The Secret Lives of Quasars

Ever since they were first discovered, the true nature of quasars has long been one of the most difficult paradoxes in cosmology and astrophysics. There is nothing in the initial assumptions of the Big Bang and Relativity theories that would lead to the creation of quasars. Also, the principles of quantum mechanics offer no solutions to the gigantic energies that quasars are purported to produce. The experimental observations of over two thousand quasars leads to a firm conclusion that all of these peculiar stars reside within the Milky Way.

Quasar Parameters

Quasars were first observed and identified as very dim stars with spectral photons that had redshifts that were many orders of magnitude greater than any Doppler shifts observed in the Milky Way or other nearby galaxies. In fact, the only galaxies with red shifts as large as quasars were located billions of light years away in the far reaches of the cosmos. Big Bang cosmologists made the metaphysical assumption that the extreme red shifts of quasars and distant galaxies were direct Doppler shifts caused by the imagined enormous outward linear momentum caused by the Big Bang singularity. They did not imagine that the quasar shifts could be the transverse Doppler shifts of radial gravitational momentum because they believed that gravitational momentum could not produce transverse Doppler effects because it was only “equivalent” to “real” momentum.

Because of their unquestioned acceptance of the equivalence principle, Big Bang and relativity theorists are forced to conclude that the extreme red shifts of quasars are caused by the high recessional momentum of an expanding universe instead of just the real measured gravitational momentum of atoms at a star’s surface.

This extremely large outward linear momentum led to the problem of a quasar’s enormous energy. Even though quasars are very dim compared to stars in the Milky Way, if they are really many billions of light years away, then they would have to be many orders of magnitude brighter than whole galaxies to even be seen.

Super Luminal Velocity of Quasars

Both Newton’s laws and Einstein’s assumptions of motion are violated by the enormous transverse velocities of some quasars that have been calculated to move sideways at velocities that are orders of magnitude greater than the speed of light. The Living Cosmos principle of stelar evolution leads directly to quasars and “black holes” as the very largest stars in the evolutionary process. The Living Cosmos would have predicted the existence and nature of quasars had they not already been observed. It is concluded that quasars are very large and very dim stars that exist throughout the Milky Way. Also, they are so dim that they have not yet been observed in other galaxies.

Once the imaginary and unmeasured idea of the equivalence principle is abandoned and measurements of gravitational momentum are taken at face value, most of cosmology's difficult problems and paradoxes simply disappear. This is particularly true when it come to quasars. The principles of the Living Cosmos lead directly to the creation of quasars and to a simple explanation of the true nature. In short, quasars are very large ordinary stars that appear very dim. We need not look for them outside our own galaxy because they would be too difficult to see. The largest of quasars are so dim from our perspective that they become invisible black holes.

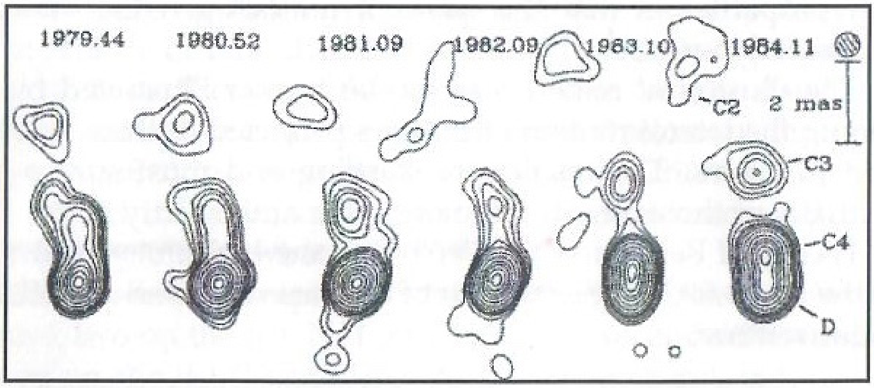

Figure 24: The angular separation from 1979 (left) through to 1984 (right) of host and ejected material in the quasar system 3C 345, measured by John Biretta. The direct linear rate of departure is a function of remoteness, by simple trigonometry. (Image courtesy of Dr Y P Varshni and John Biretta, STScI).

The prime example of a quasar that must reside in the Milky Way is Quasar 3C 345. This a multiple body quasar system that was observed moving apart over a period of five years. With a red shift of z = .549, equivalent momentum relativity cosmologists are forced to conclude that 3C 345 is 5.5 billion light years away. If this is true, it would mean that the components of this quasar system were moving apart by at a velocity at least 7 times greater than the speed of light. However, if 3C 345 resides in the far side of the Milky Way about 75,000 LY away from Earth, the separation velocity would be calculated to be about 30 km/s. At 5.5 billion LY away, 3C 345 was as bright as a dozen galaxies but here within the Milky Way, you need a very good telescope just to see it. Several other quasar systems have been observed with far greater superluminal angular separation velocities but if these are all within the Milky Way, instead of at the ends of the universe, their proper motions would be in keeping with normal stelar motions within galaxies.

It is a conclusion of 3C 345 measurements that this quasar is located in the Milky Way. If its extreme red shift is not caused by extreme distance, it then follows that all quasars are located in the Milky Way because they are way too dim to be easily identified in other galaxies. If one quasar exists in our galaxy, it follows that their common characteristics would require that they all reside in the Milky Way. Despite their larger size, quasars get dimmer and dimmer the higher their red-shifts. This has to do with extreme gravitational momentum.

Linear Momentum vs Gravitational Momentum

There are two opposite Doppler shifts measured in astronomy. The direct Doppler shift of the relative linear momentum of stars and galaxies and the transverse motion Doppler shifts of both linear and gravitational momentum. Direct shifts can be red or blue but transverse shifts are always red on emission and blue on absorption. As stars become more massive, the increase in their upward gravitational momentum causes their spectral photons to be transverse shifted to red. This shift is non-directional and has the same value in all directions. All photons are transverse red-shifted by the measured gravitational escape/surface velocity at the star's surface. As we measure larger and more massive stars, we see that their gravitational velocities can become a significant fraction of the speed of light. This causes the star to emits spectral photons that are highly transverse red shifted.

The Belief that Quasars Do Not Exist Today

Perhaps the most difficult thing about quasars for Big Bang theorists to explain is their belief that quasars only existed in the early stages of the Big Bang creation. They are unable to imagine the physical processes by which quasars were formed nor what would make them disappear from early galaxies and never to form again. Why are there no quasars in the inner galaxies? The answer to this is that quasars form like any other stars and exist sprinkled throughout all galaxies. They are just too dim to be seen outside of the Milky Way.

Quasars radiate spectral photons exactly like any other stars. Quasar light consists of the same spectral photons that have been transverse red shifted by extreme gravitational momentum. As quasars get very large and massive, their atomic interactions are slowed by time dilation caused by Lorentz transformations of gravitational momentum. Larger and larger quasars become dimmer and dimmer to the observer both because they are emitting increasingly red shifted photons with less and less energy and because atoms are also emitting photons at a slower and slower rate so that the overall star is producing less and less heat energy. This is the same absolute radial gravitational momentum that is measured in the Pound-Rebka experiment and GPS clock measurements.

When a quasar is so massive that its escape/surface velocity approaches the speed of light, its gravitational momentum becomes enormous. Atoms emit photons that are transverse red-shifted by this momentum ($\lambda' = \lambda/\sqrt{1-v^2/c^2}$). For example, if a quasar's escape/ surface velocity is 1/2 the speed of light, the atoms at is surface would increase in linear Energy/Mass = c^2. The photons transverse shifted by this momentum would have a Mass of M = .87, a wavelength of λ = 1.15, a momentum of p = mc = .87, and an Energy of ($E = Mc^2/2 + MC^2/2 = McC = .87$). Clocks on the quasar's surface would be slowed to intervals of ($t = T/\sqrt{1-v^2/c^2} = 1.15$).

Photon Electrodynamics

The actual physical mechanics of what happens to the emitting atom as it gains momentum is a function of the Lorentz transformation. As the electron's Energy/Mass increases with greater gravitational momentum, the Bohr radius increases by a proportional amount and this causes the atom to emit photons with longer wavelengths. The wavelength of an atom's emitted spectral photons $\lambda = 4\pi a_o/\alpha$ are increased by the electron's increased mass from its gravitational momentum. This in turn is caused by conservation of electron and photon angular momentum ($I\omega = M_E a_o \alpha C = m\lambda C/2\pi$). This same mechanism of increased electron mass produces the Hubble shift. Ancient spectral photons have longer wavelengths because they were emitted by electrons that were more massive than today's electrons. The 2.7 K cosmic blackbody photons were produced when the electron/proton mass ratio was e/p = 1/146.

Equivalent Force and Momentum

The simple reason that General Relativity cosmologists are not able to account for the measured properties of quasars lies in their unquestioned belief in the metaphysical assumption of the equivalence of gravitational force and momentum. They believe that measured gravitational momentum is not real and therefore cannot produce a Lorentz transformation. This unmeasurable assumption imagines that the direction of the equivalent gravitational momentum of falling bodies points down. This leaves the quasar with very little intrinsic gravitational momentum to transverse shift its atomic emissions. In the Living Cosmos, the true measured vector of gravitational momentum is up and the whole surface of the star has the extra absolute radial momentum necessary for its atoms to emit red-shifted photons according to Lorentz transformations. Lorentz transformations are always produced by absolute momentum and never by equivalent momentum. For example, the increasing equivalent momentum of a falling clock does not slow its rate. Only when the clock conserves its momentum with Earth does its clock begin to slow. This slowing begins to occur when the falling clock enters the atmosphere and then increases when it opens a parachute. Its rate becomes constant when it lands and acquires the upward momentum of Earth's surface.

Quasar Rotation

Another feature of quasars that has never been explained by standard cosmology theories are the many observations of individual quasars that show not just one red shift for the whole star but a range of related red shifts. These varied values are what would be expected in the Living Cosmos description of quasar dynamics.

Varying red shifts can be explained quite easily with quasar rotation. Consider a quasar with an escape/surface velocity of .5c and and a transverse red shift of 1.15. If it was rotating on its axis at a velocity of .1 c, it would produce direct Doppler blue shifts of -.01 on one side and red shifts of +.01 on the other. Measured shifts from the approaching side would be $\lambda = 1.14$ and $\lambda = 1.16$ on the receding side. The center would still have a shift of $\lambda = 1.15$.

The Torus Shape of Quasars

One aspect of quasars that has been very difficult for relativity theorists to explain is the observation of some quasars that periodically change their brightness over a period of just several days. This is explained by the shape of quasars. When these extremely large and massive bodies rotate at high velocities approaching the speed of light, their decelerating gravitational force pulls them first into a disk shape and then into a torus where the quasar's center of gravity is far removed from its actual physical structure. While these donut shaped bodies are spinning very rapidly like a wheel, they can also slowly rotate on a perpendicular axis. This allows the observer to periodically see the full face of the torus shape and then see just its edge. The would allow the observer to see a periodic change in a quasar's brightness even though it remained unchanged.

Relativistic Dimming of Quasar Light

Quasars are the largest and potentially brightest stars in the Milky Way. However, when we observe them, they are very much dimmer than than the stars surrounding them. The reason for this has to do with the electrodynamics of photon emission. When atoms are at rest and have zero momentum, the probability that they will emit spectral photons in any particular direction is even. Then when they are accelerated to a substantial momentum, the probability increases that more photons will be emitted on vectors closer to the atom's momentum vector. This effect is negligible for ordinary velocities but for velocities approaching the speed of light, it becomes significant. Without resorting to complex quantum mechanical probability calculations, I will just say that for atoms on quasars with extremely high radial momentum the probability is extremely high that they will emit photons very near to their upward momentum vector and extremely low that photons will be emitted at right angles to it.

Atoms at the surface of quasars with extremely high momentum emit almost all of their photons within small angles of their up/down momentum vector and very few at larger angles. When we observe the sun, we see pretty much equal numbers of photons from every point on its disk. However, when we view a quasar, we mostly see only photons from a small region in its center and extremely few from its outer disk. Even though the quasar's center might appear bright, the light from the rest of its disk would be minimal because these photons were emitted straight up and not in a line of sight with our telescope.

From Quasars to Black Holes

The enormous red shifts of photons from quasars are not direct Doppler shifts of receding momentum as is commonly assumed. Rather they are enormous transverse Doppler shifts produced by the high escape/surface velocities of very large stars. These transverse shifts are caused by the slowing of time resulting from escape/surface velocities that are substantial percentages of the speed of light.

Even though they are very large, quasars also appear quite dim compared to smaller stars and get dimmer and dimmer the larger they get. They emit spectral photons of greatly reduced energy due to transverse shifts caused by increases in electron mass from Lorentz transformations. Also, these photons are greatly reduced in intensity due to the slowing of inertial time. A third factor in dimming is the reduced temperature at the quasar's surface. The very largest quasars, with escape/surface velocities V_{es} very near the speed of light, become so dim from transverse shifts, and the slowing of time that they are very difficult to observe. When quasars become too dim to observe they are called black holes.

Conclusions

Even though quasars are intrinsically quite bright like other stars, they appear extremely dim for three reasons.

1. The transverse red shifts of their photons greatly reduces their energies.
2. The transverse slowing of time by high gravitational momentum reduces the intensity of the atomic emissions of photons.
3. We only see photons emitted near to gravitational momentum vectors. We can see photons from near a quasar's geometric center but most of the photons emitted from the rest of its surface are directed straight up and away from Earth.

For the above reasons, all of the 2000 or so carefully measured quasars must reside in the Milky Way. Even though they are intrinsically bright, they are observed to be very dim and would be extremely difficult to isolate in other galaxies. The fact that we have yet to observe any quasars in Andromeda supports this conclusion and the discovery of a quasar in that galaxy would validate it.