A NEW MODEL OF QUASARS

The reader may wonder if we truly need a new model of quasars. Unlike the paper on supernova type I (in which a need for a new model was outlined), we may not *need* a new model of quasars per se. From all outward appearances, the concept of an accretion disk around a black hole would seem to explain the observed facts. Although there may not be a *need* for a new model, the development of new science in one area may result in the development of new science in another area (as was explained in the paper, The Primary Source of Stellar Energy). It is as a *direct result* of the paper pertaining to the origins of the universe that a new model of quasars is being developed. It is this specific paper which can illuminate the genesis and development of quasars and the two primary facts pertaining to them (their extreme energy and their enormous distance from us). Furthermore, an argument can be developed to explain the judiciousness of pursuing a new model. Quasars are unlike any other astrophysical phenomena that we are cognizant of. Consequently, wouldn't it be wise to explain the phenomenon in terms of science that is "outside of our normal domain". In other words, the explanation would not conform to conventional scientific precepts in the same way an accretion disk around a black hole conforms to normal scientific principals. An accretion disk around a black hole is a phenomenon which is fairly common to our theoretical models. Although the new model would not violate any known laws of physics, in all probability it should be contrary to our conventional theoretical models. The development of such a model would seem to be the judicious course of action given the fact that quasars are completely unlike other astrophysical phenomena that we are familiar with. Secondly, does an accretion disk around a black hole explain the precise reason that quasars are the most distantly observed objects? Although arguments have been developed to explain this fact, this new model will explain this fact in a vastly superior manner.

In the following analysis, it will be presumed that the reader is familiar with my paper on the origins of the universe. The genesis of quasars was at the time the *initial* state of fusion was achieved within the core of the conglomerate of hydrogen gas from which the universe originally arose. In order to render the explanation slightly more lucid, let's review some first year physics. If a stone is tied to a string and the stone is swung around our heads, what will happen to the stone if we cut the string while the stone is being swung around? It will fly off in a direction that is at an approximate right angle to the point at which it was cut. In the birth of the universe, when the initial state of fusion was achieved it would have been the approximate equivalent of cutting the string as was just outlined in the previous example. In whatever area of the initial conglomerate where fusion was achieved, that physical area would have stopped rotating. Therefore, when the initial state of fusion was achieved within the core, that particular area would have ceased to rotate. Within that core, helium and energy would have been present. The helium atoms on the *outer periphery* of the core would have acted in the same manner as the stone on the string. They would have flown off in a direction that was at an approximate right angle to the point from which they were at. However, it would not only have been a helium atom which flew off, but an incremental amount of the energy created during the initial state of fusion. Therefore, what would have started to propagate through the rest of the hydrogen conglomerate was a helium atom within a very small "bundle" of energy (since we are dealing with the outer periphery of the entire central core, a myriad of such entities would have been propagating throughout the entire conglomerate). However, during these early stages, this helium/energy would *not* have been propagating just through the hydrogen. If the reader recalls the details of the paper on cosmology, once the initial state of fusion was achieved, there was an outward expanding sphere of energy. To be precise,

once heat was initially produced, the heat expanded outwards and induced fusion within the next "layer" of hydrogen. This initiated a "snowball" effect which resulted in the previously referred to outward expanding sphere of energy. Therefore, the helium/energy which flew off from the central core would have been propagating through this expanding sphere of energy *in the early stages* of the birth of the universe. When the helium/energy was propagating, there are cogent reasons for believing that it would have been rotating during the course of its propagation. Those reasons will not be fully addressed now, but will be explained in subsequent stages of this paper. As it was propagating, its rotational motion would have resulted in the "absorption" of more energy. This "mechanism" would have been achieved via a centripetal force which would have resulted from the rotating helium/energy. When additional energy was absorbed, this would have resulted in two effects. Firstly, the (initially) small vortex would have become larger. Secondly, two other "qualities" associated with the vortex would have increased as a result of the increase in energy. The rate of rotation of the vortex would have become faster. The other increase in speed would have been the overall speed of propagation in the outwards direction from the core. As this vortex propagated outwards, not only would it have absorbed more and more energy via a centripetal force, it would also absorb more helium. The *initial* absorption of the helium would not have been via a centripetal force as it was with the energy. The vortex would simply propagate through a physical area rich in helium (as a result of the outward expansion of fusion), and absorb the helium. The helium would *subsequently* become part of the vortex as it was subjected to the rotating force of the energy. Once the helium was absorbed, it would naturally increase the mass of the vortex.

Thus far, the initial genesis of quasars has been explained. In order to effectively proceed with the explanation, certain factors pertaining to the conglomerate of hydrogen gas which gave birth to the currently observed universe must be clarified. When the sphere of fusion was expanding outwards, there were two "energetic forces" propagating in an outwards direction. One was the sphere of fusion and the other were these (initially) tiny vortices of helium/energy. In the beginning, the sphere of fusion would have been propagating faster than the vortices of helium/energy. However, as time went on, the vortices would have absorbed a greater amount of energy and become increasingly faster both in its rotational speed *and*, more importantly, in its outward rate of propagation. (The reader may feel that this would not necessarily be true as the additional absorption of helium would have added mass to a vortex and negated the increase in speed. This is true to one extent or another. However, in the final analysis, the continually increasing absorption of energy would have largely surpassed any "retardation in speed" induced by the helium and resulted in a net increase in speed.) Since its rate of outward propagation is increasing, there would be a point when it eventually surpassed the outward expanding sphere of fusion and moved ahead of it. At that stage, the vortices of helium/energy would propagate through the rest of the conglomerate which was comprised merely of hydrogen. What would transpire now? Obviously the hydrogen would be absorbed by the vortex with the following possible ramifications. The speed of the vortex (both in terms of rotation and outward rate of propagation) would not increase the way it did when it propagated through the physical area of helium and energy. If its speed did not increase, what would transpire? It is rather speculative as to what the future course of this vortex would be. There are two primary possibilities. The first possibility is that it would proceed to slow down since it is absorbing hydrogen and its mass is increasing. The probability of this scenario is low since it would not effectively explain the fact that quasars are the furthest observed astrophysical phenomena. However, there is a second possibility which would (eventually) explain this fact and, consequently, is the more viable possibility. The first possibility would only take effect if the overall energy level of a vortex was

insufficient *at the time it reached the physical area of hydrogen* to enable the hydrogen to achieve fusion within the vortex itself. The second possibility is that the vortex *was* sufficiently energetic to cause (at least a portion of) the absorbed hydrogen to achieve fusion. If this did transpire then that would entail the vortex gaining additional energy (via internal fusion). Therefore, there would be a careful balance between the slowing down via the gaining of more hydrogen/mass and the increase in energy via internal fusion. In the end, there is a high probability that there would have been a net increase in energy (and subsequently an increase in rotation and rate of outwards propagation), although the increase would not have been as dramatic as when the vortex was initially propagating through the energy and helium that was created when the expanding outward sphere of fusion preceded the vortices. Propagation of this nature (absorbing hydrogen and the internal energy increasing) would have continued until the vortex had "burst through" the conglomerate of hydrogen from which the universe arose and propagated beyond it.

In a previous part of the paper, it was stated that there would be explanations as to exactly why this vortex would have to be rotating from the very beginning. One reason has already been alluded to. In the beginning when these small vortices were propagating through the area comprised of energy and helium, there would have had to been a rotation so that the energy of this area could have been absorbed into the vortex via a centripetal force. However, there is an even more cogent reason for considering the rotation of these vortices. As they propagated through the conglomerate of hydrogen, the energy contained therein must have reached absolutely phenomenal proportions. Secondly, as they absorbed helium (and subsequently hydrogen), they must have become very massive. What is the most "reliable" way to contain such a phenomenal level of energy? *Through a very high rate of rotation which induces an extreme centripetal force.* This would have prevented the energy from "dissipating" away as the energy would have been focused in a central direction. Furthermore, the vortex would not have "divided" (as in the case of binary stars) despite the fact that much of the mass (atoms) would have been thrown to the outside edges of the vortex. It would not have divided as a direct result of the energy being so strongly directed towards the centre thereby rendering division impossible. Since we are dealing with such a phenomenal level of energy (which was continually increasing as it propagated through the conglomerate of hydrogen), the rate of rotation must have been (and continues to be) very high. The rate of rotation is probably close to relativistic speeds. Only such a high rate of rotation would be able to contain such phenomenal levels of energy.

Now that a high rate of rotation has been effectively incorporated into the theory, other factors must be stated as it pertains to the internal energy of a quasar. One of them can be explained as follows. In the paper The Primary Source of Stellar Energy, it was theorized that a photon's intrinsic energy was the primary source of stellar energy with fusion being relegated to a secondary source of energy. Once a certain condition was established within a quasar, photons would also be the primary source of energy. It would have to be hot enough within the quasar to cause a high rate of acceleration of free electrons in order to produce an inordinate number of high frequency photons. These photons would have been high energy X-ray photons. This is for the simple reason that for main sequence stars, the internal energy is only sufficient to induce a rate of acceleration which would produce photons of this energy. However, with a quasar the situation is slightly altered. Given the phenomenal amount of internal energy within a quasar, free electrons would have been accelerated to the point that they produced high energy gamma ray photons (in contrast to low energy gamma ray photons). This entails that when the gamma ray photons released their internal energy (via the process described in The Primary Source of Stellar Energy), more energy would have been released as compared with the release of energy from a high energy

X-ray photon. This would be yet another factor to differentiate between the energy of a quasar and the energy of stars.

Although the following does not elucidate on the more substantial internal energy of a quasar, it must, nevertheless, be dealt with. Namely, the exact "mechanism" by which photons release their internal energy within quasars would be slightly different than in the case of stars. In the case of stars, two primary states of motion were considered when assessing the final state of motion, at a particular instant, via a vector addition. This was the star's orbit around the galactic centre and the galaxy's overall state of motion. The star's rotation around its own axis was considered negligible and was therefore disregarded. In the case of quasars, the situation is completely different. There is no galactic motion to consider and a quasar obviously does not orbit around a galactic centre. The other critical difference is that a quasar has a very high rotational rate which is not negligible in relation to a photon releasing its energy. Therefore, what factors must be considered when assessing if a photon, at the time of its emission, is propagating in a direction opposite to the overall state of a quasar's motion *at a particular instant*? A vector addition must be made with regards to two states of motion of the quasar. One is the rotational rate of the quasar. The other is simply the overall propagation of the quasar. When assessing these two rates of motion, there would be two slightly different calculations which would have bearing on whether a photon releases its internal energy or not and, subsequently, the overall energy level of the quasar. The first calculation pertains to the quasar when it was propagating through the conglomerate of hydrogen gas. The second pertains to when it burst free from this conglomerate. The latter would obviously have a higher rate of movement (in regards to both its rate of rotation and its outward propagation). This would have resulted in the quasar having more internal energy as a *slightly* lower frequency photon may have reached the state where it "exploded" due to the higher overall rate of motion.

In this new model of quasars, yet another component must be incorporated into the model that has not been incorporated into the previous models of stellar energy. This new component pertains to photons emitted by *protons*. Previously, photons from protons did not have to be taken into consideration when analyzing stellar energy as protons are significantly more massive than electrons thereby resulting in a slower rate of acceleration when they are subjected to the same energies that electrons are subjected to. This entails very few (if any) photons being produced from protons when dealing with main sequence stars. However, with quasars the situation, in all probability, changes quite dramatically. Prior to stating the nature of the change, it would be judicious to emphasize the following. Since quasars are the most distantly observed phenomena, we cannot be absolutely certain about our empirical observations. Consequently, the following is meant to be a probabilistic interpretation of our data as it pertains to quasars. The internal energy produced by quasars is so phenomenal that the free protons (from ionized hydrogen) would, in all probability, be accelerated to a sufficient extent to produce high frequency photons. These high frequency photons would not have to be low energy gamma rays to release their energy. They could, as stated in the paper The Primary Source of Stellar Energy, be high energy X-ray photons. If high frequency photons were emitted by protons in such a manner as to release the photon’s internal energy (in the manner described in the previous paragraph), this would significantly contribute to the quasar’s overall energy. This would be another differentiating factor between the internal energy of a quasar and the internal energy of main sequence stars.

Let's examine this model in terms of the known facts of quasars. From all outward appearances, there are two primary facts which must be explained when attempting to develop a theoretical model of quasars. One is the phenomenal level of energy contained within such a

"small" (relatively speaking) area, and the second is that they are the most distantly observed phenomena. In accordance with this model, they would be the most distantly observed phenomena as they (eventually) propagated ahead of the expanding sphere of fusion which gave birth to our observed universe. When they propagated ahead of the expanding sphere of fusion, it's inevitable that they would be the most distantly observed phenomena. Does this model successfully explain the phenomenal levels of energy they emit? When they propagated through the conglomerate which gave birth to our universe, they first absorbed energy and helium and subsequently hydrogen which, through fusion, was converted to internal energy. Furthermore, it went through *billions* of light years worth of hydrogen before it finally emerged from the conglomerate. However, fusion is a secondary source of energy for stars and quasars. There would be an inordinate amount of matter within the quasar, and subsequently a phenomenal number of electrons which are subjected to high rates of acceleration. Furthermore, due to the phenomenal level of internal energy within a quasar, protons would also contribute to the energy since they would be accelerated to a sufficient extent to release high frequency photons. This would be in contrast to a main sequence star. Consequently, there would have been an inordinate number of high frequency photons which propagated in the "right" direction so that their energy would have been released. All of these factors would easily account for the phenomenal energy of quasars. What about the "small" area they occupy? Since their intrinsic energy was so high, there would have been an extremely high rate of rotation. Specifically, a rate of rotation which was close to relativistic. This would have induced tremendous centripetal forces which would have condensed this energy to a phenomenal extent. Therefore, the known facts have been explained.

Furthermore, there is an additional "attractive" element to this model which the existing model does not possess. The existing model relies on an accretion disk around a black hole , a concept which is very "normal" to our theoretical models. From all outward appearances, it would seem far more judicious to rely on a theoretical model which is outside of our conventional framework given the fact that quasars are such a highly unusual phenomenon. The model outlined conforms to these parameters.