

Black Hole Properties -Including, Three Event Horizons & NO Evaporation!

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ABSTRACT

This looks at black holes from a different viewpoint. The black holes and normal space are viewed as two parts to a single closed system.

the ideas are:-

[1] As electrons and protons have mass they cannot travel at the velocity of light. This would mean that there must be three event horizons.

(a) The electro-magnetic event horizon.

(b) The electron - positron event horizon

(c) The proton - anti-proton event horizon

[2] If a black hole is in empty space the only influence is that the pairs formed from virtual particles are pulled apart at the last two event horizons. The infalling particles will have more kinetic energy than the emitted particles.

From the $E = m * c^2$ equivalence principle,
the kinetic energy differences will add mass to the black hole.

[3] Infalling photons should gain energy from the gravity gradient and the “emitted” photon (Hawking radiation from inside the e - p event horizon) should lose energy because of the gravity gradient. Overall photons falling into the black hole would have higher photonic energy than the “emitted” photons.

the photon energy differences will add mass to the black hole.

[2] & [3] = The original mass of the black hole does not reduce! [Unless bombarded with antimatter!]

[4] Black holes have a massive “footprint” in our “normal space” [NS].

Because of this we must consider black holes & “normal space” together, as two parts of “closed system” both from a thermodynamic and a quantum point of view.

Properties in & around black holes, including polarisation [polarization] of the cosmic microwave background radiation, are considered from this new viewpoint.

Introduction

My previous report “Sphere Geometry of Forces & Fundamental Particles of the Universe” was very much in a “scientific report” type format.

As this is (mostly) looking at lots of different aspects of black holes from differing viewpoints a colloquium / seminar / lecture type format has been chosen.

Some of the ideas are on aspects that I haven't seen mentioned before; some are contradictory to the “standard view”; sometimes I get to a “standard view” that I didn't know about previously.

This is all offered in the spirit of

“Nothing is perfect” (There may be a better idea.)

“The more possibilities / choices there are to choose from, the more likely it is that the right choice will be made”

“The truths & facts speak for themselves, the authors are incidental,”

Different event horizons

[A] The more massive an astronomical body is the higher is its escape velocity. If it is sufficiently massive & condensed this escape velocity can equal the velocity of electromagnetic radiation. This creates a shell around the mass through which no radiation can escape or pass through. This is called the electro-magnetic event horizon.

There are ANOTHER TWO event horizons to consider. A Star Trek spaceship “event horizon” is not considered! :)

[B] Matter cannot travel at the velocity of electromagnetic radiation, so electrons, protons and their anti particles have different event horizons from the electro-magnetic event horizon.

(1) # The electron - positron event horizon # [Which is further out than the electro-magnetic event horizon.]

This is where the escape velocity or gravity gradient equals the velocity needed to split apart an electron and positron pair.

Virtual electron and positron pairs are created spontaneously everywhere (more so around charged particles).

(2) # The proton - anti-proton event horizon # [Which is further out than the electro-magnetic event horizon & the electron - positron event horizon.]

This is where the escape velocity or gravity gradient equals the velocity needed to split apart a proton - anti-proton pair.

Virtual proton - anti-proton pairs could be created spontaneously where sufficient virtual energy is created.

The distances between the event horizons will depend on the gravity gradient. Where this is highest, for the smallest black holes, the event horizons will be closest together.

**** Effects at the event horizons****

[A] The electro-magnetic event horizon:-

This is a shell around the mass through which no radiation can escape or pass through. This is called the electro-magnetic event horizon.

[B1] The electron - positron event horizon:-

If a electron - positron pair is approximately aligned with the black hole radius, and the gravity gradient is at the right strength, then one of the pair is captured by the black hole & the other escapes.

(a) The positron flying off into space eventually collides with an electron in normal space. Normal space loses the mass, angular momentum and charge of an electron, but the black hole gains the same values.

(b) The positron falls into the black hole & eventually collides with an "electron" in "black hole space" [Actually mass, angular momentum and charge each fall into an "averaged pool" inside the black hole.] [An electron & positron with very different K.E. lead to 2 equal photons emitted?]. The black hole loses the mass, angular momentum and charge of an electron, but normal space gains the same values.

[If Schrodinger had two cats [1] a dead black cat [2] an alive white cat and they both fell into a black hole, there is no guarantee that the white cat would emerge from a black hole alive! :)]

(c) Now a slightly more complex "theoretical" interaction to highlight the subtleties of interactions at the electron - positron event horizon.

If we look at TWO virtual pairs being created, with opposite orientations to the black hole radius & different kinetic energies.

(1) An electron & positron emerge from the electron - positron event horizon into normal space & collide.

Initially normal space gains two electron masses but the two masses cancel out on collision. The annihilation plus the total kinetic energy is converted into two photons of equal energy emitted in opposite directions. The gamma ray photons' direction of travel aligns with the averaged velocity [in relation to the x, y & z axes] of the two particles.

(2) An electron & positron emerge from the inner "surface" of the electron - positron event horizon and fall into the black hole & collide just inside the event horizon. [Before they reach the electro-magnetic event horizon] (If the black hole is bigger the probability of entering the black hole before collision decreases.)

Initially the black hole has gained two electron masses but the two masses cancel out on collision. The annihilation plus the total kinetic energy is converted into two photons of equal energy emitted in opposite directions. The gamma ray photons' direction of travel aligns with the averaged velocity [in relation to the x, y & z axes] of the two particles.

Initially, options (1) and (2) would seem to be identical, but, because of the strong gravity gradient

(i) the particles falling into the black hole would have higher kinetic energy.

(ii) [ignoring the photons that do not cross the electron - positron event horizon] comparing the photons crossing the e - p event horizon: the infalling photon should gain energy from the gravity gradient and the "emitted" photon (Hawking radiation from inside the e - p event horizon) should lose energy because of the gravity gradient. Overall photons falling into the black hole would have higher photonic energy than the "emitted" photons.

THIS MEANS THAT A BLACK HOLE GAINS ENERGY FROM INFALLING KINETIC ENERGY AND PHOTONIC ENERGY and, hence, must gain mass with time. Smaller black holes would have greater gravity gradients and, so, would, relatively, gain mass quicker from virtual particles. They would also have [per unit area] of the following falling towards the black hole:-

[1] more mass generated from virtual particles & hence

[2] more kinetic energy from the particles.

[3] more photonic energy from the photons.

This should mean that "natural" inflow for a black hole would be

[1] Standard galactic matter [Predominantly mass transfer from normal space to the black hole]

[2] Virtual particles [Little net mass transfer from normal space to the black hole, but a lot of kinetic energy & photonic energy transfer.] For the smallest black holes it could be possible that the mass & energy infalling from the electron - proton event horizon might have enough energy to change the mass [& energy] spread as a skin OVER [i.e. just outside] the electro-magnetic event horizon, from a low entropy, "flat sheet", [the sheets may even be "stacked up" with the higher atomic weight atoms at the bottom!] to a 3-D volume plasma [maybe even a quark plasma or pure radiation!]. [The radiation would be very red-shifted.] This would be evaporating mass from [just outside] the electro-magnetic event horizon.

The original mass of the black hole does not reduce! [Unless bombarded with antimatter!]

This plasma / radiation from [just outside] the electro-magnetic event horizon could be called "secondary Hawking radiation".

ALL BLACK HOLE CREATION RESEARCH ON EARTH SHOULD BE BANNED FOREVER!!! (THE EARTH WILL BE "CONSUMED" BY ANY CREATED!!)

Properties in & around black holes

The electron - positron event horizon & the proton - anti-proton event horizon would be “transparent” to electromagnetic radiation.

This could allow radiation to study the electron - positron event horizon & the proton - anti-proton event horizon.

Lower energy wavelengths could be bent more on passing near to a black hole. This could lead to a “redder” ring around a black hole.

Wavelength interference could help in studying the outer event horizons.

Wavelengths “skimming” off the “edge” (not necessarily at an event horizon) should be polarised.

All the astronomical black holes will be spinning. The high gravity will cause warping of space by gravity close to the black hole. These two effects will cause polarisation of the wavelengths “skimming” off the “edge”. As these wavelengths bend around, towards the “viewing axis” of the black hole, they will move from the “warping of space by gravity space” back to normal space. This will then cause reversal of the polarisation of the wavelengths.

The disturbances of the space-time background by the very early mega-stars and black holes [both of which will be spinning, of course,] will cause polarisation [polarization] of the cosmic microwave background radiation.

The black hole is circular, and the “warping of space by mass / gravity” would also be approximately circular, but there is big differences in the centrifugal / centripetal forces of “frame dragging” at the “black hole spin axis” (“north or south pole”) compared to the “black hole equator”. This would mean that the “frame dragging sphere” would be a very flattened oblate spheroid; the ergosphere. The “frame dragging” effect is assumed to be much less than the warping of space by gravity effect. It is also assumed that the “frame dragging” effect would have much less influence than the warping of space by gravity effect as the black hole size increases and, hence the gravity gradients decrease.

Differences in the orientation of the spin axis relative to the “viewing axis” of the black hole will alter the polarisation pattern and the polarisation effect.

[1] If the spin axis is aligned along the “viewing axis” the polarisation pattern will be a circular pattern gradually changing on moving along the axis. There will be polarisation of the wavelengths “skimming” off the “edge”. As these wavelengths bend around, towards the “viewing axis” of the black hole, they will move from the “warping of space by gravity space” back to normal space. This will then cause reversal of the polarisation of the wavelengths. Any radial pattern will be the same as any other radial pattern.

These two options will only apply if there is an ergosphere (or “outer ergosphere” {just outside the ergosphere}) effect.

[2] If the spin axis is aligned at right angles to the “viewing axis” the polarisation pattern will be a “linear pattern” gradually changing across the “face of the black hole”. The lines will be aligned with the “black hole spin axis”.

[3] The polarisation pattern and the polarisation effect of the intermediate spin angles are more complex. There will be ellipses at different tilts, like galaxies. The “equatorial regions” will have high polarisations, whilst there will be little at the “poles”.

This will cause polarisation of the wavelengths “skimming” off the “edge”. As these wavelengths bend around, towards the “viewing axis” of the black hole, they will move from the “frame dragged space” back to normal space. This will then cause reversal of the polarisation of the wavelengths.

Early Universe

In the early evolution of the universe, there was a period before the generation of the background cosmic microwave radiation, where the universe was opaque to electromagnetic radiation, because of radiation scattering. Most electromagnetic signals from this era and before would be wiped out. If gravitational waves had a similar nature to electromagnetic radiation the gravitational waves signals from the past too could be wiped out.

If gravitational waves are of a very different nature to electromagnetic radiation they could survive.

Neutral mass, its motions & its distortions of space-time would be almost undisturbed when the universe was opaque to electromagnetic radiation, but the charged particles in the plasma would be “kept on the rails” of electrical & magnetic force lines.

When the universe ended its (last) inflation period any matter would leave a “space-time gravity distortion imprint” in the general background. Almost all the matter would be in the plasma form at the end of inflation and easily moved by other plasma particles, magnetic & electrical fields. The first stars could have been mega-giants because of the uniformity of the universe. The sizes could have been mega solar masses which, on burning out, maybe within 1000 years, turned into the enormous black holes at the centre of most galaxies. The super-supernova would have a significant effect of clearing a lot of dust and gas away from the centre of galaxies.

The recent polarisations and large scale structures of the cosmic microwave background radiation could be from:-

[1] Any matter that has left a “space-time gravity distortion imprint” on the end of inflation.

[2] The first stars could have been mega-giants because of the uniformity of the universe.

[3] The enormous black holes from the mega-giants stars.

[4] Gravity waves. [I think we should have found them, if they existed.] [Is there a pattern of radiation shining through a (slightly distorted with large masses moving in the universe & time.) 3 dimensional array of spheres. [Maybe a few hundred “early atoms” “caught up” in the “inflation bubble”.]

The first two reference items [a] & [b] are of some relevance to the overall information here, but, generally they are “all to Geek to me”!

If you haven't seen them before they may be of interest; they may even be understandable!

[a] Particle Creation by Black Holes

[by] S. W. Hawking [1975] [pdf 22 pp]

http://www.itp.uni-hannover.de/~giulini/papers/BlackHoleSeminar/Hawking_CMP_1975.pdf

Quote:-

(pdf page 3 = “book page” 201: last paragraph)

“For a black hole of solar mass (10^{30} kg) black holes of this size would be absorbing radiation faster than they emitted it and would be increasing in mass.”

“negative energy particle”

[not found in physics? Suggests negative mass and or negative kelvin temperature.]

(pdf page 4 = “book page” 202: last paragraph)

“These small black holes, being at a higher temperature, would radiate more than they absorb. They would therefore presumably decrease in mass. As they got smaller, they would get hotter and so would radiate faster”

(pdf page 4 = “book page” 202: 14 lines up from bottom of page)

“It should be emphasized that these pictures of the mechanism responsible for the thermal emission and area decrease are heuristic only and should not be taken too literally”

[b] Black Holes, Information and the String Theory Revolution

The Holographic Universe

[by] Leonard Suskind and James Lindsay [2005] [pdf 197 pp]

http://staff.ustc.edu.cn/~wzhao7/c_index_files/main.files/blackhole.pdf

(pdf page = book page 48 - Sect 4.1 Black Hole Evaporation)

[c] Sphere Geometry of Forces & Fundamental Particles of the Universe

by S.C. Gaudie

<http://vixra.org/abs/1311.0196>

[d] Effects of Negative Inertia Mass

[as a possibility, like S. Hawking's “negative energy particle” leading to black hole evaporation.]

[on galactic rotation & localised expansion of the universe]

by S.C. Gaudie [As yet unpublished work]