International Journal of Scientific Advances
ISSN: 2708-7972
Volume: 6 | Issue: 1 | Jan – Feb 2025 Available Online: www.ijscia.com
DOI: 10.51542/ijscia.v6i1.32

Temporal Black Holes or The Black Hole Grandfather Paradox, and Serous Doubts of Special Relativity

Anthony Maccini

Flat 9, Fairhall Court, 114-124 Kingcharles Road, Surbiton, KT5 8QL, England

*Corresponding author details: Anthony Maccini; anthonymaccini@hotmail.com

ABSTRACT
Theoretically, its predicted that anything traveling at superluminal speeds arrives before it sets off, that it goes into its past. The fact that light can't escape a black hole suggests that matter falling into a black hole, would reach superluminal speeds and return before it set off. From this one suggests that the whole black hole structure would be a temporal object propagating into its past. One finds this leads to causal paradoxes. One suggests, is there any evidence of this? Of black holes swallowing their parent star in the past. One considers 3 candidates, 1. Transient or disappearing stars, 2. Failed supernovae, and 3. Gamma-ray bursts. One considers quasar jets at superluminal speeds, suggesting that black holes are temporal objects because quasars are black holes. Then lastly one considers experiments, of superluminal phenomena and in one experiment where a radio signal was received before it was sent. This suggests that all this mounting evidence gives one serious doubts about Einstein's special relativity.

Keywords: superluminal; temporal black holes; quasar jets; plasma antennas; Tolmans paradox.

INTRODUCTION
One starts on the assumption, that light can't escape from a black hole, implying that material falling into a black hole, must fall into it at superluminal speeds, and it is theoretically regarded that anything traveling at superluminal speeds would go into its own past. That material falling into a black hole would appear before it fell in, would go into its own past before it fell in, where the effect would arise before its cause.

One calls such black holes temporal black holes, and if we saw one, we would be seeing that black hole from its own future in our present. Because the whole structure of the black hole itself should propagate into its own past. But this assumption leads to causal paradoxes, of the grandfather paradox, because the black hole should propagate back in time and appear inside its parent star before its parent star became a black hole and therefore that parent star should disappear.

Is there any evidence for this? One would look for stars that suddenly disappear. But the paradox is how could the parent star become a black hole in the first place if its future black hole goes back in time and destroys that parent star? Hence the causal paradox of the grandfather paradox of temporal black holes, is the same as someone going back in time and killing their grandfather before they were born, hence the paradox.

So, then I consider what candidates for disappearing stars, is there any evidence of temporal black holes. I look at 1. Transient stars, stars that disappear, 2. Failed supernovae, that become black holes, and 3. Gamma-ray bursts that become black holes. I conclude that transient stars appear in groups of different stars, that disappear from later photographs, but rule them out as a candidate because one would not expect to see black holes in groups. One rules out failed supernovae because they are red giant stars that just disappear to become black holes. After all, red giant stars have come to the end of their life, but one still cannot totally rule them out? One chooses gamma-ray bursts as a likely candidate for temporal black holes, explosions releasing huge amounts of energy in a short moment, more than the whole galaxy, and forming black holes, because when the black hole appears in the past inside the parent star and destroys it, may lead to a huge explosion? Of course, I am not 100% that this is right? But here one encounters the problem of why some temporal black holes only appear as gamma-ray bursts and not all black holes. One argues that perhaps the different masses of black holes would go back into the past to different degrees.

Next one considers the superluminal jets of quasar black holes. That is because the jets are faster than light, where the superluminal spin of the black hole transfers its momentum to the jets, and accelerates the jets to speeds faster than light, lending support for one’s hypothesis of temporal black holes. I make arguments against what most scientists argue that superluminal jets are an illusion, by arguing that the light from quasar jets takes place at the speed of light, but that the jets themselves are superluminal.

Then I present a paper by Steffen Kuhn, where they measure in an experiment a radio signal from the rest frame of a receiver, with transverse plasma antennas, with the effect that they receive their signal from a broadcast station before it was sent, that they did this many times with the same result, that the broadcast radio waves are superluminal. Therefore, the light from quasar jets is also superluminal. This leads one to have serious doubts about special relativity, and then one presents different examples of experiments that have proved superluminal phenomena and information that has been transmitted faster than light. Experiments by Walker [11][12], by Geovge M. Gehring [2], experiments by Steffen Kuhn [9], Takaaki Musha [12], with a list of many other experiments detecting light as superluminal and Darko Bajlo [19][20] in detecting advanced waves. All the evidence has mounted up causing one to have serious doubts of Einstein's special relativity.

SUPERLUMINAL MOTION OR CAUSAL PARADOXES OF FASTER-THAN-LIGHT MOTION APPLIED TO BLACK HOLES

A friend had suggested to me, (which led me to write this whole paper) that because light can't escape a black hole, the speed at which material falls into a black hole would be faster than the speed of light. It is generally known that anything with superluminal speed would also be going backward in time to a point before it started to fall into the black hole. As in the famous saying: 'There once was a woman called bright, who could travel faster than light, she went off one day in a relative way and came back the previous night'.

Surely then material falling into a black hole would propagate back in time before it left. One would expect to see material appearing outside a black hole, which would be evidence of a causal paradox. There is a paper[1], 'How superluminal motion can lead to backward time travel', by Robert J. Nemiroff and David M. Russell, they say in their abstract: 'It is commonly asserted that superluminal particle motion can enable backward time travel, but little has been written providing details. It is shown here that the simplest example of a ''closed-loop'' event - a twin paradox scenario where a single spaceship both travels out and returns superluminally- does not result in that ship straightforwardly returning to its starting point before it leaves. However, a more complicated scenario- one where the superluminal ship first arrives at an intermediate destination moving subluminally- can result in backward time travel. This intermediate step might seem physically inconsequential but is shown to break Lorentz-invariance and be oddly tied to the sudden creation of a pair of spacecraft, one of which remains and one of which annihilates with the original spacecraft'.

They say in their paper, that there appears to be no detailed treatment, showing how superluminal speeds leads to 'closed-loop' backward time travel: a material observer returning to a previously occupied location at an earlier time.

This also applies to material falling into a black hole at superluminal speeds. One can apply this to a black hole, of a spacecraft falling into a black hole at superluminal speed, would go backward in time, and return to a point before it fell into the black hole. The spacecraft would appear before its point of falling into the black hole. To create a paradox, the spacecraft returning to its point of departure in the past, before it fell into the black hole, the Astronaut on board the spacecraft could take action and avoid falling into the black hole, thereby creating a paradox.

Robert J. Nemiroff argues in their paper [1], that a ship on the launch pad about to take off and travel at superluminal speed towards a star, would return to Earth and land on a launch pad before it set off, and could create a paradox, by preventing the first spacecraft from taking off. He says also, observers on Earth would see images of the traveling spacecraft toward the star and returning images of the spacecraft come together and disappear. Such behavior is not fiction but has been observed with light pulses entering an optical cable [2], Robert W. Boyed, in a paper, 'Observation of backward pulse propagation through a medium with a negative group velocity'. They send a light pulse through an optical fibre and the pulse exits the fibre before it enters it. 1, as the initial pulse of light approaches the glass, a new pulse forms at the far end. 2, the new pulse splits in two, one traveling backward in the glass, the other exiting. 3, the backward pulse meets and cancels out the initial pulse. 4, only the final pulse remains. Although Robert Boyed who experimented, tries to explain it away as an illusion of being faster than light. It does appear to be identical behavior described theoretically by Robert J. Nemiroff and David M. Russel in their paper [1]. 'How superluminal motion can lead to backward time travel', as was talked of previously. It also seems to be what happens in the equations of Tolmans paradox for faster-than-light signals, where effect happens before cause, but I came back to this later. Therefore, it appears one getting causal violations from a superluminal light pulse in an optical cable, leaving it, before it enters it.

In a paper [3], by G. L. Harnagel, 'Superluminal motion and causality from a laboratory perspective'. Give an equation of the effect of superluminal motion. Given an inertial frame moving at velocity v with respect to a ''stationary'' frame, the time differential in the moving frame over a distance Δx in the stationary frame is:

$$\Delta t' = y\left(\Delta t - \frac{v\Delta x}{c^2}\right)$$

Where Δt refers to the time differential in the ''stationary'' frame, c is the speed of light and $y = 1/\sqrt{1 - v^2/c^2}$. Einstein concluded that for Δt less than $v\Delta x$, $\Delta t'$ would be negative, implying that any such speeding object would arrive at its destination before it departed from its origination point, according to a moving observer. Similarly, Richard Tolman pointed out in 1917 that velocities greater than the speed of light presented the possibility that effect could precede cause.

This is shown in a set of equations by him, called Tolmans paradox: For sending a signal faster than light, we have the following expressions of Tolmans paradox. Einstein's 1907 thought experiment of how faster-than-light signals lead to paradoxes of causality. For sending a signal faster than light $\Delta t = t - t^{\circ} = \frac{B-A}{a}$ The arrival at B is given by velocity a, and event A is the cause of B. This inertial frame moving with relative velocity v, the time of arrival at B is given according to the Lorentz transformation:

$$\Delta t' = t' - t^{\circ} = \frac{t^{\circ} - vB/c^2}{\sqrt{1 - v^2/c^2}} - \frac{t^{\circ} - vA/c^2}{\sqrt{1 - v^2/c^2}}$$

$$= \Delta t' = \frac{1 - av^2/c^2}{\sqrt{1 - v^2/c^2}} \Delta t$$

If $a > c$ then certain values of v, can make $\Delta t'$, negative, in other words, the effect arises before the cause in this frame.

Also, the Tolmans paradox should apply to black holes, and the black holes we detect should be detecting them from the future because there propagating into the past. One can apply the Tolmans paradox to energy, but the energy would be negative:

$$-\Delta E' = \frac{1 - av^2/c^2}{\sqrt{1 - v^2/c^2}} \Delta E$$

The energy propagates faster than light, falling into a black hole, whose effect would be before its cause. One could write the same expression for mass. The mass would be negative and it would appear before it fell into the black hole, in its own past:

$$-\Delta m' = \frac{1 - av^2/c^2}{\sqrt{1 - v^2/c^2}} \Delta m$$

In the April 1974 issue of Physical Review, Frank Tipler suggested that if an infinite cylinder had a sufficiently powerful gravitational field and a sufficiently fast rotation, it would drag spacetime around it in the direction of its rotation. The light cones of an observer dragged around this cylinder would tilt so that the observer could travel into the past. That this would be a time machine.

The fact is black holes are infinitely dense objects and they have spin. An observer in orbit of a rotating black hole would have their light cones tilted to the horizontal. So, the observer could travel into the past.

TEMPORAL BLACK HOLES OR THE GRANDFATHER PARADOX OF BLACK HOLES

The black holes we detect should be from the future? If as Kip Thorne says, black holes are not made of anything physical, but are made totally of curved spacetime and gravity, that there is not a physical structure, it occurred to me that the whole structure of black holes must propagate into their own past. Because even light can't escape, as material falls into it at superluminal speeds that go backward in time, the whole structure of the black hole must propagate into its own past.

The black hole should go backward in time and appear inside its former star before it becomes a black hole and destroy its former star, then how did its former star become a black hole, if its future black hole formed inside the star and destroyed it. This is identical to the grandfather paradox. Such temporal black holes lead to causal paradoxes. Is there any observational evidence of this? One would expect if this were true, for stars to suddenly disappear. Looking for observations of temporal black holes, there are 3 candidates I will look for:

1. Transient stars, stars that disappear
2. Failed supernovae
3. Gamma-ray bursts

1. TRANSIENT STARS, STARS THAT DISAPPEAR

One is considering here, of transient stars or disappearing stars as possible candidates for temporal black holes. If the whole spacetime structure of black holes really does propagate into their own past and appear inside its former star and destroy it, one would expect to observe such stars disappear. In a paper [4] by Beatriz Villarroe, 'Exploring nine simultaneously occurring transients on April 12th, 1950'. They say in their abstract: 'Nine-point sources appeared within half an hour on a region within~10 arcmin of a red-sensitive photographic plate taken in April 1950 as part of the historic Palomar sky Survey. All nine sources are absent on both previous and later photographic images, and absent in modern surveys with CCD detectors which go several magnitudes deeper. We present deep CCD images with the 10.4-m Gran Telescopio Canarias, reaching brightness r'mag, that reveal possible optical counterparts, although these counterparts could equally well be just chance projections. The incidence of transients in the investigated photographic plate is far higher than expected from known detection rates of microlensing events. One possible explanation is that the plates have been subjected to an unknown type of contamination producing main point sources with of varying intensities along with some mechanism of concentration within a radius of~10 arcmin on the plate. If contamination as an explanation can be fully excluded, another possibility is fast (t<0.5s) solar reflections from objects near geosynchronous orbits. An alternative route to confirm the latter scenario is by looking for images from the first Palomar Sky Survey where multiple transients follow a line'.

They concluded that every possible explanation is ruled out, and they cannot explain the phenomena. They went over every possibility that these objects have a normal explanation, but they ruled all this out. In one of their images in their paper, they show two photos, one showing 8 stars, and in the next photo taken of the same area many years later, all 8 stars have disappeared. In another set of two photos they show the first two stars, the photo next to it, of the same area of sky, the two stars have disappeared. There is another set of two photos showing 3 stars disappeared.

At first one could consider such transient disappearing stars as possible candidates of temporal black holes?

But it may not be convincing because the likelihood of black holes all appearing in groups of 8 in photos, that is of the disappearing stars becoming black holes, does not seem what one would expect. So, I don't think transient or disappearing stars are a likely candidate for temporal black holes.

2. FAILED SUPERNOVAE

The 2nd candidate for temporal black holes is failed supernovae, where red supergiant stars do not go supernovae, but just disappear, forming black holes. In a paper [5] by S. M. Adams, C. S. Kochanek, J. R. Gerke, K. Z. Stanek, and Dai, they say in their abstract: 'We present Hubble Space Telescope imaging confirming the optical disappearance of the failed supernovae (SN) candidate identified by Gerke et al. (2015). This $\sim 25\ M_{\odot}$ red supergiant experienced a weak $\sim 10^6\ L_{\odot}$ Optical outburst in 2009 and is now at least 5 magnitudes fainter than the progenitor in the optical. The mid-IR flux has slowly decreased to the lowest levels since the first measurements in 2004. There is faint (2000-3000 $L_{\odot}$) near-IR emission likely associated with the source. We find the late-time evolution of the source to be inconsistent with obscuration from an ejected, dusty shell. Models of the spectral energy distribution indicate that the remaining bolometric luminosity is >6 times fainter than that of the progenitor and is decreasing as $\sim t^{-4/3}$. We conclude that the transient is unlikely to be an SN impostor or stellar merger. The event is consistent with the ejection of the envelope of the red supergiant in a failed SN and that late-time emission could be powered by fallback accretion onto a newly-formed black hole. Future IR and X-ray observations are needed to confirm this interpretation of the fate of the star.'

They further say in their introduction: 'Supernova (SN) surveys for the deaths of massive stars search for a sudden brightening of a source. However, it is expected that some fraction of massive stars experiences a failed SN, forming a black hole without a luminous SN. While this idea is most widely accepted for very high mass stars at lower metallicity, evidence has recently emerged suggesting that failed SN may also occur in red supergiants (RSGs) with solar metallicity.'

This looks like a candidate for a temporal black hole, appearing from the future, inside its parent star, and the star disappearing. The drawback here is the black hole formed late supergiant phase, and the temporal black hole forming inside the star of a supergiant, may not be a convincing candidate for a temporal black hole? Because one would expect a young star to disappear, not at the red giant stage of the star. But one can’t rule out that such supergiant stars, disappearing and becoming black holes could still be candidates for temporal black holes.

3. GAMMA-RAY BURSTS

The 3rd candidate for temporal black holes is Gamma-ray bursts. Gamma-ray bursts are bursts of intense cosmic ray energy from outside our galaxy, with an energy $> 10^{52}$ erg, more powerful than all the energy of our galaxy in a short moment.

After the burst dies down it is assumed that black holes are formed. One's hypothesis here for temporal black holes is that the black hole propagates into its own past, and appears inside its parent star from the future, which (in regard to Gamma-ray bursts) leads to a powerful explosion as Gamma-ray burst. This seems a good candidate?

In a paper [6] 'Identifying black hole central engines in Gamma-ray burst', by Vidushi Sharma, Shabnam Iyyani, and Dipankar Bhattacharya, they say in their abstract: 'The nature of the gamma-ray burst (GRB) central engine still remains an enigma. Entities widely believed to be capable of powering the extreme jets are magnetars and black holes. The maximum rotational energy that is available in a millisecond magnetar to form a jet is $\sim 10^{52}$ erg. We identify eight long GEBs whose jet-opening angle-corrected energetics of the prompt emission episode are $> 10^{52}$ erg with high confidence levels and, therefore, their central engines are expected to be black holes. The majority of these GRBs present significant emissions in the sub-GeV energy range. The X-ray afterglow light curves of these bursts do not show any shallow decay behavior such as a plateau: however, a few cases exhibit flares and multiple breaks instead of a single power-law decay. For a minimum mass of the black hole ($\sim 2\ M_{\odot}$), we find the efficiency of producing a jet from its rotational energy to range between 2% and 270%. Highly energetic jets requiring high efficiencies imply that either the mass of these black holes is much larger or there are, in addition, other sources of energy that power the jet. By considering the Blandford-Znajek mechanism of jet formation, we estimate the masses of these black holes to range between ~2 and $60 M_{\odot}$. Some of the lighter black holes formed in these catastrophic events are likely candidates to lie in the mass-gap region (2-5$M_{\odot}$).'

GRB outflows are collimated relativistic jets, which means that the exact burst of energy (3×10^{52} erg) is the amount of energy that is ejected into the solid angle forming the jet. Such jets may be superluminal. The total burst energies of these GRBs are even greater than this limit ($> 10^{52}$ erg) and thereby confirm that the central engine or remnant of the core collapse of the massive progenitar star of these GRBs are black holes.

This paper [6] on GEB could support my hypothesis of temporal black holes, and therefore causal paradoxes might be observed in nature? My friend explained that the faster an object moves faster than light, and there may be degrees of how far temporal black holes propagate into the past. Would this agree with observational evidence of GRBs and the discrepancy with the observation, that not all black holes formed from GRBs, and the logic that all temporal black holes should propagate into their own past, and how far they do propagate into the past? If there is any evidence, it would be evidence of causal paradoxes, but as it stands this is just a hypothesis?

To make sense of the causal paradox of temporal black holes, one has to argue that the star's original timeline where the star becomes a black hole, but gives birth to a temporal black hole, that goes into the past, creating a new timeline, where it destroys its former star in the past before it could become a black hole. Both timelines exist or had existed and the past is changed. Here I dismiss the many worlds interpretation, the new timeline does not split off into an alternative world, so that causality and the past are preserved, the past is changed in our universe, not in any alternative world. So, the black hole appeared in the past before it became a black hole. Hence the name temporal black hole, hence the causal paradox and the notion of the grandfather paradox of black holes.

This is identical to the grandfather paradox of a time traveler, going into the past to kill his grandfather before the time traveler was born. But this concept is identical to what happens to temporal black holes, going into the past and destroying their former star, thereby creating a causal paradox.

But if such temporal black holes actually exist, it implies that one really could go back in time, and kill one's grandfather before one was born, creating a paradox. And the way to understand it is to argue that both timelines exist. The timeline when the time traveler is born and the timeline when the time traveler goes back in time and kills his grandfather, so he is never born. If he does exist, when he goes back to his own time, things will have changed, because he changed the past, and he would be someone who has never been born, this is illustrated in the film, 'Its a Wonderful Life', where the Angle shows James Stewart, what the world looks like if he had never been born.

As I was saying both timelines exist, it's simply that he changes the past and changes the first timeline, to a timeline where he was never born! The message is simple, if temporal black holes actually exist, the fact that they go into the past and destroy their parent star implies that all kinds of time paradoxes are really possible in nature and that nature allows such possibilities, where one really could change the past. Many scientists will not be happy with this, for them it's a can of worms, that they will try to dismiss, but if it's true that temporal black holes exist, therein for a shock, because of its implications.

BLACK HOLE QUASARS

Black holes are not physical objects, their structure is made of gravity and of spacetime, a hole in space and time, that also has spin. Black holes rotate, but what is rotating if there are no physical objects. But they do rotate, this does seem paradoxical, it must be spacetime itself that rotates. Regarding quasars with jets, that appear to shoot out of the quasar black holes, must transfer their angler momentum to their jets, resulting in the cause of superluminal jets. In the book [7] by J. Anton Zensus and Timothy J. Person, 'Superluminal radio sources', more than 100 quasar have been observed with jets moving away from the quasars at superluminal speed.

And in a book [8] by Takaaki Musha, 'Tachyon Universe', on pages 30-31, he argues: 'Far away from our galaxy, several of the quasars seem to show two components flying apart at high velocity. In a few cases, the velocity appears to exceed that of light. They leave 3C345 flying apart at apparently 2.5 times the speed of light. Apparent superluminal speeds of this kind are in fact being observed. In 1973, in quasar 3C279 a luminous component was found that apparently moves away from the quasar core at ten times the speed of light. At the present time, a number of these so-called superluminal quasars is known, among them 3C273. From the observation, the jet of this quasar moves away from the quasar core at a rate of about three-quarters of a milliarcsecond per year. The redshift of the quasar indicates a distance of about 2.6 billion light years. A path at this distance that extends over three-quarters of a milliarcsecond in the sky, is more than nine light-years long. Thus, the component appears to traverse 9 lightyears in the course of a single year. This would make it nine times as fast as light. In addition, the motion that we observe is only the transverse part. There is an additional unobserved velocity component of unknown size in the direction of the line of sight. From the observation of superluminal velocities, they would destroy one of the foundations of modern physics, that is the special relativity theory.'

The prevailing view by scientists claims that this superluminal speed of jets from quasars is an illusion, from the textbook, 'Universe', 7th edition by Roger A. Freedman and William J. Kaufmann, page 619: 'Four images are shown, high-resolution radio maps of the quasar 3C273. They show a blob that seems to move away from the quasar at 10 times the speed of light. In fact, a beam of relativistic particles from 3C273 is aimed almost directly at the Earth, giving the illusion of faster-than-light motion.

They say further: 'Explanation of superluminal motion If a blob of material ejected from a quasar moves at five-sixths of the speed of light, it covers the 5 Ly from point A to point B in six years. It moves 4 Ly toward the Earth and 3 Ly in a transverse direction. The light emitted by the blob at A reached us in 2010. the light emitted by the blob at B reached us in 2012. The light left the blob at B 6 years later than the light from A but had 4 fewer light-years to travel to reach us. From Earth, we can see only the blob's transverse motion across the sky. It appears that the blob has traveled 3 Ly in just 2 years, so its apparent speed is 3/2 of the speed of light, or 1.5c.'
My argument against this view is that superluminal jets from quasars are really superluminal. But that the light emitted from the jets only at the speed of light. But it is the material of the jets themselves that are superluminal, creating the illusion that the jets are under the speed of light because the light emitted from the jets is at the speed of light. Because the jets are superluminal, they must propagate into the past, so we are seeing them from the future in our present.

There is a paper [9] by Steffen Kuhn, 'Experimental detection of superluminal far-field radio waves with transverse plasma antennas'. Which proves that electromagnetic waves (light) are in fact faster than light, where they received a radio broadcast before it was sent, and therefore would prove that quasar jets are superluminal, that the light we get from the jets is also faster than light. This is a violation of special relativity. They say in their abstract: The predictions of Maxwell's equations depend on the reference frame in which they are solved. If one solves Maxwell's equations in the rest frame of the transmitter, which is the common approach, one obtains Lorentz-Einstein electrodynamics by adding the special theory of relativity. Here, for formal reasons no information velocities greater than the speed of light in vacuum are possible. If, however, one solves Maxwell's equations rigorously in the rest frame of the receiver, one comes to a field-theoretical generalization of Weber electrodynamics, which differs from Lorentz-Einstein electrodynamics. Although Einstein's postulates are also fulfilled in this Weber-Maxwell electrodynamics, in a specifically designed experimental setup of two mutually stationary and very distant antennas, electromagnetic waves may travel at velocities that exceed the speed of light in a vacuum. This effect, previously predicted only theoretically, has now been experimentally investigated and confirmed. This finding indicates that Lorentz-Einstein electrodynamics is incorrect and that Maxwell's equations should be interpreted in terms of Weber electrodynamics. As a subsidiary result, these findings can enable remarkable new technologies, such as a highly compact method for radio direction finding.

From what has been said of this experiment, is a violation of special relativity, one argument that the jets from quasars are superluminal, but that we can see that the light they emit is at the speed of light, must now be revised, from the experiment mentioned above, has proven that radio waves, electromagnetic waves, (light) is faster than light. So, the radiation emitted from the quasar jets must be faster than light, as well as the jets being also faster than light, one now has serious doubts about special relativity.

Now I am going to give examples of superluminal phenomena in experiments. In a paper [10] by G. A. Benford, D. L. Book, and W. A. Newcomb, 'The Tachyonic Antitelephone'. They say in their abstract: The problem of detecting faster-than-light particles is reconsidered in relation to Tolman's paradox. It is shown that some of the experiments already underway or contemplated must yield negative results or give rise to causal contradictions.

On page 263, they say: In 1917 Tolman presented an argument (Tolman's paradox) showing that faster-than-light signals can be propagated, then communication with the past is possible. Here is the Tolmans equation showing this:

For sending a signal faster than light:

$$\Delta t = t - t^{\circ} = \frac{B - A}{a}$$

The arrival at B is given by velocity a, and event A is the cause of B. This inertial frame moving with relative velocity v, the time of arrival at B is given according to the Lorentz transformation:

$$\Delta t' = t' - t^{\circ} = \frac{t^{\circ} - vB/c^2}{\sqrt{1 - v^2/c^2}} - \frac{t^{\circ} - vA/c^2}{\sqrt{1 - v^2/c^2}}$$

$$= \Delta t' = \frac{1 - av^2/c^2}{\sqrt{1 - v^2/c^2}} \Delta t$$

If $a > c$ then certain values of v, can make $\Delta t'$ negative, in other words, the effect arises before the cause in this frame.

Now I will look for experimental evidence as proof of Tolman's paradox. First from paper [9] by Steffen Kuhn, 'Experimental detection of superluminal far-field radio waves with transverse plasma antennas'. On page 3 they say: Transverse plasma antennas have a property that ordinary antennas do not possess. This property becomes clear when one analyzes the situation. Here a radio tower (A) at location x=0 emits a Z-polarized electromagnetic wave in the x-direction. This wave then meets a transverse plasma antenna (B) at location x=r, which is aligned to the x-axis, corresponding to the direction of wave propagation.

In the transverse plasma antenna, electrons rapidly move along or against the direction of the x-axis depending on the sign of the applied DC voltage. According to the principle of relativity, an approximately uniformly moving electron in the antenna may consider itself to be at rest and instead assume that the radio tower is moving.

This result is indeed required because Einstein's second postulate states, that the wave must move concerning the receiver at exactly the speed of light c. However, because the electron itself has a velocity v, the waves must propagate correspondingly faster. Thus, it can be concluded that one should be able to receive the transmitted signal earlier with a transverse plasma antenna, than with an ordinary antenna. This result is in gross contradiction to our expectations based on special relativity because both the transmitter and transverse plasma antenna are at rest. Superluminal signal transmission especially between antennas at rest concerning each other, should not be possible.

Nevertheless, this result is achieved by solving Maxwell's equations without additional ad hoc assumptions in the receiver's rest frame. In other words, when applied in their pure form, Maxwell's equations lead exactly to this result.

So, they experimented, and their experiment is controversial, that light waves or electromagnetic waves are faster than light! From reading this whole paper I have serious doubts about Einstein's special relativity! If special relativity is correct, there should be no significant measurable time shift between the signals as a function of the cardinal direction. However, if Weber-Maxwell electrodynamics is correct, it should be possible to determine the direction of the radio tower by rotating the antenna module. During the experiment, it quickly became clear that the latter was true.

As can be seen, the transverse plasma antenna received the signal approximately 40ns earlier when the electrons in the tube were moving away from the transmitter (70°) and approximately 40ns later when the antenna was rotated (250°).

The conclusions of this paper, they say: This article has demonstrated, both experimentally and by interpretation of the solutions of Maxwell's equations for a moving Hertian dipole, that it is possible to construct receiving antennas in such a way that electromagnetic waves in the far field are received earlier than should be possible due to the upper-speed limit of *c*.

It's made clear that these antennas and experimental results do not contradict Maxwell's equations and Einstein's postulates. However, the results are in contradiction to special relativity. As explained in this paper, the basic hypothesis of this mechanism is based on the assumption that matter can perceive only that part of the electromagnetic field that is sufficiently slow in the corresponding rest frame. In turn, this assumption implies that the Earth is continuously penetrated by electromagnetic waves moving faster than *c* with respect to our planet. This may sound implausible, but it is the only logical explanation.

So, I am having serious doubts about the special theory of relativity, with light and radio waves faster than light. In 1905, Albert Einstein provided a philosophical-mathematical interpretation with the special theory of relativity. This interpretation, as well as its accompanying mathematical formalism, is accepted today by the majority of physicists as a necessary evil and is ignored by almost all electrical engineers as irrelevant to their field.

If light or electromagnetic radiation from distant stars is faster than light according to the results of this experiment, then we are not looking necessarily into the past, for the light taking so long to reach us, but partly seeing these objects from their future, because the electromagnetic radiation they emit is superluminal, and the same with quasars having superluminal jets, will be seen from it's future, in our present, along with the stars. The conclusion I came to, from these experiments, no matter how difficult to accept, is the only logical conclusion in the paper by Steffen Kuhn [9], they say in their conclusion, as a first test, one could attempt to receive a signal of the space probe Voyager 1, some minutes earlier than is currently possible.

Is not this that has been said above fitting Tolmans paradoxes and a violation of special relativity. Is the information then sent into the past? Regard A as the transmitting station, and B as the receiver. B receives the signal before A sends it, therefore when

A sends it, and B has already received it in the future. I now want to give more evidence of information being sent faster than light. In an experiment by William D. Walker [11] 'Superluminal electromagnetic and gravitational fields generated in the nearfield of dipole sources'. He says in his Abstract: In this paper, the fields generated by an electric dipole and gravitational quadrupole are shown to propagate superluminally in the nearfield of the source and reduce to the speed of light as the fields propagate into the farfield. A theoretical derivation of the generated fields using Maxwell's equations is presented, followed by a theoretical analysis of the phase and group speed of the propagating fields. This theoretical prediction is then verified by a numerical simulation which demonstrates the superluminal propagation of modulated signals in the nearfield of their sources.

An experiment using simple dipole antennas is also presented which verifies the theoretically expected superluminal propagation of transverse electromagnetic fields in the near field of the source. The phase speed, group speed, and information speed of these systems are compared and shown to differ. Provided the noise of a signal is small and the modulation method is known, it is shown that the information speed can be approximately the same as the superluminal group speed. According to relativity theory, it is known that between moving reference frames, superluminal signals can propagate backward in time enabling violations of causality. Several explanations are presented which may resolve this dilemma.

Also, Walker says on pages 32-33: Some physics accept that phase velocity and group velocity in these systems can be superluminal, but that the information speed is less than the speed of light. It has been shown in this paper that although group speed can differ from information speed, provided the noise is small and the method of modulation is known, group speed can be approximately the same as the information speed. It is also commonly stated by physicists that the front speed (speed of a field step function or impulse) is limited to the speed of light. In the above paragraph, it has been argued that an impulse changes shape as it propagates, and therefore it cannot be used to determine the speed of the field in the nearfield. The analysis in this paper has shown that in order for signals to propagate without much dispersion, the signals must be narrowband, such as provided by conventional AM, FM, and PM modulations. This is because the phase vs. frequency curve must be linear over the bandwidth of the signal. Because impulses and step functions are broadband signals, different frequency components will propagate at different speeds resulting in signal distortion.

Walker's conclusion: The analysis presented in this paper has shown that the fields generated by an electric or magnetic dipole, and also the gravitational fields generated by a quadrupole mass source, propagate superluminally in the nearfield of the source and reduce to the speed of light as they propagate into the far-field.

The group speed of the waves produced by these systems has also been shown to be superluminal in the near field. Although information speed can be less than group speed in the near field, it has been shown that if the method of modulation is known and provided the noise of the signal is small enough, the information can be extracted in a time period much smaller than the wave propagation time. This would therefore result in information speeds only slightly less than the group speed which has been shown to be superluminal in the nearfield of the source. It has also been shown that Relativity theory predicts that if an information signal can be propagated superluminally, then it can be reflected by a moving frame and arrive at the source before the information is transmitted, thereby enabling causality to be violated.

Given these results, it is at present unclear how to resolve this dilemma. Relativity theory could be incorrect or perhaps it is correct and information can be sent backwards in time. Perhaps suggested by the 'Hawking chronology protection conjecture', nature will intervene in any attempt to use the information to change the past. Therefore, information can be propagated backwards in time but it cannot be used to change the past, thereby proving causality. Another possibility is that according to the 'many-worlds' interpretation of quantum mechanics, multiple universes are created any time an event with several possible outcomes takes place. If this interpretation is correct, then information can be transmitted into the past of alternative universes, thereby preserving the past of the universe from which the signal was transmitted. So, the 3 experiments so far show, that information can be transmitted faster than light, a violation of special Relativity.

In the paper [2] by Georg M. Gehring, Aaron Schweinsberg, Christopher Bari, Natalie Kostinski, and Robert W. Boyd, as earlier mentioned at the beginning of this paper, where a light pulse leaves an optical fibre before it enters it, with a backward pulse propagating, that cancels out the initial pulse, confirms Tolman's paradox, of the light pulse leaving the optical fibre before entering it. Despite the Authors of that paper, trying to dismiss such behavior as not violating causality, (as Walker shows some of the arguments they use to dismiss such behavior) that this is evidence of violating causality, that the light pulse is superluminal and supports the experiment of [9], of radio waves being received earlier in the far field with plasma antennas. The next paper [13] by Takaaki Musha, 'Superluminal speed of photons in the electromagnetic near-field'. Here Takaaki Musha says in his abrstact: The possible existence of superluminal particles, which are forbidden by well-known laws of physics has been studied by many physicists. Some of them confirmed the superluminal speed by their experiments. By using the Klein-Gordon waves equation for photons, the author shows that the photon travels at a superluminal speed in an electromagnetic near field of the source and they reduce to the speed of light as they propagate into the far field.

He also says in his introduction: that E. Recami claimed in his paper [14] that tunneling photons traveling in evanescent mode can move with superluminal group speed inside the barrier. Chu and S. Wong at AT&T Bell Labs measured superluminal velocities for light traveling through the absorbing material [15]. Furthermore, Steinberg, Kwait, and Chiao devised an experiment measuring the tunneling time for visible light through an optical filter, consisting of a multilayer coating about m thick, and confirmed superluminal speed [16]. The results obtained by Steinberg and co-workers have shown that the photons seemed to have traveled at 1.7 times the speed of light. Recent optical experiments at Ptinceton NEC have verified that superluminal pulse propagation can occur in transparent media [17]. These results indicate that the process of tunneling in quantum physics is indeed superluminal, as claimed by E. Recami. Caligiuri and Musha also confirmed the existence of superluminal photons in brain microtubules theoretically [18].

Indeed, is this not more evidence of light being faster than light. The last paper I want to give as evidence is by Darko Bajlo [19], 'Measurement of advanced electromagnetic radiation'. Here as an experiment in 2017, Bajlo was the first person to detect advanced waves traveling into the past, where the effect arises before its cause. He says in his abstract: For the purpose of detecting advanced electromagnetic radiation predicted by Wheeler-Feynman absorber theory for the case of incomplete absorption of retarded electromagnetic radiation, pulses in duration of 6 ns to 24 ns, wavelength from 91cm to 200cm where supplied to three different transmitting antennas. Detection was done with a λ /20 monopole antenna in the advanced time window at a time 2r/c before the arrival of the centre of the retarded pulse. At distances ranging from 430cm to 18m, advanced signals were measured in the SNR $(\frac{\mu}{\sigma})$ range from 15.4 to 30.9.

Bajlo argues in another paper [20] 'The hidden arrow of electromagnetic radiation: unmasking advanced waves', where he says in his abstract: Advanced potentials are generally discarded on causal or statistical grounds, as a consequence of misinterpreting advanced waves as incoming waves. Perceiving advanced waves as incoming waves is an illusion created by an anthropocentric view of time. Seen from 'nowhen', outside a block of space-time, advanced waves are also outgoing waves, the cause and source of which is a transmitting antenna just as in the case for retareded waves. The transmitting antenna radiates advanced electromagnetic waves into free space, in line with Hoghart's calculations in the Wheeler-Feynman absorber theory for an open, ever-expanding universe. The reason advanced radiation is not observed is due to the act of the observation itself, in which lies a hidden mechanism that masks advanced waves. By introducing a receiving antenna, we introduce an absorber where its advanced waves cancel out the advanced waves of the transmitting antenna. However, advanced radiation may still be detectable if the impact of the measuring instrument on the phenomenon being measured is minimized, as recent experiments with radio waves have indicated.

Suppose Bajlo's experiment was done again, but this time to send information, we would have a situation where information is transmitted into the past, which would be another violation of Special Relativity. From all the examples I have shown of all these experiments, there is mounting evidence of violations of special Relativity, that special Relativity is wrong, and I myself have serious doubts of special Relativity, regarding the presented evidence.

CONCLUSIONS

One concludes that black holes should be temporal black holes, that their whole structure in space-time should propagate into the past because these black holes would be superluminal objects, (because light can't escape them), that they are made up of space-time, they are not physical objects. But this idea presents causal paradoxes, on the level of the grandfather paradox, of black holes.

The observed evidence of this and the 3 candidates, 1. Transient or disappearing stars, 2. failed supernovae, and 3. gamma-ray bursts are inconclusive? More observations have to be done for evidence of temporal black holes. Black holes should be superluminal, whereas Jets from quasar black holes should be evidence that black holes are temporal objects. The experimental evidence of superluminal phenomena is mounting evidence and leads to serious doubts about Einstein's special theory of Relativity.

Even though I considered 3 candidates for temporal black holes, the evidence is inconclusive? Do they exist? Black holes should be temporal objects. Perhaps special Relativity is wrong, that things going faster than light don't go into the past? But this is wrong. But this is wrong also, because of the many experiments I included in this paper, i.e. receiving information signal from a broadcast before it was sent, and light leaving an optical cable before it enters it. Information is transmitted faster than light, in the near-field of Walker's experiment and advanced waves, where the effect arises before its cause. These experiments prove anything going faster than light, does go into the past, as predicted by Tolmans paradox.

So, do temporal black holes exist? Or perhaps one could argue that depending on the different masses of black holes, there might be different degrees to how far into the past they go? Is there something wrong with the idea of temporal black holes, they should exist. Such objects lead to causal paradoxes. This is what should be searched for among observations of the black holes. I feel there is something wrong somewhere. I wonder how did I come to such crazy ideas of temporal black holes, some scientists say, that the craziest ideas are the most interesting and should be looked into. Whether the truth of temporal black holes will have to wait for future observations.

REFERENCES

[1] Nemiroff, R. J., & Russell, D. M. (2015). How superluminal motion can lead to backward time travel. arXiv:1505.07489v2 [physics.pop-ph], 8 September 2015.

[2] Gehring, G. M., Schweinsberg, A., Barsi, C., Kostinski, N., & Boyd, R. W. (2006). Observation of backward pulse propagation through a medium with a negative group velocity. Science, 312(5775), 895–897. https://doi.org/10.1126/science.1125550

[3] Harnagel, G. L. (2021). Superluminal motion and causality from a laboratory perspective. (October 5, 2021).

[4] Villarroel, B., Marcy, G. W., Geier, S., Streblyanska, A., Soland, E., Andruk, V. N., Shultz, M. E., Gupta, A. C., & Mattsson, L. (n.d.). Exploring nine simultaneously occurring transients on April 12th, 1950. Scientific Reports. Retrieved from https://www.nature.com/scientificreports

[5] Adams, S. M., Kochanek, C. S., Gerke, J. R., Stanek, K. Z., & Bai, X. (2017). The search for failed supernovae with the large binocular telescope: Confirmation of a disappearing star. arXiv:1609.01283v2 [astro-ph.SR], 14 May 2017.

[6] Sharma, V., Iyyani, S., & Bhattacharya, D. (2021). Identifying black hole central engines in Gamma-ray bursts. The Astrophysical Journal Letters, 908(1), L1. https://doi.org/10.3847/2041-8213/abd95c

[7] Zensus, J. A., & Pearson, T. J. (Eds.). (1987). Superluminal Radio Sources. Cambridge University Press.

[8] Musha, T. (2019). Tachyon Universe. Lambert Academic Publishing.

[9] Kuhn, S. (2023). Experimental detection of superluminal far-field radio waves with transverse plasma antennas. Aurinovo GmbH, 30 October 2023.

[10] Benford, G. A., Book, D. L., & Newcomb, W. A. (1970). The Tachyonic antitelephone. Physical Review D, 2(2), 263–265. https://doi.org/10.1103/PhysRevD.2.263

[11] Walker, W. D. (2006). Superluminal electromagnetic and gravitational fields generated in the near-field of dipole sources. Norwegian University of Science and Technology (NTNU). https://arxiv.org/abs/physics/0603240

[12] Markoulakis, E. N., Walker, W. D., & Antonidakis, E. (n.d.). Superluminal Maxwell displacement current measured in the near-field of a spherical capacitor.

[13] Musha, T. (2019). Superluminal speed of photons in the electromagnetic near-field. Recent Advances in Photonics and Optics, 2(1), 36–39, 26 June 2019.

[14] Recami, E. (2001). A bird's-eye view of the experimental status-of-the-art for superluminal motions. Foundations of Physics, 32(7), 1119–1135. https://doi.org/10.1023/A:1012099432480

[15] Brown, J. (1995). Faster than the speed of light. New Scientist, 146(1971), 26–30.

[16] Steinberg, A. M., Kwait, P. G., & Chiao, R. Y. (1993). Measurement of the single photon tunneling time. Physical Review Letters, 71(5), 708–711. https://doi.org/10.1103/PhysRevLett.71.708

[17] Wang, L. J., Kuzmich, A., & Dogariu, A. (2000). Gain-assisted superluminal light propagation. Nature, 406(6793), 277–279. https://doi.org/10.1038/35018520

[18] Galigiuri, L. M., & Musha, T. (2014). Quantum vacuum dynamics, coherence, superluminal photons and hypercomputation in brain microtubules. Applied Numerical Mathematics and Scientific Computation, 105–115.

[19] Bajlo, D. (2017). Measurement of advanced electromagnetic radiation. Zenodo. https://doi.org/10.5281/zenodo.247283

[20] Bajlo, D. (2017). The hidden arrow of electromagnetic radiation: Unmasking advanced waves. 25 September 2017.