary particles, unobserved substance or energy, in order to enforce any observations into the myth of the big bang and gravity-dominated Universe are the basic features of theoretical and astrophysics. One wonders why should we build space telescopes and other astronomy tools, if the data obtained by them have to be enforced into an outdated theories that are mostly based on speculations and mathematical fallacies.

**1-The external energy supply to the sun is overwhelmingly obvious and has recently been detected by space probes <http://www.journalcra.com/article/external-energy-supply-sun-overwhelmingly-obvious-and-has-recently-been-detected-space-probe>**

*Youtube* ( [https://www.youtube.com/watch?v=EPhX2gu\\_8pg](https://www.youtube.com/watch?v=EPhX2gu_8pg) )

**2-The Solar Neutrino Problem Has Not Been Solved**  
<https://cirworld.com/index.php/jap/article/view/5950/6027>

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