Quasars

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Quasars are the end product of the evolution of black holes. In order to understand quasars, then, the nature and evolution of black holes must be elucidated. Simply put, a black hole is a mass large enough and compact enough that radiation cannot escape and is therefore a gap or hole so far as radiation is concerned. That is to say, there is an event horizon surrounding the black hole. It is the practice to conceive of a black hole as a singularity, a concept that needs further consideration.

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Various calculations have recently been solved by ad hoc modifications without a clear explanation. The solution of equations in quantum electrodynamics were leading to troublesome infinities until Feynman and others renormalized them. They arbitrarily stopped the calculations a tiny bit short of zero and then everything fell into place. Another problem has to do with cosmic motions where calculations indicate far more mass than can be observed. This has led to the proposal of dark matter, an otherwise undetected form of mass that then would make up most of the universe. Alternatively, Milgrom has proposed a modification of Newtonian dynamics (MOND) that changes the second law of motion at extremely low values. The change eliminates the need for dark matter. Finally, in calculating the effects of colliding black holes results were impossible until Baker and Lousto decided to end the calculation just short of the theoretical end point. As a result infinities were avoided. All of these examples are dodging a zero or its inverse, infinity. The problem is that the standard equations initially used all start at zero because ultimate matter has been assumed to have no dimension, that is, a singularity. Ultimate matter does have a dimension (anons). Correct equations require taking this into account. In fact, the invention of “inflation” to accommodate the mathematics of big-bang theory may yet be another example of the need to accommodate the reality of matter dimensions. The assumption of the existence of singularities may well be the biggest mistake that modern physics has made.

Black holes are not singularities. At something like twenty times their minimum size, neutron stars become swallowed by the event horizon. Black holes are just large neutron stars. Indeed, to crush neutrons further would produce pure energy that would then disperse and obviously this does not occur.

Because radiation cannot escape a black hole; because gravity is an external force; and because net magnetism tends towards zero, black holes constantly accumulate energy in the form of radiation, mass, momentum, of everything that comes their way. Between the event horizon and the neutron body is a seething cauldron of radiation generated by the super-heated body. This envelope is a veritable matter factory, spontaneous generation (and destruction) of matter taking place at a furious rate. Some of this matter slams into the surface to become more neutrons, adding to the overall mass growth. But the apparent mass of a black hole is deceptive because the density is such that the interior is sequestered from external gravity. Black holes at the center of galaxies contain far more matter than their observed mass suggests.

There are limits to the size of a black hole. It can get very large; at the centers of super galaxies the super black holes sequester the equivalent of several ordinary galaxies. An extraordinary accumulation of heat together with the generation of a significant intensity of radiation pressure is achieved. The interplay between the external gravity and this internal energy is not constant, however. Gravity grows merely at the square (surface) of the body while the internal energy grows at the cube (volume). Eventually, but only in super galaxies, the internal energy accumulation overwhelms the external gravity and the body becomes unstable. Finally, an eruption occurs. Evidently the size of the body is such that an exploding segment separates off before involving the whole body. If the explosion initiates deep towards the center, it divides in two, blasting out on opposite sides of the body. Arp (1998: Seeing Red) has documented exploding hot blobs blasting out from super galaxies. These blobs are called quasars. Even though they are exploding, they are yet so dense that they impart a significant red-shift to emitted radiation and are thus much closer than calculations of distance made based on the red-shift alone (Arp). Their red-shift is not all cosmic red-shift.

The birth of a quasar is a momentous event. Its neutrons are flying apart, eliminating the links that kept them stable while they were part of the body of the black hole. Within minutes, like all free neutrons, they decay. Because of the great exiting speed of the escaping quasar at this moment, the vast majority of the decay products are matter. The smaller amount of anti-matter immediately collides with matter and is destroyed releasing a flash of radiation, mostly gamma rays. Eventually the quasar cools down, atoms form, and it becomes another young galaxy. The evolution of the quasar resembles the theoretical evolution of the big-bang universe, producing the predicted amounts of hydrogen, deuterium,

helium and so forth.

The production of quasars completes the steady state cycle of the universe. Matter and radiation accumulate in black holes only to be balanced by the expulsion of the same in the birth of quasars. The matter and anti-matter generated within black holes are balanced by the destruction of anti-matter with matter at the birthing. A portion of radiation energy is converted into gravity by the cosmic red-shift balancing that which is lost into black holes. Obviously, the quasar ends up being made entirely of matter. Quasars escape from the cluster of galaxies of their birth but eventually are captured by another cluster somewhere else.

Space as a whole has an average temperature-background radiation. Lerner (1992: The Big Bang Never Happened) has shown that the smoothness of the background radiation is a local plasma effect. There never was a big-bang, only a series of little-bangs when quasars are born.Article Keywords: Black hole, Renormalization, Dark matter, MOND (modification of Newtonian dynamics), Singularity