

Science Academique

Ray S.

Pages: 0-01

Editorial

Gravastar: an alternative to Black Hole

Saibal Ray*

Department of Physics, Government College of Engineering and Ceramic Technology, Kolkata, West Bengal, India

***Corresponding author:** Saibal Ray, Department of Physics, Government College of Engineering and Ceramic Technology, Kolkata, West Bengal, India

Citation: Ray S (2020) Gravastar: an alternative to Black Hole. Sci Academique 1(1): 0-01

Received date: 02 September, 2020; **Accepted date:** 10 September 2020; **Published date:** 14 September 2020

Einstein's general relativity (1915) offered Schwarzschild (1917) first to model of a black hole via his astrophysical solution which is supposed to be the end point of gravitational collapse. Therefore, earlier black holes were considered merely a theoretical speculation rather than real existing astrophysical objects of the universe. Recently, especially after the successful detection of gravitational waves from black holes collisions and the possibility of looking at an astrophysical black hole, have made this bizarre object a hot topic in the current gravitational research.

However, there are lots of debates regarding the final state of a stellar collapse in astrophysics just like the initial state of the universe in cosmology. In 2001, Mazur and Mottola came up with the idea of a gravitational condensate star or gravastar (Gravitationally Vacuum Star) as an alternative to a black hole, which they further developed in 2004. This is of three-tier composite object where the entire system can be defined by different equation of state (EOS) as follows: (1) Interior core ($0 \leq r < r_1$): $p = -\rho$, (2) Intermediate shell ($r_1 \leq r \leq r_2$): $p = +\rho$, and (3) Exterior sphere ($r_2 < r$): $p = \rho = 0$.

Now the question arises regarding the possible existence and detection of the gravastar. Though there are no direct evidences to detect gravastar but some of the indirect ways have been discussed in literature. The idea for possible detection of gravastar as proposed by several scientists are as follows: (1) the study of gravastar shadows, (2) application of the technique of gravitational lensing, especially microlensing effects of larger maximal luminosity compared to black holes of the same mass, (3) the ringdown signal of GW 150914 by interferometric LIGO detectors.

So, possibly gravastar is becoming a prominent competitor of black hole in the future astrophysical as well as cosmological researches.