

# Introducing Light Force

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## Abstract

Why Earth momentum keeps same angle to the orbit, but moment of momentum changes its angle to the orbit (and to the momentum)? Both momentums behave like vectors (if no reflections) in an inertial coordinate system.

I am neither enemy nor logic nor facts. I'm looking for the Theory of Everything. Many existing theories need to be considered in a complex. So we could dock both General Relativity and Quantum Physics. The axis of the rotating bullet is constantly directed along the flight of the bullet. Therefore, a bullet in a circular orbit around the Sun is not pointed at a single point on the Celestial Sphere. Therefore, the Earth's axis in orbit around the Sun should make a full circle (with an angular radius of about 23 degrees) for one year. Why does the Earth's axis look at the Pole Star, and does not draw this huge annual circle across the sky?

*Make believe I'm everywhere, Given in the light, Written on the pages Is the answer to a never ending story.*

*Rhymes that keep their secrets Will unfold behind the clouds, And there upon a rainbow Is the answer to a never ending story.*

*Show no fear, For it may fade away! In God's hand The birth of a new day!*

What? No mistakes in General Relativity, because it is tested (like by the project "Gravity Probe B")?! Have you heard of Nihilism? The Nihilism is philosophy of deliberate lie. For example, a nihilist knows, that  $2 + 2 = 4$ , but says:  $2 + 2 = 7$ . Some one of Conspiracy Theories is right. The atheism is expression of Nihilism. Hasn't it Mister Donald Trump explained what "fake news" are? Therefore, even reading a Physical Review paper, use your own brain.

## I. LET US TRY WITHOUT FORMULAS

According to the well-known theory of precession, the angular rate of change in the direction of the axis of rotation (for example - the Moon) should tend to zero, as the angular velocity of rotation decreases ( $\Omega \sim \omega \rightarrow 0$ ). The Moon almost does not rotate, but its axis makes (in one lunar month) a huge circular change in direction relative to the stars, because the Moon faces the Earth with one side, but itself moves around the Earth. This means that we have come to a contradiction with the well-known theory of textbooks. Therefore, textbooks do sin against the Truth. They do not like to put into the formulas the Church Grace!

You are a free astronaut in open space, and you rush around the Sun. What do you notice? Your feet are all the time facing the Sun, during all the turns around the star. Your wedding ring is weightless floating at your chest. It is round and quickly rotates around the rim so that you do not notice its rotation: its rotational symmetric. Due to the law of conservation of the rotation axis (conservation of the angular momentum, which is consequence of the “strong equivalence principle” – inner observations can not determine the spacetime position of a closed small and free laboratory), the view of the ring does not change during the entire fall time. You think about your wife and son! They are saved from that deadly asteroid, even though you yourself will not return to them. You’re floating in weightlessness, there’s a ring in front of you. Is latter going to change?! No, it is eternal. It goes with you into eternity. If it changes, it is the action of the Otherworld, violating the law of conservation of the axis of rotation. Force, which forces the axis of rotation of the Earth to rotate after the North Star. The almighty “Light Force”!

## II. SOME FORMULAS

Humankind can perfectly live (at least an year or two) without any Dark Matter, or Dark Energy. But latter are proven to exist: [1]. Obviously, the Nature pays absolutely no respect to Occam’s Raizor! So, let there be Light Force  $K^\mu$  in the Covariant Derivative of the 4dim-momentum

$$\frac{D p^\mu}{d\tau} = F^\mu + K^\mu$$

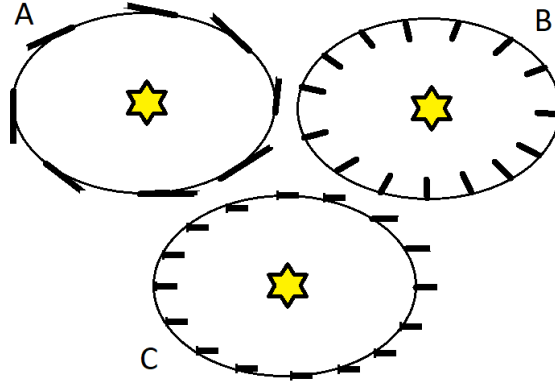


FIG. 1: The look from above on the ecliptic plane, and the projections of the axis of rotation (taken at different time of the year). The A and B show how the vector (axis of rotation) can be parallel transported along the ring-orbit, whereby the  $K^\mu = 0$ . The C shows the actual axis of the Earth, the Light Force  $K^\mu \neq 0$ .

with no principle conditions on  $K^\mu = K^\mu(t, x, y, z)$ . The Light Force is conditioned by any particular situation. The Minkowski Force  $F^\mu$  describes the known matter interactions. Please note, that this holds also for photons, hereby the lightspeed of a photon remains in tact. The  $\tau$  is proper time for bodies, or the geodesic parameter for photons. This simple equation is my generalization of the known Bohmian Mechanics, latter has many fatal problems [2], e.g., it has no theory for photons yet.

Let us prove now, that there are situations, where  $K^\mu \neq 0$  must be.

### III. WHY THE EARTH'S AXIS IS AIMED AT THE POLE STAR?

Distances on so-called "Celestial Sphere" are measured in degrees, not in meters. The axis of rotation of the Earth crosses the Celestial Sphere in the so-called "Celestial Pole". Its position (purely in fact) changes over several thousand years, thus making a complete circle (it is known "precession"). My theoretical circle (angular radius of 23 degrees) lasts only one year.

I came to the conclusion that the axis of Earth's rotation for the year should make a full circle around the ecliptic pole (it is on a perpendicular to the ecliptic plane) with an angular deviation from the ecliptic pole of 23 degrees. Latter value is the inclination of the Earth's axis to the ecliptic plane. If the Earth was a bullet in orbit around the Sun, then the circle

around ecliptic pole in the sky would have the radius of 90 degrees.

THEOREM:

**The axis of the revolving bullet is constantly directed along the flight of the bullet.** *We let out a cloud of bullets from the super-machine gun, they are not rotating, only one bullet in the cloud rotates and the axis of its rotation is initially directed along the flight of the cloud of bullets. As thought experiment let us surround the cloud of bullets with a flying spaceship. In order for non-rotating bullets to be stationary relative to the ship's hull, the hull is directed along the bullet's flight. And since free bullets soar in the weightlessness of the ship, the ship is an inertial frame of reference. And in such a system the law of rotation-momentum conservation of the bullet is fulfilled: the bullet will always be aimed along the ship's hull. The hull flies along the flight of a cloud of bullets.*

The direction (as a "line segment") in the cabin of our ship is  $L^{\hat{\nu}} = (0, \Delta x, \Delta y, \Delta z) = \text{const}$  (but here we can take a constant vector or pseudo-vector with any physical sense). In curvature coordinates  $L^{\mu} = e_{\hat{\nu}}^{\mu} L^{\hat{\nu}}$ . Then, can we tell, that holds direction conservation

$$\frac{D L^{\mu}}{d\tau} = 0?$$

If Yes, then indeed holds  $L^{\hat{\nu}} = (0, \Delta x, \Delta y, \Delta z) = \text{const}$  along the ship's flight. Yes, it holds, because the tetrad vectors  $e_{\hat{\mu}}^{\nu}$  are all geodesics:

$$\frac{D e_{\hat{0}}^{\nu}}{d\tau} = \frac{D e_{\hat{1}}^{\nu}}{d\tau} = \frac{D e_{\hat{2}}^{\nu}}{d\tau} = \frac{D e_{\hat{3}}^{\nu}}{d\tau} = 0.$$

Here, e.g.,

$$\frac{D e_{\hat{3}}^{\nu}}{d\tau} = \frac{d e_{\hat{3}}^{\nu}}{d\tau} + \Gamma_{\mu\alpha}^{\nu} e_{\hat{3}}^{\mu} u^{\alpha}.$$

In Newton Mechanics one knows the angular momentum 3-vector  $\vec{L} = \vec{p} \times \vec{r}$ , hereby the time has certain value, so  $dt = 0$ , and so in four dimensional formalism 4-vector is  $L^{\nu} = (0, \vec{L})$ . However, for high angular velocities the tensor  $L^{\nu\mu}$  is used.

In spherical coordinates  $(r, \phi, \theta)$  the rotation-momentum of Earth is  $\vec{L} = (a(\tau), b(\tau), d(\tau))$ . Since the coordinates are not Cartesian, we do not have the right to take the ordinary derivative  $dL/d\tau = 0$  with the solution  $a(\tau) = \text{const}, b(\tau) = \text{const}, d(\tau) = \text{const}$ , which does not indicate one direction in the Celestial Sphere, since we are dealing with spherical coordinates. So even in this erroneous equation there is no "looking at the North Pole" effect. The covariant derivative of the actual (one which is pointed at the North Star)  $\vec{L}$  is

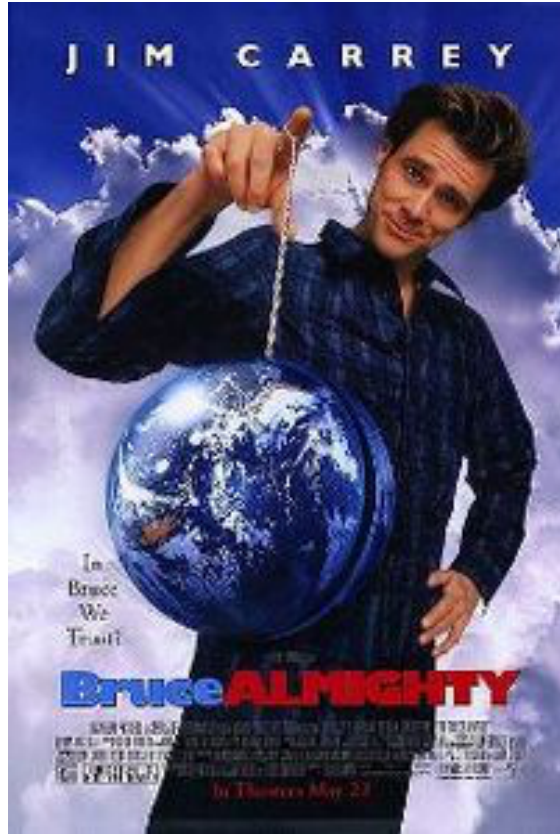


FIG. 2: The poster of the movie “Bruce Almighty” as illustration to the Light Force, which is holding the axis of the Earth directed at Pole Star.

the “Light Force Moment”:

$$\frac{D \vec{L}}{d\tau} = \vec{M}.$$

However, one shall use the 4dim vectors with  $L^\nu = (0, \vec{L})$ . Thus,  $M^\nu = (\Theta, \vec{M})$ . Turns out, that  $\vec{M} \neq 0$ .

#### IV. FOR FORUM QA

Question: How looks the rotation momentum in General Relativity?

In Newton’s theory the Earth rotation has

$$\frac{D \vec{L}(\tau)}{d\tau} = 0.$$

In Cartesian coordinates with flat metric

$$ds^2 = dx^2 + dy^2 + dz^2$$

the solution is directed at the North Star

$$\vec{L} = (0, L_y, L_z) = \text{const}.$$

But in General Relativity we have the curved metric

$$ds^2 = -A(r) dt^2 + B(r) (dx^2 + dy^2 + dz^2)$$

and if we assume

$$L^\mu = (0, \vec{L})$$

with

$$\frac{D L^\mu}{d\tau} = 0.$$

Then the solution is not directed at North Star

$$\vec{L} \neq (0, L_y, L_z) = \text{const}.$$

Thus, there Light Force-field  $K^\mu$  appears in

$$\frac{D L^\mu}{d\tau} = K^\mu.$$

## V. FOUR DIMENSIONAL TENSOR

In Wikipedia “Relativistic angular momentum” is written

$$L^{\hat{\alpha}\hat{\beta}} = x^{\hat{\alpha}} p^{\hat{\beta}} - x^{\hat{\beta}} p^{\hat{\alpha}}.$$

The total angular momentum is a constant tensor:

$$Q^{\hat{\alpha}\hat{\beta}} = \sum L^{\hat{\alpha}\hat{\beta}} = \text{const}.$$

Thus, it remains constant (due to Eqs.(1)), and so the axis of rotation has the same angle to orbit, if the Light Force is zero. But it has not the same angle to the orbit (due to looking at North Star during one year), then the Light Force does exist.

## VI. IN ADDITION TO LIGHT FORCE: FIELDS OF DESTRUCTION AND CREATION

The two substances A and B. The joint energy-momentum tensor is

$$T_{\nu}^{\mu} = a^{-} T_{\nu}^{A\mu} + a^{+} T_{\nu}^{B\mu} ,$$

The creation field  $a^{+} = 1 - a^{-}$  takes discrete values: 0, 1 as function of time and space.

*Through these fields of destruction*

*Baptisms of fire*

*I've witnessed your suffering*

*As the battles raged higher*

*And though we were hurt so bad*

*In the fear and alarm*

*You did not desert me*

*My brothers in arms.*

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[1] Pieter van Dokkum, et al., A galaxy lacking dark matter, Nature 555, 629–632 (29 March 2018).

[2] There are different articles which show that Bohms formula for velocity leads to predictions that contradict the experiment. To these articles there are objections, and replies to objections, and so on a whole debate. I would like to indicate an article to which the supporters of Bohms formalism were unable to bring objections.

L. Hardy, “Quantum Mechanics, Local Realistic Theories, and Lorenz-Invariant Realistic Theories”, Phys. Rev. Lett. 68, no. 20, page 2981, (18 May 1992).

This article is very general, it shows that QM does not admit a substructure of particles which follow continuous trajectories. No assumptions are made about those trajectories, except that they are continuous from source to the detector. Thus, that article rules out the broadest class of trajectories, the continuous ones. That, of course, includes the Bohmian trajectories which are defined as continuous.