About the Gravitation

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Abstract: The curvature of the space is the Gravitation Constant $G$.

1 The curvature of the space

Einstein's first formula on the General Theory of Relativity was (see [3]):

$$ R_{ik} = \frac{8\pi G}{c^4} T_{ik} $$

This formula in a scalar sense is ($\epsilon = \text{Energy density}$):

$$ \frac{1}{R^2} = \frac{8\pi G \rho c^2}{c^4} = \frac{8\pi G \epsilon}{c^4} $$

Now we multiply the above equation with $R^4 \epsilon^4/(8\pi G)$ and receive:

$$ \frac{\epsilon^4 R^2}{8\pi G} = \epsilon R^4 = \text{const} $$

It follows that $\frac{G}{R^2}$ ist constant.
2 Calculation of the Gravitation Constant $G$

The formula for a Black hole is ($M = \text{Mass of Universe}$):

$$\frac{GM}{R} = c^2$$

Now we divide the above equation with $MR$ and receive:

$$\frac{G}{R^2} = \frac{c^2}{MR}$$

The product of $MR$ is given by:

$$MR = \frac{4\pi R^4 \rho}{3}$$

3 References

1. Landau.Lifschitz, Klassische Feldtheorie
