

Newtonian Physics recovered from General Relativity

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After Einstein confused us with the mess that he made in his mathematics for Special Relativity (SR), he then proceeded to make more mistakes in General Relativity (GR). In SR he introduced the idea of the constancy of light speed, and in GR he returned to the idea of variable light speed. Once the mistakes that he made are corrected, GR (with its variable light speed) turns back into Newtonian Physics; this being obscured by the amount of mistakes he made. Newtonian Physics hence is recovered from Einstein's relativity after the detour he took.

Einstein makes a lot of mathematical mistakes as admitted by Ohanian in his book Einstein's Mistakes, [1] so let's look at correcting some of them.

Going by Einstein's 1911 paper but not by his notation [2], Einstein considers the sum of two energies:

$$E_{\text{total}} = E_A + E_B \quad (1)$$

We know by Einstein that $E = mc^2$ and we could actually derive this equation from Newtonian Physics if we wanted to.

Einstein uses the Newtonian equation of motion:

$$v^2 = u^2 + 2 as$$

v = final velocity

u = initial velocity

a = acceleration

s = distance travelled

Einstein in 1911 forgets the "2" but we won't.

Einstein is now considering light speed as variable.

And he is taking initial speed of light as c so he has

$$v^2 = c^2 + 2 as$$

acceleration he considers as due to gravity, so let us call $g = a$, and let us same $r = s$

$$v^2 = c^2 + 2 gr \quad (2)$$

Now for the equation (1) on the left-hand side he takes

$$E_{\text{total}} = m v^2$$

We are used to using c as light speed, but he now has v as light speed being a greater speed than c .

If we multiply (2) through by m we have:

$$m v^2 = m c^2 + 2 m gr \quad (3)$$

and this is what is equal to (1)

the right-hand-side of (3) we can write:

$$m (c^2 + 2 gr)$$

or further as:

$$m c^2 (1 + 2 gr / c^2)$$

set $\phi = gr$ becomes:

$$m c^2 (1 + 2 \phi / c^2)$$

ϕ is the gravitational potential, it comes from

$$F = mg = GMm/r^2$$

$$g = GM / r^2$$

$$gr = GM/r$$

and gr defined as ϕ

So:

$$E_{\text{total}} = m c^2 (1 + 2 \phi / c^2) \quad (4)$$

Now Einstein uses the equation $E = hf$

where h = Planck's constant

let:

$$E_{\text{total}} = hf_1$$

and

$$m c^2 = hf_2 (1 + 2 \phi / c^2)$$

So (4) becomes:

$$hf_1 = hf_2 (1 + 2 \phi / c^2)$$

we can divide both sides by h :

$$f_1 = f_2 (1 + 2 \phi / c^2)$$

We can then multiply through by λ_2

$$\lambda_2 f_1 = \lambda_2 f_2 (1 + 2 \phi / c^2)$$

Now $\lambda_2 f_2 = c$

and $\lambda_2 f_1$ is not that same speed so call it c' , so we obtain:

$$c' = c (1 + 2 \phi / c^2) \quad (5)$$

Einstein makes a slip here which gets corrected in some of his later accounts.

Now this equation (5) just obeys the normal Newtonian equation of motion:

$$v = u + at$$

v = final speed

u = initial speed

a = acceleration

t = time interval

Equation (5) in form:

$$c' = c + gt$$

can be seen to match with this Newtonian equation of motion

c' = final speed of light

c = initial speed of light

$$\text{and } gt = 2 \phi / c^2$$

It is not surprising because Einstein used the Newtonian equation of motion

$v^2 = u^2 + 2as$ at the beginning.

All of this straightforward maths got confused by Einstein in his paper, when he made he mistakes and did not make clear the steps that he was going through.

Einstein in his SR assumes light speed as constant, then follows a confused mess of maths in his 1905 paper, which takes a great deal of sorting through. Then when he starts GR he goes back to using light speed as variable. Once the maths gets sorted out his GR turns back into Newtonian Physics.

Einstein goes back to using Newtonian equations of motion with light speed as variable, which means that in SR when light speed is constant he is dealing with a scenario of when

$$v = u + at$$

reduces to $v = u$ for $a = 0$

That has only a very limited range of applicability and it must be that the mistakes that Einstein makes in his maths makes it look like his SR has a greater range than it actually has. His relativistic velocity addition is nonsense, and the velocity addition goes back to being Galilean-Newtonian velocity addition in GR.

There at first impression are mysteries – such as why if light obeys Newtonian-Galilean velocity addition – why has this not been noticed before. And the answer is- it has been noticed but the confusion that Einstein has created has obscured that.

Blaze Labs Research website as well as noticing a great deal of what is dealt with in this article informs us:

“The Sagnac setup basically consists of a rotating setup, in which the same beam of light is split in two different paths and then compared at their arrival using interferometry. In 1913, Sagnac and Boyty performed an experiment with light circulating around a rotating table. The fringe shift obtained between east and west heading directions, indicated an anisotropy of speed of light in the direction of earth's own rotation.” [3]

By “anisotropy” what is meant is variable light speed i.e. the experiment detects variable light speed not constant light speed. The variable light speed is dealt with GR (with its maths corrections) and is the usual Newtonian-Galilean velocity addition. This Sagnac experiment is important for that. The Michelson-Morley experiment as dealt with in one of earlier articles is only setup so that it deals with light speed in constant scenario; while the Sagnac shows the variability.

The Sagnac experiment showed the effect of Earth’s movement on light propagation.

Wikipedia [4] admits for the Sagnac experiment:

“In the case of light propagating in vacuum pre-relativistic theories and relativistic physics predict the same. In other words, in the case of propagation in vacuum a

Sagnac experiment does not distinguish between pre-relativistic physics and relativistic physics. Both predict the same.”

That the Sagnac experiment obeys Newtonian Physics is not surprising because as shown in this article GR when corrected turns back into Newtonian Physics. And for the case of SR well that is just confused maths. So we can either interpret Sagnac experiment by Newtonian Physics or the confused maths of SR.

The situation is really as per Walter Babin [5]:

“Relativists will claim the Sagnac effect is valid in relativity, thereby sanctioning the precise opposite of what the theory was to achieve, which is a single wave front common to both observers! A moment's reflection will convince you that without this objective, the theory is redundant.”

i.e. SR is redundant. (Or in my view correct all the maths mistakes in SR and it turns back to Newtonian Physics like GR does.)

There are experiments supposedly upholding SR, but as for example Blaze Labs Research [3] notes they don't really, e.g

“The famous Hafele-Keating experiment performed in 1972, aimed to support special relativity by showing that moving atomic clocks slow down, did in fact find out a less known effect: the east bound clock did in fact show a slowing down, but the west bound clock moved faster than a stationary clock in the laboratory. Unfortunately, raw data, and results which are very important for science get filtered according to what the current accepted theories expect.”

i.e. experiments are being interpreted through SR, and results not expected get “filtered”.

A similar analysis to this paper is carried out by R.L. Collins [6] but he misses out the “2”. He misses out the “2” because he follows Einstein's paper that misses out the “2”, and so illustrates that following someone's paper (like Einstein) a person can easily miss the mistakes.

So correct all the mistakes and we have Newtonian Physics back.

References

[1] Einstein's Mistakes, Hans C. Ohanian, USA 2008 ISBN 978-0-393-06293-9

[2] Based on analysis of: “On the influence of gravitation on the propagation of light,” Einstein, Annalen der Physik, 35, 1911 from: On the Shoulders of Giants, S Hawking, USA 2002 ISBN 0-7624-1348-4

[3] <http://www.blazelabs.com/f-g-gcont.asp>

[4] http://en.wikipedia.org/wiki/Sagnac_effect 2009-04-25

[5] Special relativity and the Sagnac effect, Walter Babin General Science Journal
<http://www.wbabin.net/babin/sagnac.htm>

[6] Gravity slows the speed of light, R.L. Collins
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