Limits of General Relativity

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Abstract

Einstein's equation allows us to formulate the boundaries of the general theory of relativity in the form of a force and energy criterion.

Text

It is curious - even without understanding the Einstein equation, it is not difficult to see in it the force or energy criterion for the existence of the World in the general theory of relativity - it is enough to divide both parts of the equation into the energy-momentum tensor. In other words, taking c and GN constant, one can afford to come up with various scenarios for the transition from the initial to the final, current state of the World, so long as the criterion is not violated. Within the framework of such an approach, it is permissible to consider general relativity as the thermodynamics of the visible universe.

By the way, if you work with SI dimensions and use the Planck units of length and mass, then the factor $8 \cdot \pi$ in the Einstein equation is not needed.

The force and energy criteria GR, according to the Einstein equation with the lambda term and SI dimensions, are shown in the figure 1.

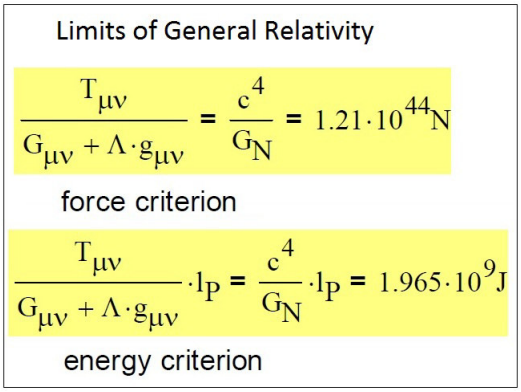

Figure 1. Thermodynamic limits of general relativity

Instead of conclusions

GR and thermodynamics twin sisters -
the same clan and tribe.
Everything is subject to them - except Time.
The peculiarity of time amazes us -
it, like money - is always lacking.