

## HAVEL'S THEORY OF GRAVITATION

Havel's Theory of Gravitation (HT), described in [1], has been developed from the ground zero, without using any other theory, by relying only on the basic rules of physics and mathematics.

Unlike the prior theories of gravitation (Newton's Law of Gravitation and Einstein's general relativity), which provide mathematical equations and very little physical explanation, HT starts with the detailed physical analysis of the behavior of gravitation, from which it develops the mathematical model of gravitation.

HT is based on two basic hypotheses:

1. Each atom keeps continuously emitting the carriers of gravitation, called vacuons, randomly in all directions. The vacuon is a tiny ball of vacuum which contains no matter or energy and carries no force. The vacuon flies in a straight line at a finite speed.
2. Gravitation is conveyed by hits of vacuons on atoms in the receiving body. Each hit by the vacuon causes a minuscule change in the velocity of the receiving atom. The vacuon acts merely as a catalyst – the atom provides whatever is necessary for the amendment of its velocity. Repeated hits by vacuons cause repeated changes in the velocity of the receiving atom, which is acceleration by definition, against the direction of the vacuons. All atoms within the receiving body are accelerated in parallel, regardless of its size and shape. This is the physical explanation of the acceleration by gravitation in HT.

From these two hypotheses has been developed the new law of gravitation in the mathematical form:

$$a = -G \sum_{i=1}^{n-1} D_i$$

where:

- the minus sign indicates that the acceleration is against the direction of vacuons
- $a$  is the acceleration of the  $n$ -th body imparted by gravitation of all remaining bodies
- $G$  is the constant of gravitation
- $i$  is the index pointing to the  $i$ -th body
- $n$  is the total number of bodies
- $D$  is the density of vacuons (intensity of gravitational field) caused by the  $i$ -th body

The new law of gravitation is somewhat similar to the Newton's inverse-square law. However, there are many important distinctions:

- The new law of gravitation is valid for any number of bodies.
- In the new law, gravitation propagates at a finite speed.
- In the new law, gravitation is not the attraction between the two bodies, but the acceleration against the direction of vacuons.
- In the new law, the Newton's single mighty gravitational force and the single mighty gravitational mass do not exist.
- In the new law, the Einstein's curved space-time does not exist.

HT makes these new predictions:

- It solves the  $n$ -body gravitational problem.
- It predicts the basic shapes of galaxies.
- It proposes a third model of the Universe (the first one is Steady State and the second one is Big Bang).

[1] Havel, Karel, *Gravitation: master key to the universe* (ISBN 0-9689120-0-1), Brampton: Grevyt Press, 2003.

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