ISSN: 2456-1363
International Journal of Scientific Research & Growth
A Multidisciplinary Peer Reviewed and Refereed International Journal
Volume-2 Issue-4 October- 2017
www.ijsrg.com
editor@ijsrg.com

Nuclei Gravitational Contraction

Dr. Shobha Lal
Professor of Mathematics and Computing, Dean Faculty of Engineering and Technology, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India
E-mail- dean.fet@jvwu.ac.in

Abstract
Modern form of the problems of gravitational collapse dates back to the work of Chandrasekhar and Landau(in the 1930's), who first showed that the normally accepted physical laws do not permit the existence of any cold static equilibrium states(whether in planetary, white dwarf or even neutron star form) for bodies more than one or two times as massive as the sun, since the formation of stars up to several tens of times more massive than this occurs frequently within our galaxy and since such massive stars burn up their nuclear energy reverses extremely rapidly by comparison with cosmological times scale it is hard to avoid the conclusion that many stars within our own immediate neighborhood must already have reaches the stage of being faced with runway gravitational collapse. This poses on our hand the theoretical problems of understanding what goes on in such a collapse and on the other hand the observational problem of recognizing and detecting the collapse objects which presumably exist around about
Key Words: *Astronomy, Space Energy, Gravitational Collapse, Astrophysics, Relativity.*

1- INTRODUCTION

For a long time the attention of astrophysicists has been directed towards the understanding of the nuclear processes occurring in the evolution and energy generation of the stars. Only recently it has become apparent that the late stages of evolution of a star is uniquely characterized from the energetic point of view by gravitational and rotational energy, and that the most violent and energetically relevant moments in the life of a star indeed takes place after the exhaustion of the nuclear sources of energy has occurred. Gravitational interaction either slowly generating the luminosity of white dwarfs through their continuous contraction or producing up to 105 L in the accretion process in X-ray sources or again completely determining the physical processes during gravitational collapsed or in the description of the totally collapse objects ensuing from gravitational collapse, appear to be more and more the back-bone, the only fundamental field theory, of this drastically new domain of physics. In this sense the in-depth analysis of a relativistic theory of gravity has become in the recent years not only much more easy due to the existence in nature of collapse objects, but also much more relevant to our understanding of a very large number of physical processes.

If we turn to the long range program of research we have seen in the recent years the preparation of an entire new Chapter of Astrophysics what we could call "Burst Astronomy". Detectors of gravitational radiation of neutrino are all rapidly improving in sensitivity and sophistication while in the theoretical field basic advances are made in the analysis of fully relativistic short time phenomena. In the next few years we should be able to reach in all these different experimental fields the limits of detachability theoretically predicted. The direct observation through different techniques of the moment of gravitational collapse appear to be of the great interest. More we learn of the physics characterizing the configurations of equilibrium of cold catalyzed matter, the more we see this need of processes of gravitational collapse to occur under a variety of regions. It is also clear that it is unavoidable that all collapsed objects we are today observing either in pulsars or in binary X-ray sources had to be formed through this process.

2- SPECTRA VISION

The observation of the moment of gravitational collapse will disclose among others one of the most fundamental predictions of general relativity namely that gravity, as any other long range interaction has to propagate with a finite velocity equal to the speed of light and that gravitational energy can be carried by waves. The direct technological advance brought by these observations will most likely be very limited the influence however for our understanding of nature will certainly be enormous. The moment of gravitational collapse appears since now to be the most energetic process occurring inside a galaxy second in the entire universe to the formation of the universe itself. This brings us to another domain of physics also dominated by a fully relativistic theory of gravity Cosmology. The greatest sources of our research on gravitational collapse will be reaches if not only we will be able to describe using different techniques and detailed theoretical work the physical process occurring in this very short phenomena but if we will be able to apply to cosmology the enormous amount of knowledge we are acquiring in this research.

Recent developments in Astronomy and Astrophysics - e.g., the discovery and study of quasi-stellar sources of explosions in galactic nuclei of strong extra solar X-ray sources and of pulsating radio sources - have led to a reawakening of interest in the possible roles in nature of relativistic systems with strong gravitational fields. Thus far, this interest lies concentrated largely on the roles which relativistic stars might possible play in various astrophysical situations. As a result, such effort has been expended on studies of the structures and stabilities of the relativistic stars.

The modern form of the problems of gravitational collapse dates back to the work of Chandrasekhar and Landau(in the 1930’s), who first showed that the normally accepted physical laws do not permit the existence of any cold static equilibrium states(whether in planetary, white dwarf or even neutron star form) for bodies more than one or two times as massive as the sun, since the formation of stars up to several tens of times more massive than this occurs frequently within our galaxy and since such massive stars burn up their nuclear energy reverses extremely rapidly by comparison with cosmological times scale it is hard to avoid the conclusion that many stars within our own immediate neighborhood must already have reaches the stage of being faced with runway gravitational collapse. This poses on our hand the theoretical problems of understanding what goes on in such a collapse and on the other hand the observational problem of recognizing and detecting the collapse objects which presumably exist around about us.

3- CONCLUSION

These questions have given rise to such wide spread and intense interest and activity in the last few years that it is hard to understand why apart from a very small number of individuals (including most notably J.R. Oppenheimer and J.A. Wheeler) Very few physicists gave any attention at all such phenomena prior to 1960 and why they were neglected even longer by observational Astronomers who tended to brush aside collapsed objects as figments of the theoreticians imagination. Today, however, the situation has been revolutionized. On the one hand every substantial process on the basis of Einstein’s General Theory of Relativity - has been made on the theoretical collapse problem during the last decade and on the other hand Astronomers have tended to take theoretical predictions much more seriously since the 1968 discovery of pulsars, which lead in particular to the configuration of the long standing prediction of the existence of a neutron star at the heart of the "Crab Nebula".

The other massive line of investigation deriving from Penrose's paper has been the study of what are today known as "BLACK HOLES", that is to say extended regions of space-time (containing the singularities in their interiors) where the gravitational field is to say extended regions of space-time (containing the singularities in their interiors) where the gravitational field, although finite, is sufficiently wrong to prevent the escape even of particles moving with the velocity of light. In the formation of a black hole bounded by a horizon at the Schwarzschild radius was already well known.

4- REFERENCES

[1] S. Chandrasekhar; Phil. Mag.7, 63, 1929, also Mon. Not. Roy. As. Soc. 91, 456(1931).

[2] L. Landau; Phy zeit. Soviet 1, 285 - 1932.

[3] S. Chandrasekhar; Astro Phys. Vol. 74, p. 81(1931).

[4] J.R. Oppenheimer and Harti and Snyder; Phy. Rev.(Sept.-1939).

[5] J.R. Oppenheimer and G.M.Volkoff; Phy. Rev., Vol.55, p. 374(1939).

[6] R. Penrose; Black holes, Sci. Amer. (U.S.A.), Vol. 226, No. 5, p. 38-45(Mar. 1972).