



2021-22

Name of the Department/Society: **Department of Physics & Electronics/LUMEN**

Name of the Event 3: Webinar: 'Unveiling the Enigma of Black Holes': On the book 'The Rise and Fall of the Black Hole Paradigm'

Date of the Event: 31st October 2021

Esteemed guest speaker: Dr Abhas Kumar Mitra, the revered Astrophysicist who is widely known for his distinct take on the theory of black holes shared his knowledge in this webinar. The speaker embarked on Newtonian mechanics and the GTR, which strongly supports the concept of black holes. Delving deeper, he raised reasonable concerns about their existence. Demonstrating his stance through research papers, he provided a clear and concise explanation by clearly distinguishing between black holes and their mimics. All queries were also addressed.

Few Words About Special & General Relativity

NEWTONIAN: dX & dT Same For All (INVARIANT)

SPECIAL RELATIVITY: No Gravity

$+c^2 dT^2 - dX^2 =$ Space Time Interval = Same for all

$dT^2 (c^2 - v^2) =$ Same for All; $v = dX/dT$

For material particles:
Spacetime Interval = $dT^2 (c^2 - v^2) > 0$; $v < c$

For Photons: Space Time Interval = 0
 $dT^2 (c^2 - v^2) = 0$; $v = c$

Components $(+1, -1)$: Sp Time Interval $+dT^2 - dX^2$

Q. What Are Compact Stars/Objects?
Stars Having Extremely Deep Potential GM/R
Make it Dimensionless Pure Number: GM/Rc^2

SUN	WHITE DWARF	NEUTRON STAR
$M \sim 10^{30}$ kg	$M \sim 1 M_{\text{sun}}$	$M \sim 1 M_{\text{sun}}$
$R \sim 7$ lac km	$R \sim R_{\text{earth}} \sim 0.01 R_{\text{sun}}$	$R \sim 10$ km!!
3 parts of millionth $\sim 3 \times 10^{-6}$	Compactness \sim 3 parts of thousand	Compactness ~ 0.1
		Mag Field \sim Trillion G