

Curtis Eickerman  
4114 E. Windsong Dr.  
Phoenix, AZ 85048  
Tel: 480.706.6174  
Curtis.Eickerman@cox.net

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### We Live in a Black Hole

"Something caused all this. But what caused... that cause?"

Dr. Hans Reinhardt, *The Black Hole*, 1979

There is a fundamental problem with the idea of "The Big Bang" as it is generally thought of in regard to the creation of the universe as we know it. The problem is that the Big Bang has to abide by the very rules of the universe in which it exists while violating those rules at the same time.

The basic concept of the Big Bang is that everything that makes the universe what it is today exploded into the universe from an infinitesimally small point of near infinite density. In a sense this would be a description of the ultimate black

whole where all the mass of the universe is contained within a singularity.

A problem with this concept is that for the singularity to "explode" into a universe it has to defy the laws of that universe which would not allow for anything to escape the gravitational grasp of the singularity. So the concept requires the explosion of something that can't explode. In addition it requires that an effect (the explosion) must take place without any cause thereby violating the most basic law of cause and effect (i.e., that any effect has a cause).

There is yet another problem with a Big Bang that happens at one point in time. A singular explosive event of the type postulated for the Big Bang would normally produce a hollow shell of expanding energy. As this shell expands and cools, matter will condense from the superheated plasma. This expanding matter will also have the appearance of hollow shell much like we see surrounding supernova in the universe today. So a Big Bang universe should have some central hollow area from which the universe originated. Yet the universe as we see it doesn't seem to have the expected appearance. Instead we have a uniformly filled universe that doesn't seem to have a notably hollow center.

A universe developed through "Continuous Creation" might explain the lack of a hollow center to the universe, but this

too has a problem. Continuous Creation would imply one or more White Holes but we have yet to locate any of these. Yet the whole idea of Black Holes that is so widely accepted virtually mandates that there must be White Holes somewhere.

To understand this better we should consider the basic characteristics and behavior of a Black Hole.

In the initial creation of a Black Hole a sufficiently massive star runs out of the fuel necessary to cause internal pressure to resist gravitational collapse. When this happens the star shrinks, density increases, and ultimately the gravity at some point creates a situation where the escape velocity from the massive object becomes greater than or equal to the speed of light. This creates what is known as the Schwarzschild radius beyond which we cannot probe the inner workings of a Black Hole (the radius at which even light cannot escape). More matter continues to fall into the created Black Hole, increasing the amount of swallowed mass, increasing the Schwarzschild radius, and also increasing the appetite of the Black Hole for still more matter. These days we generally accept that there are Black Holes with the equivalent of millions of solar masses at the heart of galaxies. In addition there are whole groups of galaxies that are engaging in a "dance of death" that will result in them swallowing one another with the inevitable merger of their respective Black Holes.

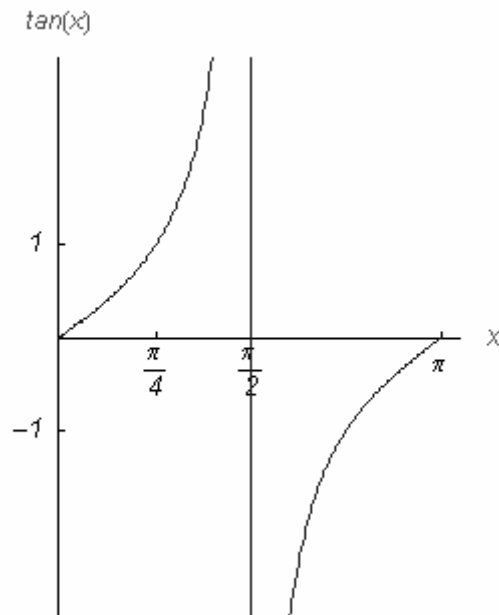
If we were able to directly observe matter falling into a Black Hole we would notice something that doesn't seem logical. As matter falls into a black hole it appears to never actually reach the Schwarzschild radius but is frozen in orbit on the near side of the radius. That is, the matter will appear to never enter the Black Hole. An interesting side effect is that Black Holes don't "look" black.

To understand this we might do well to imagine water going down the drain in a wash basin. The water swirls down the drain going faster and faster as it nears the drain. However, if this drain were a Black Hole the water would be accelerated up to exactly the speed of light at the Schwarzschild radius which is exactly the speed necessary to maintain orbit. So, from our perspective, the matter would appear to never leave the Schwarzschild orbit. However, as the matter accelerates to the speed of light time stops for the matter reaching the Schwarzschild radius. As a result, what for us seems like eternity to cross the boundary seems like no time at all for anything that crosses the boundary.

At the Schwarzschild radius, the rules that govern the behavior of objects in our universe break down. However it is just possible that immediately on the other side of the Schwarzschild radius things begin to make sense once again. This possibility is not all that unusual. Mathematically we

experience such situations all the time. A simple example of this would be a graphical representation of the tangent of an angle.

The tangent of an angle is defined as the sine of an angle divided by the cosine of an angle (i.e.,  $\tan \theta = \sin \theta / \cos \theta$ ). At an angle just short of 90 degrees the tangent is an extremely positive number. However at an angle just past 90 degrees the tangent is an extremely negative number. Also, at exactly 90 degrees the tangent is simply undefined because the mathematics used simply break down (division by zero is not allowed). This is analogous to what happens at the Schwarzschild radius of a Black Hole, and might even be more analogous than we might first expect.



If we look at tangent curves on both sides of 90 degrees ( $\pi/2$  radians) we see what appear to be negative mirror images of each other. So, what if the same thing happens at the Schwarzschild radius of a black hole? What might this mean? Unfortunately direct observation fails us. However, the implication of the tangent analogy is that inside of a Black Hole time, as observed by someone outside, would appear to be moving backward. Also, the inside of a Black Hole is a mirror image of whatever is external to the Black Hole. As a result the external observer would see matter crossing the Schwarzschild radius but not appearing just inside of that radius, but appearing at the center of the Black Hole as it spews from a central White Hole that expands toward the inner edge of the Schwarzschild radius.

But what does this mean?

It may mean that every Black Hole contains a duplicate of the universe external to the Black Hole but a universe that is running in reverse. As an outer universe is collapsing an inner universe is simultaneously expanding. These internal and external universes exactly match at the Schwarzschild radius but their time is running in opposite directions. Also, to anyone within such a universe time would seem perfectly normal because the observer would also be running in reverse time relative to an outside observer. In fact, to the occupant of a Black Hole

universe, anyone outside of the Black Hole would appear to be running in reverse.

So how does all this relate to the creation of the universe?

What it implies is that our universe could have come into being as a result of the creation of a Black Hole in a predecessor universe. The end point of the predecessor Black Hole became the starting point of what was essentially our White Hole. Earlier points in time of the predecessor Black Hole represent points at which it had not swallowed everything and would correspond to points in time where our White Hole had not finished spewing out everything. Our universe at the end of its time will be approaching the inner shell of the Schwarzschild radius of our predecessor Black Hole. But this leads to a rather mind boggling situation.

If the universe as we know it happens to have enough mass to cause its eventual gravitational collapse into a single final ultimately massive Black Hole, then there are an infinite series of these back holes in the past and in the future. This is because all Black Hole/White Hole combinations have to identically match at the ultimate interface point which means that an infinite number of Black Hole/White Hole combinations must exactly intersect at the end/beginning of time forever.

The result of all of this is that no Black Hole has to violate the rules of the universe to give rise to the universe because we never escaped the Black Hole. We live in it. While our universe is running in reverse compared to the Black Hole that created it, the appearance to us is of having escaped from a relatively continuous White Hole that never exceeded the mass density that would prevent spewing energy into this universe. That White Hole originated with the gravitational collapse of a Black Hole in a predecessor universe so that our universe does have a cause rather than being cause-less. Also, the initiating event doesn't violate the laws of this universe by causing a Black Hole in this universe to have to explode. It also is not a one time event but one which continues over time thereby preventing the universe from being a hollow shell.

Though this theory addresses a lot of questions, there are some things that remain beyond our grasp. For example, the idea of each universe eventually giving birth to its successor doesn't tell us how the original universe (universe-zero) might have come into being. It also doesn't give us any way of telling how many generations from universe-zero we might have come into being. It also tells us that all generations of the universe exactly match in a negative time mirror image at the Black Hole Schwarzschild boundary, but it doesn't tell us how much these universes might deviate from each other away from the

boundary. That is, are all universes exactly identical at all points in time or just similar to a greater or lesser extent while only being identical at the boundary? This theory also suggests that there are an infinite number of universes simultaneously co-existing but it doesn't tell us what might allow us to slip from one universe to another (i.e. travel dimensionally between universes). It also doesn't tell us whether or not we might already inadvertently travel between universes and if this might explain lost time, alien abduction, and various situations that appear to be akin to time travel.

For every possible answer there also seems to be more than one new question remaining to be answered.