

Nobody is perfect: Einstein's "faux pas" discovered

by

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The great physicist Albert Einstein brought out in the years 1905 and 1915 his two important theories of relativity. This was initially received by experts with mixed feelings, to say the least. The breakthrough came when the results obtained through the use of his theory for calculating the deflection of light by the Sun was confirmed by Eddington through observation in 1919. Today we know that these experiments were extremely dubious, but the concept was later confirmed to be reliable, as shown by NASA's Cassini spacecraft. The calculation of Einstein is very opaque, and it is not really clear how he came to the (experimentally correct) result. Einstein managed the feat of calculating the deflection of a small mass (a photon, light) by a large mass (the Sun), although the mass of the photon in the calculation was not involved. Unfortunately, his calculation has turned out to be erroneous.

As part of the refurbishment of Einstein's ideas, the AIAS Institute (Alpha Institute for Advanced Study, [1]) has dealt with this issue, through investigations related to the space metric. As is known, the curved space in Einstein's general relativity theory can be described by a so-called metric. For a spacetime with spherical mass distribution it takes a relatively simple form. The ECE theory (Einstein-Cartan-Evans theory, [1]), an extension of Einstein's theory, provides this form also. It follows that the results based on the investigation of the metric, obtained by ECE theory, are equally valid for the classical theory of relativity, which is used in the "standard physics". One application of the space metric is the calculation of the deflection of light by massive stars. Einstein, shortly after completion of his general relativity theory, used it to calculate the deflection of light by the Sun [2]. During a solar eclipse in 1919, Eddington tried to measure this deflection experimentally. However, this deflection is in fact very small (only a fraction of a second of arc). Therefore many legends have grown around this measurement, and it is probably true that the measurements were too vague and had no probative value. Meanwhile, the alleged deflection anticipated by Einstein's theory has been confirmed by the Cassini space probe, so that the experimental facts of the deflection as such are no longer in doubt.

All the greater was the astonishment when Myron Evans tried to understand the calculation procedure carried out by Einstein, a method which in fact was not documented properly at the time. In a book by Wald [2] this calculation is explained in general terms, but with intermediate results, which cannot be correct. So the solution of an equation of third degree is given by Wald, for which modern computer algebra programs provide an entirely different value, but this is only one small detail. The fact that light is deflected by gravity leads to the assumption that photons are not massless but have a rest mass, although very small. Einstein managed to accept this, but then eliminated the mass from the calculation in order to simplify it (we should remember that there were no computers nor mathematical software packages available in the early twentieth century), so the result is not consistent. In detail Einstein approximated the light ray by the form of a circular orbit near the Sun. This led his calculations to a fractional expression with a hidden zero in the denominator, which gives the whole fraction, at a certain point, an infinite value. On closer inspection one sees that, by adopting the circular path, the photon mass falls out of the calculation and the divergence in the integral calculation appears. So we cannot make use of this approximation.

This is exactly what Evans avoids in his alternative calculation. This new mathematical procedure keeps the photon mass in it, and the mentioned divergence does not occur. Under some additional assumptions (which Einstein also performed), the correct experimental value for the deflection angle is obtained, and more. One can estimate that the rest mass of light particles is about 10^{-41} kg. This is the first reliable estimate of the photon mass.

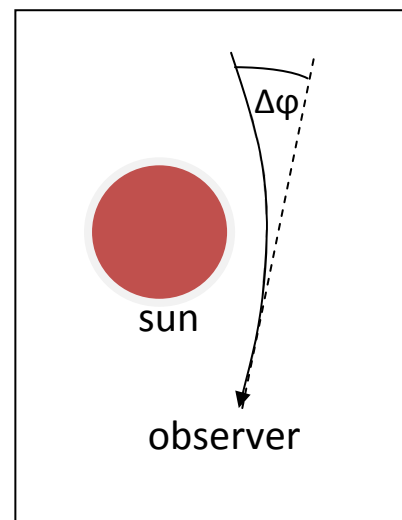
But let us further consider Einstein's solution. As mentioned above, the said formula leads to a divergent integral expression for the evaluation of the deflection angle result. The expression for the integral is not contained in mathematical standard tables, so there is probably no analytical solution at hand. Einstein - however this was achieved – obtains the experimentally correct value of a formula as

$$\Delta\varphi = \frac{4MG}{R_0c^2}$$

where M is the solar mass, G is the gravitational constant, R_0 the solar radius and c the velocity of light. Fortunately, in this age of computer technology, integrals can be evaluated numerically. Evans and his staff have made this numerical effort and obtained a value for Einstein's integral (interestingly enough, almost exactly the number π), which is around six orders of magnitude above the experimental value. This demonstrates the absurdity of Einstein's calculation. Evans and co-workers then evaluated the integral with the alternative formulation they developed and, behold, it yields the correct experimental value [3]!

We have to take into account that Einstein had no computer available and his idea of the photon mass was quite primitive. However, it is surprising that his false procedure has remained hidden for almost 100 years. This is not a good accomplishment for science. It was apparently not deemed necessary, by the whole international scientific establishment, to review the theory, and one should not uncritically accept the findings of others.

The shape of the light ray around a heavy mass even has implications for cosmology. It is believed that extremely heavy stars, so-called black holes, capture light within a certain radius, so that light moves in a circular orbit, like a satellite, around the black hole. According to the findings here discussed of the AIAS Institute orbits of light are not at all possible. There is a maximum deflection angle of about three quarters of a full circle. When the light gets closer to the heavy mass, it is absorbed by it. The near field of a black hole (if there is such a thing at all) behaves probably different from what has been presented to date.



The light deflection theory of Evans [3] can be verified by everyone and speaks for itself. Evans wrote in his Internet blog [4]:

"By now it is well known and accepted scientifically that there are at least two fatal errors in the Einsteinian theory of general relativity, the first is neglect of spacetime torsion, and the second is a huge blunder in the theory of light deflection by gravitation, the same theory that catalyzed Einstein to fame in the early twenties. The ECE theory has set out to correct and develop general relativity. Other criticisms of the Einsteinian era are collected in the forthcoming volume "Criticisms of the Einstein Field Equation" (Abramis 2010) , by M.W. Evans, S. Crothers, H. Eckardt, and K. Pendergast. I have dealt with the consequences of this disaster for standard physics in a www.aias.us essay, which

has been published in "Mikrobit" [5]. I have also recorded a talk on www.aias.us using this essay, and can see that both essay and talk are being read or listened to. The UFT 150 paper was the most read papers of www.aias.us in June 2010. In a time of fiscal austerity, the waste of taxpayers' money on obsolete physics should be curtailed all across the world and switched to new research on energy and counter gravitation. ECE has put both on a scientific footing."

Finally, a word to the critical readers who reject Einstein completely and who rather assume as the cause of the gravitational force an ether flow instead of a curved space: from a mathematical point of view, both concepts are equivalent. The trajectories of a sample mass in the ether or in curved space are identical and are described by the same mathematics. In order to describe fluctuations of the ether, however, Einsteinian theory by itself is no longer sufficient, so it becomes necessary to move on to the ECE theory. Therein, ether fluctuations correspond to a variation of the background potential. Space is not empty, as in Einstein theory, but filled with a potential of high energy density, which is known experimentally from quantum mechanics. All this can be described with relatively simple mathematics.

References

[1] <http://www.aias.us>

[2] R.M. Wald, "General Relativity" (University of Chicago Press, 1984), equation (6.4.41), page 145

[3] UFT Article No. 150, <http://aias.us/documents/uft/Paper150.pdf>

[4] <http://drmyronevans.wordpress.com>

[5] Personal Computer Group Siemens München e.V., <http://www.pcag.de>