

## RELATIVISTIC MODELING OF RADIATING FLUID BALL WITH OCCURRENCE OF HORIZON

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*Dedicated to Prof. A.M. Mathai on his 80<sup>th</sup> birth anniversary*

**Abstract:** The objective of this paper is to present a new class of exact solution of the Einstein field equations for a spherically symmetric shear free isotropic fluid collapsing under its own gravity and undergoing radial heat flow due to Tewari [1]. The interior metric fulfilled all the relevant physical and thermodynamic conditions that matched with Vaidya exterior metric over the boundary. At the beginning, the interior solutions represent a static configuration of perfect fluid which later on gradually starts evolving into radiation collapse. Consequently we have obtained the expressions of various physical and thermal parameters and found that they are physically reasonable for a set of model parameters and there are a number of such parameters for which the solution is well behaved. The final fate of our model is formation of black hole.

**Keywords:** Exact solutions, Gravitational collapse, Radiating star, Black hole, Naked singularity.

### 1. Introduction

The attractive character of gravitational collapse is the formation of a star from nebulae, galaxies and cluster in astrophysics. The balance of any star is totally depends on the balance of two incompatibility effects. The internal thermal pressure of an element contracting the material of the star in the stellar interior and the opposite gravitational force attracting the same towards the centre. When this reaction end and no other source of pressure acts on this, this balance is broken