

About the Gravitation

Peter H. Michalicka
Email: Peter.Michalicka@gmx.at

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Abstract: The curvature of the space is the Gravitational Constant G .

1 The curvature of the space

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

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

The component of above is ($\epsilon = \rho c^2 = \text{Energydensity}$):

$$\frac{1}{R^2} = \frac{4\pi G \rho c^2}{3c^4} = \frac{4\pi G \epsilon}{3c^4}$$

Now we multiply the above equation with $3R^4 c^4 / (4\pi G)$ and receive (see [1]):

$$\frac{3c^4 R^2}{4\pi G} = \epsilon R^4 = \text{constant}$$

It follows that $\frac{G}{R^2}$ ist constant (see [2]).

2 The Gravitational Constant G

The formula for a Black hole is ($M =$ mass of Universe):

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

Now we divide the above equation with MR and receive:

$$\frac{G}{R^2} = \frac{3c^2}{4\pi R^4 \rho} = \frac{c^2}{MR} = \text{constant}$$

3 References

1. Landau.Lifschitz, Klassische Feldtheorie, ISBN-10: 3055015509
2. Arbab I. Arbab, Cosmological Models With Variable G an Lambda and Bulk viscosity, arXiv:gr-qc/0105027
3. Einstein, Albert, Zur allgemeinen Relativitaetstheorie, 1915, Sitzungsberichte der Preussischen Akademie der Wissenschaften zu Berlin