

# A Theoretical Hypothesis for the Disappearance of Stars without Undergoing Supernova Explosion

Lipoknukshi Jamir

Independent Researcher, Mokokchung, Nagaland, India

Author's Mail Id: lipoknukshi.jamir@gmail.com

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**Abstract**— N6946-BH1, a star in the Fireworks Galaxy, has been reported to have disappeared mysteriously without undergoing supernova. Also, studies suggest that a massive star in the galaxy PHL 293B has also vanished without undergoing a supernova explosion. These stars are thought to have collapsed to become a black hole. However, before turning into a black hole or a neutron star, a star must undergo supernova explosion. But this is not the case for the two stars in the galaxy Fireworks and PHL 293B respectively. Basing on the hypothetical theory, if anything escapes a black hole then the object will go to the future in space-time, this paper presents a possible theoretical hypothetical explanation as to what might have happened to the stars in these two galaxies. If the stars were under the influence of gravitational field of a black hole, then hypothetically, there is possibility that the stars might have gone into the future. And if this is the case, then, at one point in space-time the stars will reappear again and we will be able to detect its presence. However, further extensive experiments are needed to prove the same.

**Keywords** — Black hole, supernova, N6946-BH1, Fireworks Galaxy, PHL 293B

## I. INTRODUCTION

The death of a massive star is marked by supernova explosion which is then followed by the formation of either a black hole or a neutron star [1, 2, 3]. However, this is not so for the star N6946-BH1 in the Fireworks galaxy. Instead, the star has been confirmed to have disappeared from the galaxy [4]. Another massive star, in the galaxy PHL 293B, has also been reported to have disappeared without undergoing supernova explosion [5].

Researcher have attributed two possible hypotheses to explain this occurrence. One where the star being obstructed by dust particles; and the other the possibility that the star being collapsed to a black hole without undergoing supernova [5].

However, according to a theoretical hypothesis, if an object orbiting a black hole escape from the gravitational field of the black hole, then, the object will undergo time-dilatation and this will cause the object to travel in time and it will seem to have vanished or disappeared from the present space-time [6].

This possibility cannot be ruled out and basing on this hypothesis, this paper gives a possible explanation of what actually could have happened to the stars in these two galaxies - Fireworks and PHL 293B respectively.

## II. THEORY

General and Special relativity clearly predicts and support time-dilatation. Basing on these concepts we can hypothetically conclude that a particle revolving around a black hole will undergo time travel and can reappear at a different space-time in the future [6].

Here, in this paper, basing on this hypothetical concept, we will theoretically analyze the possible cause for the disappearance of the two stars in Fireworks and PHL 293B galaxies respectively.

## III. EXPERIMENTAL PROCEDURE

This article provides a theoretical argument basing on general and special relativity to give a hypothetical explanation for the disappearance of stars from galaxy Fireworks and PHL 293B respectively, without undergoing supernova explosion.

## IV. RESULTS AND DISCUSSION

### A theoretical hypothesis for the disappearance of stars in the galaxy Fireworks and PHL 293B

The stars in the galaxy Fireworks and PHL 293B, assuming that they are under the gravitational influence of a black hole or any other strong gravitational field, could possibly undergo time-dilatation. When this happens, there will be a difference in time elapsed for an observer on

earth and an observer on the star. This could lead to the possibility of the star going further ahead in space-time.

If the star is revolving around a black hole, then, the possibility is that the star will try to gain momentum and will try to escape from the influence of the gravitational field of the black hole. When the star gains sufficient velocity to overcome the gravitation field of the black hole, the space-time around the star will be sufficiently dilated. At this point, the star will move forward towards the future. As a result, to the observers on earth, it will seem as if the star has vanished.

If we continue to observe the spectra from these galaxies, then we may detect the presence of the star in the near future, depending on how much space-time has been dilated in the process.

General and special relativity clearly supports this hypothesis and if the two stars in these respective galaxies were under the gravitational influence of a black hole (or any other strong gravitational field), then the explanation by this hypothesis can be a possibility for their disappearance.

## V. CONCLUSION AND FUTURE SCOPE

The cosmos holds many unanswered questions and, the disappearance of the two stars in the galaxy Fireworks and PHL 293B respectively, without supernova explosion is one such unanswered question. And therefore, development of new theories is crucial at this juncture.

At present, the hypothetical theory basing on which this paper tries to answer the disappearance of the two stars, is vague by itself and further research and experimentation is needed to prove the same.

If this hypothesis can be proved experimentally, then, it will pave new ideas and change our understanding and perspective of the universe.

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## AUTHORS PROFILE

Mr. Lipoknukshi Jamir completed his B.Sc. (Physics), M.Sc., B.Ed., in the year 2015, 2017 and 2019 respectively. He completed his Masters in Physics from Nagaland University, Nagaland. The author made his first research publication in 2020 (Black Hole: Why we are not able to detect anything escaping it). As an independent researcher, the author is actively working towards more research in future.

