



Physical Research Laboratory, Ahmedabad

Colloquium 20_13

- Speaker:** Prof. Pankaj Joshi
Vice-Chancellor (Provost) & Founding Director, International Center for Cosmology (ICC), CHARUSAT University, Anand.
- Title:** “Beyond Penrose -Blackholes and Spacetime Singularities.”
- Date and Time:** Wednesday, 09 December 2020, 16:00 – 17:00 hrs
- YouTube Link:** <https://www.youtube.com/watch?v=0MW7MQAKHok>

Abstract

Exciting developments have taken place in recent times in blackhole physics and gravitation theory. The recent observations on gravitational waves and imaging the compact object at galactic centers have given many new insights into the nature of Einstein theory of gravity. Spacetime singularities have been a central feature driving many of these breakthroughs, which are extreme compact regions in cosmos where all physical quantities such as matter densities, curvatures and others are arbitrarily high and the gravitational force is at its extreme. We discuss here these entities, namely singularities and blackholes, the work that was given the physics Nobel this year. We show how general relativity indicates that spacetime singularities are inevitable consequence when massive stars collapse on exhausting their internal nuclear fuel. The key open question today at the frontier of fundamental physics is, whether such singularities are visible to faraway observers in the universe, or they would be always hidden within blackholes. We review recent developments here, including our own work, which have far-reaching observational and theoretical implications on our basic understanding of the universe, including future quantum gravity theories.

The Speaker

Prof. Pankaj Joshi was a Senior Professor with the Tata Institute of Fundamental Research, Mumbai, before joining Charusat University, to establish a Cosmology Centre there. His research in the fields of gravitation and cosmology is reported in more than 200 research papers in journals of repute, and in monographs from OUP (Oxford) and CUP (Cambridge). Prof. Joshi has made fundamental contributions in black hole physics, his extensive analysis of general relativistic gravitational collapse providing significant insights into the final fate of massive collapsing stars in the universe, formation of space-time singularities, and cosmic censorship. He held visiting faculty positions in several countries, is elected to Fellowships of scientific academies, and has won several awards, including INSA-Vainu Bappu Memorial award, Gravity Research Foundation (USA) award, Prof A C Banerji Gold Medal and Memorial Lecture award, and C V Raman lecture award (DAE). He has also contributed a large number of books and articles towards science outreach and has given many public lectures.

ALL ARE WELCOME

