New Conception of Space Curvature

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Abstract

According the new statement of Space, Space and the Force field are synonyms. Therefore Space is curved in the same way as a gravity field around celestial bodies. Far away from stars and planets Space is flat. The gravity Space is curved around each atom in micro scale distances.

Keywords: space, gravitation, curvature, Unified Field Theory

PACS Classification codes:

04. General relativity and gravitation; 03.50.-z Classical field theories; 12.10.-g Unified field theories and models

Curvature of Space by Newton

Absolute space [1], in its own nature, without regard to anything external, remains always similar and immovable. Relative space is some movable dimension or measure of the absolute spaces; which our senses determine by its position to bodies; and which is vulgarly taken for immovable space; such is the dimension of a subterraneous, an aereal, or celestial space, determined by its position in respect of the earth. Absolute and relative space, are the same in figure and magnitude. End of quotation.

It is Euclidean 3D space linear and independent without any curvature (Fig. 1.).

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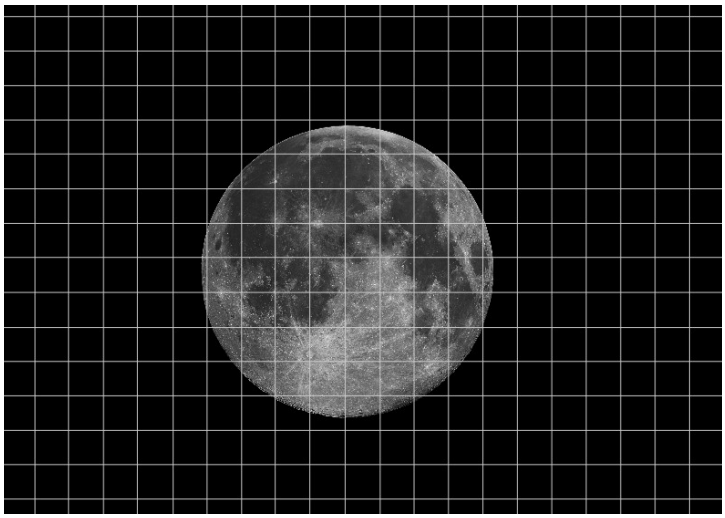

Fig. 1. Cross section of Space coordinates according to Newton.

According Newton the gravity is a force. The cause of force is mass. Bodies with mass are located in space, but cannot affect the space anyway. Bodies that are not affected by force are moving straight.

Curvature of Space by Einstein

According to Einstein gravity is not a force. Gravity is a curvature of space (Fig. 2.). The cause of curvature is mass.

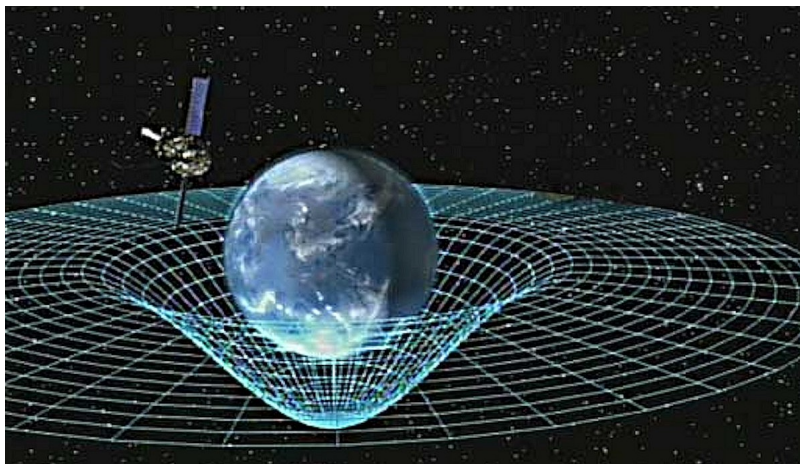

Fig. 2. Curvature of Space according Einstein.

By NASA – http://www.nasa.gov/mission_pages/gpb/gpb_012.html.

It is De Sitter 4D spacetime: 3 dimensions of space and 1 dimension of time. The bodies on which force does not act are moving in geodesics.
The observations confirm with high accuracy that near celestial bodies the space is curved. The gravitational lensing of distant galaxies show that in the vicinity space is curved.
Far from massive bodies no curvature of space is found. The space there is Euclidean.

New approach to curvature of Space

Gravity is a force. The cause of force due to gravity is mass. According to the new concept of space the space and force field are synonyms [3]. The equipotent surfaces and lines of a force field are a coordinate system of space (Fig. 3.).

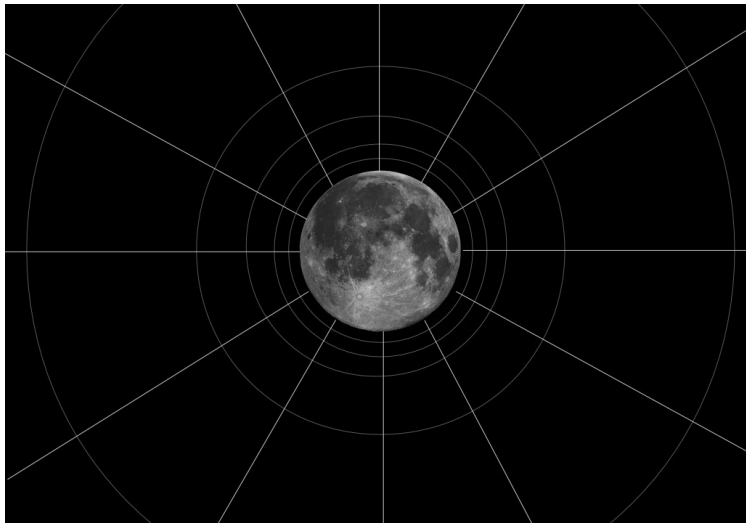

Fig. 3. Natural Curvature of Space

It is Riemannian geometry that is valid near massive bodies. The bodies on which force does not act are moving in geodesics.

Riemannian curved space (Fig. 4.) is around each atom in crystals. The gravity of individual atoms is additive. As the distance from the atoms increases, the curvature of the space decreases. Far apart from the sources of gravity (atoms) the space is flat. It is Euclidean space.

The same properties of space can be observed in an interplanetary medium. Space is curved near celestial bodies. Far away from stars and planets the space is flat.

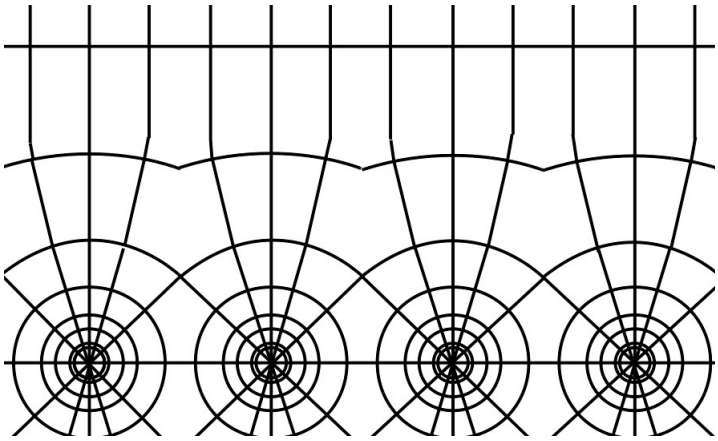

Fig. 4. Curvature of Space near the surface of crystal.
Riemannian space (below) is around atoms.
Euclidean space (above) is far from atoms.

The magnitude of curvature is the same as in the Einstein General Relativity. Therefore one can presume that the new theory has the same accuracy as the General Relativity. The only difference is that there is no need for artificial construct, i.e., spacetime.

References

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Acknowledgements: We are very grateful to Ieva Mazere and Valda Kalniņa for valuable discussions and assistance.

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