

Black holes do not exist

Abstract: The body can not contract to infinite density due to the existence of repulsive force. It is proved that the escape velocity of the maximum contracted body is equal to the free space velocity of light. Therefore the black holes do not exist.

The two bodies of rest mass m_0 and M_0 are separated by distance r . The magnitude of force of attraction between two bodies due to their negative energies is $F = G m_0 M_0 / r^2$

We can measure gravitational force acting on the body m_0 by measuring the rate of change of momentum.

$$F = dp/dt = (dm/dt)v + m(dv/dt)$$

When the body is allowed to free fall the change in potential energy of the system is equivalent to the change in kinetic energy of the system.

The kinetic energy is equivalent to mass. The change in potential energy of the system depends only on initial and final position. Therefore the amount of increase in mass of the body depends only on the initial and final position of the body and is independent of time.

Therefore $dm/dt = 0$

$$F = m dv/dt = ma$$

At distance r , the body m_0 is at rest. Therefore $m = m_0$

This yields $a = G M_0 / r^2$

The acceleration of the body is constant and is independent of the mass of the body.

The work done by gravitational force on the body of mass m_0 is

$$W = (\text{integral}) F \cdot ds$$

The gravitational force accelerates the body from $v=0$ to $v=v$

$$W = m (dv/dt) ds$$

$$W = m v dv$$

$$E = (1/2) m v^2 \text{ where } m = m_0 + E/c^2$$

$$\text{Where } m = m_0 / (1 - (1/2)(v/c)^2)$$

This is the equation for variation of mass of the body in the gravitational field.

For escape velocity, the total mechanical energy of the system is zero.

$$(1/2)mv^2 = G m_0 M_0 / r^2$$

$$\text{Therefore } v_e = \sqrt{2GM_0 / (r + GM_0 / c^2)}$$

It is proved that the body can not contract to infinite density and smallest radius is given by

$$r(\text{min}) = GM_0 / c^2$$

Therefore escape velocity $v_e = c$

This shows that the escape velocity is equal to free space velocity of light. Therefore black holes do not exist.

References:

1. Wikipedia
2. viXra:1107:0058