A NEW MODEL OF SUPERNOVA TYPE I

By virtue of the title, the reader may be asking, why should we consider a possible alternative model to supernova type I? There are at least three reasons for seeking a new model. Any *one* of these reasons, *unto themselves*, should cause questions to be raised about the validity of the current model. All three of them combined would, for all intensive purposes, virtually *demand* the development of a new model. As with previous astronomy papers at this web site, the contemporary model behind supernova type I will be briefly reviewed should the physicist be unfamiliar and/or forgotten the nature of the current model. (Astronomers can skip straight to the paragraph that begins with the number 1.)

Contemporary theory dictates that a supernova type I results from a binary star system. Initially, one of the stars in this system possesses greater mass than the other. Consequently, it evolves to the red giant stage more rapidly than the other. Since the red giant is significantly larger than its companion, material will be drawn from the giant and attracted to the companion. In accordance with fundamental theory of stellar evolution, the giant will eventually become a white dwarf. Eventually, the situation will be reversed. The companion to the white dwarf will become larger and material from it will flow to the white dwarf. In order to conserve angular momentum, the material will establish itself in the form of an accretion disk around the white dwarf. Once this accretion disk reaches the Chandrasekhar limit, the pressure of the accretion disk will cause the internal dynamics of the white dwarf to be compressed in such a manner as to cause the white dwarf to explode. The energy released is phenomenal. It is even more energetic than the energy released in a supernova type II. As previously stated, there are at least three cogent reasons for opposing this model.

1. The model behind nova and supernova type I are very similar. Specifically, the idea of a binary system and the subsequent development of an accretion disk on the white dwarf. Despite fairly similar models, there is an enormous disparity in the frequency of the phenomena. On average there are two supernovas (both type I and type II) per galaxy, per century. This means there is an average of one supernova type I per galaxy, per century. However, there are an average of ten novas per galaxy *per year*. That, of course, entails 1000 novas per galaxy, per century. The reader can clearly see that we are dealing with a disparity of 1000 to 1. When theory dictates that the underlying model behind these respective phenomena are essentially similar, why is there such an enormous disparity in the frequency of their occurrence?
2. For a supernova type I to explode, the accretion disk must be equivalent to the Chandrasekhar limit. However, if we accept the current model behind novas, how could the accretion disk ever reach the Chandrasekhar limit? To illustrate this, let me repeat a joke. On a cold winter day, a boy arrives late at school. The teacher asks why he is late. The boy says there was nothing but ice outside and it was very slippery. For every two steps he took forward, he slid three steps back. The teacher says she knows he's lying. If what he said is true, how did he arrive at school at all? The boy says that he turned around and started walking home. Well before the Chandrasekhar limit was reached, the accretion disk would be blown off and be viewed as a nova. Consequently the Chandrasekhar limit would never be reached and a supernova type I would never develop.
3. The accretion disk is predominately comprised of hydrogen. However, when the spectrum of a supernova type I explosion is examined, the spectral lines of hydrogen do not appear. This would be yet another serious anomaly in the current model of supernova type I.

As has already been stated, any one of these anomalies should raise questions about the validity of the current model. However, given all three of them combined, it would seem that the development a new model of supernova type I is rendered imperative. Fortunately, with the development of the new scientific theory presented in The Primary Source of Stellar Energy, a new model readily presents itself.

Since empirical data dictates that a supernova type I is a very rare phenomenon (one per galaxy, per century), the underlying "mechanism" behind this explosion must be reflective of something that would only transpire on an exceptionally rare basis. In the paper, The Primary Source of Stellar Energy, it was pointed out that to achieve the effect (stated in that paper), there must be an inordinate number of high frequency photons. The rationale being that a precise sequence of events must transpire for a photon to "explode" and release its energy. Even in an environment "rich" in high frequency photons the number of photons which would meet the "requirements" to induce such a reaction would be inordinately small. Of all the photons present in the core of a star, only the tiniest fraction would release their energy in the manner described in the paper previously referred to. However, what if an exceptionally rare event transpired? What if an inordinate number of photons were emitted in the manner described in that paper? That would entail an inordinate number of photons *simultaneously* releasing their energy. If the number of photons accomplishing this were sufficient in magnitude, this would be the equivalent of an explosion. If the explosion possessed sufficient energy, the entire star would be blown away and destroyed. This is what we currently observe when a supernova type I explodes.

It may be possible to develop this model in (somewhat) greater detail in order to further expound upon why the event is so rare and why the spectrum of supernova type I is devoid of hydrogen. The explosion may transpire (on a phenomenally rare basis) when the transition is being made from the main sequence to the red giant stage. When a main sequence star has “used up” the energy within its core (this would entail hydrogen being depleted *and* electrons losing their internal energy to prevent the further production of photons) the star will contract due to a centripetal force from its rotation and the lack of energy within the core to halt its contraction (if the reader is wondering why contraction via a centripetal force is being advocated as opposed to a gravitational collapse, this has been explained in the theory of quantum gravity). At that stage, whatever “residual” heat was remaining within the star would be transferred to the very small central core. Furthermore, a certain portion of the atoms/ionized particles that were previously in the outer periphery would be transferred to this central core. This would result in high levels of energy (via “exploding” photons and fusion) being produced within a very small central core. Since the physical area of the central core is so small (in relevance to a main sequence star), the electrons (which are involved in the production of high energy photons) would have their “freedom of movement” greatly constricted (once again, when compared with the main sequence). This would increase the probability that a certain portion of the electrons would be simultaneously accelerated in the same direction so that a sufficient number of photons released their energy at the time of their emission. If these photons were sufficient in magnitude, this may result in the explosion of the star. However, the probability of a sufficient number of electrons being accelerated in the same direction so as to induce the release of a photon’s internal energy, would be phenomenally low, even when dealing with a constricted space such as might be found within the core of a star which is in transition. Furthermore, in making the transition from main sequence to red giant, if the hydrogen left in the star was negligible, this would explain why there is no hydrogen in the spectrum of a supernova type I.

Consequently, *if* (a) my analysis on light in the physics section is fundamentally accurate; and (b) my analysis in The Primary Source of Stellar Energy is fundamentally accurate, then this model of supernova type I is a superior description of nature as it explains why there is no hydrogen in the supernova's spectrum, and provides some indication of why the event is so phenomenally rare.

In this analysis, an important question has gone unanswered. What percentage of photons would be required to induce this explosion? At this stage it is unknown. One factor that would have bearing on this would be the mass of the star. The greater the mass the greater the number of photons required in order to "blow the star away". Furthermore, precise calculations cannot be implemented until the numerical value of the constant in $E = I_{(c)}$ (CONSTANT) was ascertained.