the general science journal

The Discovery of the Gravitational Constant as a Specific Stellar Property Simplifies the Description of Gravity

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The most striking about the Sun is the link between the Sun's dynamical data and the Gravity Constant. In a former paper [2], that link has been shown, and the consequences were 1° that elementary forces can be expressed as Coriolis interactions between orbiting gravitons and spinning particles; 2° that the solar spin is caused by the escaping radial light. Here, I suggest the inverse property that the Gravity Constant is defined by the solar dynamics. The consequence of the elimination of one parameter permits one to find more useful information on stars and their planets.

1. The Gravitational Constant

In a former paper [2], I proved, for the Sun, the following relationship between the solar parameters:

$$\upsilon_{eq} \Leftarrow \frac{G m_{Sun}}{2 c R_{eq}^{\ 2}} \qquad (1)$$

Herein : $G = 6.67\text{x}10^{-11}\ m^3\ kg^{-1}\ s^{-2}$,

$c = 3.00\text{x}10^{8}\ m\ s^{-1}$

and for the Sun, $m_{Sun} = 1.98\text{x}10^{30}\ kg$

$R_{eq} = 6.96\text{x}10^{8}\ m.$

and υ_{eq} is the according solar rotation frequency. The arrow expresses an unilateral validity.

The importance of this equation (1) should not be underestimated. It rules the Sun's rotation, based upon the Sun's dimensional properties, but including the Gravitational Constant as well. As we have seen, eq.(1) is a few percentages wrong, probably because the entrainment of the solar particles by light cannot be achieved at the very edge of the Sun's radius, but slightly before that edge, where the matter's density isn't too small.

2. Fundamental interactions between elementary particles [2]

The fundamental property of matter is that it is made of spinning, trapped light.

The basis for the relationship of eq.(1) was found in my interaction hypothesis between elementary particles, which would then, consequently, also rule inertia.

On the one hand, this elementary interaction occurs between light, orbiting about the elementary particles (say, gravitons), which leave that particle, and on the other hand spinning particles ("trapped light"). The interaction itself creates a mechanical common path of both entities, called a Coriolis effect, which effectuates a displacement of the hit particle and that we call commonly "a gravitational attraction force". Inertia as well is ruled by the interaction of the spinning light: when the spinning light is accelerated, it will run across its own spinning light, and the interaction between these gravitons and the spinning particle will engender again, by a Coriolis effect, a mechanical common path, which is commonly called the inertial reaction force.

3. Expanding and imploding stars [3]

However, is it really the equation (1) that is the fundamental scientific equation, or is it merely the following one?

$$G_{Sun} m_{Sun} \Leftarrow 2 c R_{eq}^2 \upsilon_{eq} = \frac{c\ \omega_{eq} R_{eq}^2}{\pi} \qquad (2.a)$$

Is the product of the Gravitational Constant with the mass not just a combination of dynamical properties of the Sun, which was not discovered before, because we used and measured this constant on the Earth only, or perhaps because nobody was foolish enough to propose it?

I found the confirmation for this idea in the expansion of stars to red giants [3]. Evidently, gravity has not much impact upon red giants anymore. At the same time, their rotation speed is very slow and their radius very large. When the red giant stops spinning, its equator remains however an attracting zone and causes its collapse into a white dwarf [3]. At each transformation, the star's gravitational constant changes.

It is very surprising and almost impossible to accept with our actual scientific education, that the Gravitational Constant could differ that much from one star to the other and from one star phase to another. For any active star, we would come to:

$$G_{star}\, m_{star} = 2c\, R_{eq}^2 \upsilon_{eq} = \frac{c\, \omega_{eq} R_{eq}^2}{\pi} \qquad (2.b)$$

The extrapolation I propose is indeed solely verified for the Sun's dynamics, and it will take lots of time before one will be able to check its validity to another star. However, based upon the fundamental deductions out of eq.(1) concerning the interaction between elementary particles, I found more evidence than by mere stellar observatory results [2]. This evidence accounts for the fundamental extended Newtonian laws, i.e. the two fields of gravitomagnetism itself, and moreover, a simple explanation for inertia, which is a local effect, not a global one (as Ernst Mach wrongly suggested and which Einstein wrongly embraced).

4. Variability of the gravitational constant and of mass [5]

The gravitational constant is not the only entity that is variable. As I showed earlier, the fundamental property that we call "mass" is not a scalar but a vector [5]. With time, the orientation of mass particles can change as well. I showed also that oriented particles have a unique property: like-oriented mass-vectors are repulsive and opposite mass-vectors are attractive [4]. However, I also showed why globally, only attracting bodies are found [4]. The variability of both the gravitational constant and mass is very confusing, because the microscopic and the macroscopic descriptions of gravity differ from the orthodox point of view.

Concerning stars, let us consider the macroscopic (which is the more conventional) description only. The left hand of eq.(2b) is generally present in gravitomagnetic equations and they can be replaced by the right hand.

The gravitational constant of a stellar system, possibly containing planets, can be replaced by the right hand of eq.(3)

$$G_{star} = \frac{2c\, R_{eq}^2 \upsilon_{eq}}{m_{star}} = \frac{c\, \omega_{eq} R_{eq}^2}{\pi\, m_{star}} \qquad (2.c)$$

5. Conclusion

The equation (1) represents an intrinsic property of the Sun. I suggested that the equation is valid in all directions, and especially valid to define the gravitational constant in terms of other parameters. I also suggest that this equation is valid for all active stars, because I found eq.(1) out of the fundamental gravitomagnetic equations, which cannot but being general physical laws. The elimination of both the gravitational constant and the mass from these fundamental gravitomagnetic equations reduces the number of parameters in the study of stars and exo-planets significantly and corrects the idea about the constancy of the gravitational constant when comparing different stars. It also clarifies that the star's mass cannot be seen as a scalar but as a vector. The consequence is that mass, as a Newtonian property of a parameter of attraction should be revised, because the vector mass can attract as well repel. Moreover, a star's vector mass is much less a constant over the star's lifetime than solely due to its mass loss by radiation.

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