Explosion from Super-Massive Black Hole

Stephen J. Crothers

thenarmis@gmail.com

Email To: Professor Joss Bland-Hawthorn, Dr Ralph Sutherland, Dr Phil Maloney, Professor Martin Rees

Dear Sirs,

I write in response to the following University of Sydney online news article in which you all get a mention:

USYD – News: The dragon awakes - colossal explosion from supermassive black hole at centre of galaxy revealed, 24 September 2013

http://sydney.edu.au/news/84.html?newscategoryid=2&newsstoryid=12387&utm_source=console&utm_medium=news&utm_campaign=cws

You talk of a supermassive black hole at Sgt A* that erupted some 2 million years ago with a huge emission of radiation. Professor Bland-Hawthorn is quoted in the article thus:

"*The realisation that these black holes can switch on and off within a million years, which given the universe is 14 billion years old means very rapidly, is a significant discovery.*

"*There are lots of stars and gas clouds that could fall onto the hot disk around the black hole".*

Professor Rees is quoted in the article thus:

"*It's been long suspected that our Galactic Centre might have sporadically flared up in the past. These observations are a highly suggestive smoking gun*".

Furthermore,

"*Black holes, the most remarkable consequences of Einstein's theory, are not just theoretical constructs. There are huge numbers of them in our Galaxy and in every other galaxy, each being the remnant of a star and weighing several times as much as the Sun. There are much larger ones, too, in the centers of galaxies. Near our own galactic center, stars are orbiting ten times faster than their normal speeds within a galaxy.*"
[Martin Rees, Our Cosmic Habitat (2001)]

Upon what set of Einstein field equations and upon what solution thereto do you all rely for the "*lots of stars and gas clouds that could fall onto the hot disk around the black hole*" at "*our Galactic Centre*" in an expanding big bang universe that is "*14 billion years old*"?

What type of black hole do you allege at Sgt A*? Is it rotating or not, is it charged or not? The singularity of the alleged non-rotating black hole is a mathematical point –it has no extension and hence no volume, but it allegedly has mass (and infinite density). The singularity of the alleged rotating black hole is the circumference of a circle; not a circle mind you, only the circumference of a circle. It too has no volume, but allegedly has mass (and infinite density).

"… *there must be a singularity of infinite density, within the black hole*."

[Hawking, S. W., The Theory of Everything, The Origin and Fate of the Universe, New Millennium Press, Beverly Hills, CA, (2002)]

I also draw your attention to the following.

All alleged black hole universes:

(1) are spatially infinite

(2) are eternal

(3) contain only one mass

(4) are not expanding

(5) are either asymptotically flat or asymptotically curved.

The alleged big bang universes:

(1) are spatially finite (one case) or spatially infinite (two cases)

(2) are of finite age

(3) contain radiation and many masses, including multiple black holes (some of which are primordial)

(4) are expanding

(5) are not asymptotically anything.

The defining features of the black hole universe clearly contradict the defining features of the big bang universes. Consequently the black hole universe and the big bang universe are mutually exclusive – they cannot coexist. No mathematics is required to see this because it is a matter of elementary logic.

Hawking would have us believe that a black hole not only exists but disappears by quantum-mechanical evaporation. If so then a black hole universe transmutes into a non-black hole universe. What universe is that? Hawking has no set of Einstein field equations for a universe containing only Hawking radiation and hence no solution thereto. Moreover, Hawking maintains that his Hawking radiation universe exists in black hole universes because he alleges black holes all over the place, just as you do, all in some expanding big bang universe (which big bang universe do you allege?).

The big bang has a very peculiar nature:

"*One crucial assumption underlies the standard hot big-bang model: that the universe 'began' in a state of rapid expansion from a very nearly homogeneous, isotropic condition of infinite (or near infinite) density and pressure."*

[Misner, C. W., Thorne, K. S., Wheeler, J. A., Gravitation, W. H. Freeman and Company, New York, (1970)]

Now I ask you gentlemen, how close to infinite must one get to be "*near infinite*"?

Now Einstein's field equations are *nonlinear*. Consequently the Principle of Superposition is invalid in General Relativity. One cannot therefore superpose any alleged black hole universe upon any alleged big bang universe or upon any other alleged black hole universe. Similarly one cannot superpose any alleged big bang universe upon any alleged black hole universe or upon any other alleged big bang universe. One cannot superpose any matter and radiation upon any black hole universe or big bang universe in order to get stars and galaxies and accretion discs and jets and planets and multiple black holes, etc. To do so violates the mathematical structure of General Relativity. Let $\boldsymbol{X}$ and $\boldsymbol{Y}$ be solutions to Einstein's field equations. It does not matter if $\boldsymbol{X}$ and $\boldsymbol{Y}$ are the same or different. Let a and b be scalars. Then the linear combination $a\boldsymbol{X} + b\boldsymbol{Y}$ is not a solution to Einstein's field equations, because General Relativity is nonlinear. To amplify further, let $\boldsymbol{X}$ be an alleged black hole solution to Einstein's field equations and let $\boldsymbol{Y}$ be an alleged big bang solution to Einstein's field equations. Then the linear combination (i.e. superposition) $\boldsymbol{X} + \boldsymbol{Y}$ is not a solution to Einstein's field equations, it is not a universe, because General Relativity is nonlinear. Indeed, in this particular case $\boldsymbol{X}$ and $\boldsymbol{Y}$ relate to completely

different sets of Einstein's field equations and so they bear no relation to one another whatsoever.

However, superposition is precisely how you have generated a big bang universe with multiple black holes and stars and galaxies and radiation and accretion discs, and "*stars and gas clouds that could fall onto the hot disk around the black hole*".

Professor Joss Bland-Hawthorn speaks in this Youtube presented interview:

http://www.youtube.com/watch?v=ASAmYz8rZfQ

Herein he talks of black hole escape velocity. On the one hand it is claimed that the black hole has an escape velocity:

"***black hole*** *A region of spacetime from which the escape velocity exceeds the velocity of light*"

[Dictionary of Geophysics, Astrophysics and Astronomy, 2001]

"***black hole*** *A massive object so dense that no light or any other radiation can escape from it; its escape velocity exceeds the speed of light*."

[Collins Encyclopædia of the Universe, Harper Collins Publishers, London, 2001]

Yet on the other hand it is also claimed that nothing can even leave a black hole.

"*I had already discussed with Roger Penrose the idea of defining a black hole as a set of events from which it is not possible to escape to a large distance. It means that the boundary of the black hole, the event horizon, is formed by rays of light that just fail to get away from the black hole. Instead, they stay forever hovering on the edge of the black hole."*

[Hawking, S. W., The Theory of Everything, The Origin and Fate of the Universe, New Millennium Press, Beverly Hills, CA, (2002)]

"*The problem we now consider is that of the gravitational collapse of a body to a volume so small that a trapped surface forms around it; as we have stated, from such a surface no light can emerge*."

[Chandrasekhar, S., "The increasing role of general relativity in astronomy", *The Observatory*, 92, 168, (1972)]

Thus, the black hole is alleged to have an escape velocity and not to have an escape velocity simultaneously, which is impossible.

Upon what set of Einstein field equations and upon what solution thereto do you all rely for black hole escape velocity, bearing in mind that all alleged black hole universes contain only one mass and escape velocity is a two-body relation: one body escapes from another body, where there is no restriction placed upon the finite magnitude of the mass of either body.

In his interview Professor Bland-Hawthorn presented cartoons for visual impact and impression upon his audience and said that the alleged supermassive black hole Sgt A* has been growing since the big bang universe spawned the Universe. This black hole must therefore be a primordial black hole, not formed by the 'collapse' of a star, and it has not only grown all this time (14 billion years), it has not 'evaporated' into Hawking radiation to transmute a black hole universe superposed upon many other black hole universes and stellar universes all in turn superposed upon some big bang universe, into some non-black hole, non-big bang universe for which no Einstein field equations have been furnished, let alone a solution thereto.