

Theory of bending of light on passing through the surface of any object

Bishal Banjara

Abstract— The real science behind the starlight bent during a total solar eclipse is not because of the General Theory of relativity but it's the combine effect of optical power of lens used with the intensity of illumination of visible lights those were coming from the star. In general, it can be any other objects other than extreme gravitational masses to produce such bent of visible lights, thus enhancing to change the entire concepts of space and other natural sciences. The mathematical formulation for such phenomenon is explained by the following equation $\theta = \beta(x_{P_w})/ID_f$ where, letters have their usual meanings.

Index terms—General theory of relativity, bending of light, power of lens, intensity of light, Banjara constant, Bishal's length, Bishal's constant.

1 INTRODUCTION

In the modern history of optics, we have most appreciative works in behave of development of optical solutions for the objects which are transparent and the objects with the reflecting surfaces as like the glass and mirror respectively. Not only this, the concept of bending of light when passing through the surface of extreme gravitational body is well explained in the theory 'general theory of relativity' by Albert Einstein in 1916, which is assumed to be confirmed after astronomers' detection of the bending of starlight on the surface of sun during a total solar eclipse that occurred shortly after the World War-I. Now, this paper illustrates the more approached reality about the phenomenon of bending of light through the surface of all kind of objects that may be opaque/transparent/huge/small etc. which will most probably profound a new direction in optics, concept of gravitational lensing, and the entire modern science, specially the concept of space. In the entire history of nature observation, no one has a complete sense of its occurrence phenomenon but is stepping ahead with the new and more practicable observations those are immersed timely one after another. In the course, this paper will inaugurate modern of the 'modern science' creating a new vision of pure natural science along with the universe.

Talking to Einstein's General theory of Relativity, its basic assumption for propounding the theory, called as 'Principle of Equivalence' equating the forces due to gravitational mass and inertial mass is concept-less ideology he used, as the mass

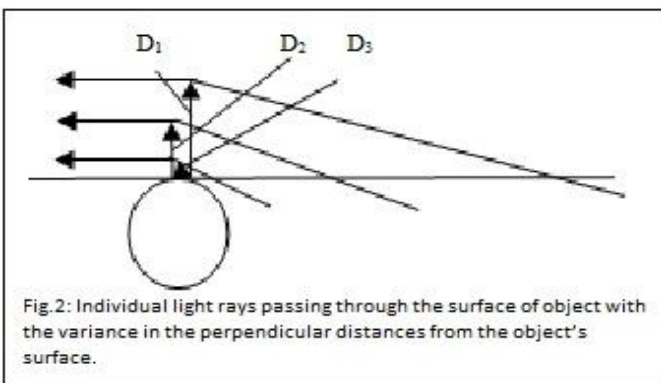
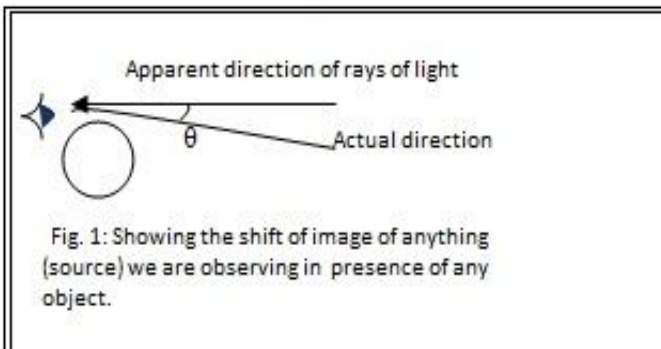
presence in absence and in presence of gravitational field would response differently in term of force measurement, which is well explained in my previous paper entitled as 'Change in concept of Equilibriums and Reformulation for Newton's second law in presence and in absence of gravitational field'. Moreover, the final conclusion to accept his theory by the bending of starlight is not the exact conclusion which today's science beliefs, as I am going to show the real fact for such kind of bending of star lights. The reality behind such bending of light is not due to gravitational field of sun or say space time curvature, but due to the combine effects of the power of lens used to view the light and intensity of illumination of light that is coming from the stars which is well illustrated below.

2 BODY

Any object of any size and shape, any mass or any density posses a surface layer that acts as covering jacket to the total external area of entire object. This layer which covers the entire external area that appears when any object is placed in between our eye and the view point or focus point we are observing. If our focus point is transferred to that object's surface, such surface layer would be disappeared. It means to have such appearing layer; object must be placed in between focus point and the eye. Experimentally, the thickness of such layer along with the diverging property of light remains constant for all kind of object we use. But if the temperature of the object is high then such thickness will be affected due to the lower air density presence around it and that can't be link here because the phenomenon will be different if the experiment would be performed in vacuum, there we can't see such fluctuation in air density. For the crystal clear evaluation of bending of light, let us take an object that may be of any kind(here we are taking spherical one) placed near to our eye

[1] Bishal Banjara is currently pursuing Bachelors Degree in Pure Physics-II yrs in affiliation to Tribhuvan University, Nepal, PH-011683037, +9779849318028. E-mail: leftyb_bb@yahoo.com

such that our eye is focused to see anything far from that object through nearby surface of it. Then, let us observe the phenomenon in presence and in absence of that object. We can see that the things are displaced from their actual position in presence of the object but not if we remove it. Experimentally, I have observed such displacement of the image of the things we are observing is unaffected although if we use the object of different size, mass, shape etc. but such displacement is widely affected by the optical power of our eye and the intensity of illumination of light coming from the thing (focus) we are observing. In the course of experiment, I have used the eyes of minus powers i.e. of near sighted (myopia) and found that the displacement of image is directly proportional to the power of eye but inversely proportional to the intensity of illumination of light coming from the things we observe. And the furthermore, the individual light rays passing from the surface of object will not passes from the equal distance difference from its surface. Thus, for individual rays on passing suffers the variance in the deflection scale, it means the individual rays of near approach to the object get more deflection then others, a little far from its surface showing that the perpendicular distance (D) from the surface of object to the individual rays is inversely proportional the value of θ as shown in fig.2 below which is calculated by a single ray consideration which is passed through the distance (D) from the object's surface.



Mathematically,

the shift of image i.e. the deviation in actual direction of light (θ) coming from the source is directly proportional to power of the lens (P_w) we use. i.e.

$$\theta \propto P_w,$$

Intensity of illumination of light source (I), the lens is focusing i.e.

$$\theta \propto 1/I \text{ And,}$$

Perpendicular distance (D) with the individual ray of light from the surface of object i.e.

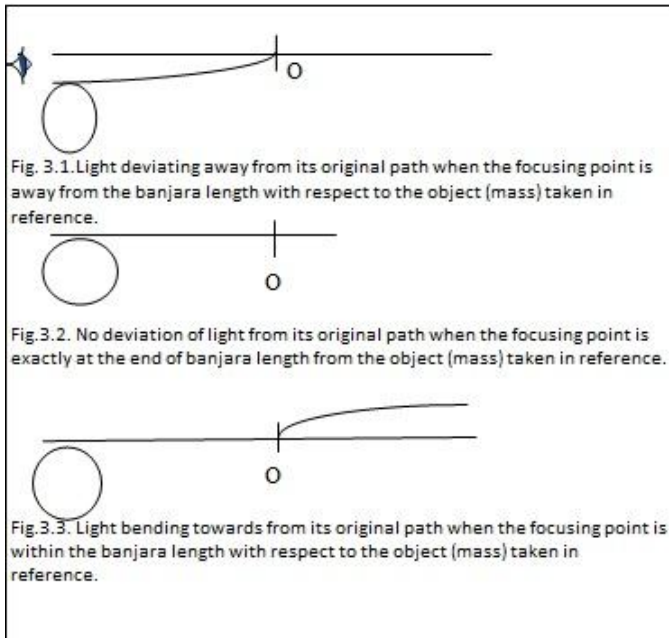
$$\theta \propto 1/D$$

Thus, $\theta \propto P_w / ID$

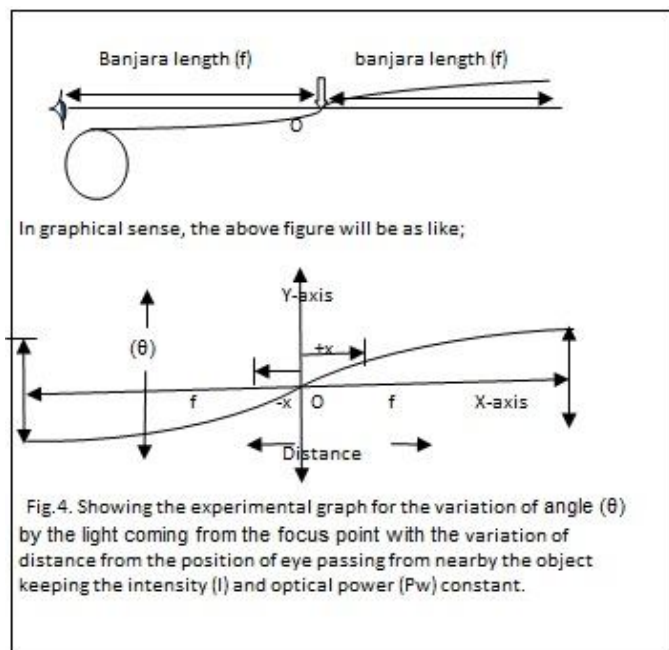
Therefore, $\theta = \frac{BP_w}{ID} \dots (1)$ where, B is any constant (named as Bishal's constant)

2.1 Calculation of Bishal's constant (B):

In the course of experiment, I have found that the shift of image or bending of light from the source occurred in two typical processes keeping optical power (P_w) and intensity (I) of visible light constant, but (D) will itself remains constant for all individual rays of light passing from the object's surface and for all of the rays passing from perpendicular distances $D_1, D_2, D_3 \dots$ and so on, substitution of all these distances give the values of deviations respectively. The bending of light is impossible keeping the source exactly at the end point of banjara length. Here, **banjara length is a distance between eye and the focus point where, the light of any kind don't get bent and it is denoted as 'f'**. But other than this point the bending of light occurs in such two ways that within the banjara length the bending of light take place in one direction but beside it, the bending of light occurs just opposite than the previous one. It simply means within the banjara length the light will deviate in one direction and exactly at the end of the banjara length there we can't see such deviation but out of that length there the deviation will change its direction to just opposite as shown in figure, which is traced theoretically fixing the focus point constant but the object and eye are both shift-able or vice versa. We must note one thing that the banjara length is shift-able depending upon the different power of lens and the intensities of light, we use. When the eye and object both are shifted towards the point 'O' there the value of θ will get vary in its magnitude, it is illustrated below in more approached way.



The following figure will illustrate more clearly:



In accordance of the graph, the value of B is only the factor that's dependent with the value of any distance in between ' f ' from ' O ' in comparison to the banjara length ' f ' and this length is equal to each other from the point ' O ' towards both side of X-axis as the graph is inversely symmetrical to each other as like in figure. Let x be any length from the origin ' O ' either in positive or negative x -axis. So, the numerical value for Bishal constant (B) is obtained as the ratio between the ' x ' and ' f ', i.e. $x:f$. But the question may arise here that for the focus point outside the twice of ' f ' from eye, what will be the case there? So, the solution is that the out of twice ' f ', the value of θ remains unchanged even if there will be variation of distance.

Thus, x needs no increase in its magnitude implying their ratio will be 1 numerically at $x=f$, and it's the maximum value we can get on either side of origin and the minimum value is zero exactly at point ' O ' implying the graph is symmetrical at point ' O ' but in reverse direction. Thus, the RHS portion of above equation '1' will simply be in the form as

$$(x/f)P_w/ID$$

Taking the units of all components of RHS in SI unit s, for e.g. (P_w) as per meter, (I) as lumen per meter square and so on, we will obtained finally the unit of θ as per lumen (lm^{-1}) but the unit of θ is a unit less term so, lets us take another constant that make the both side comfortable naming as Banjara constant (β) whose unit will be in the form of lumen. Thus, the final equation will be

$$\theta = \beta(xP_w)/IDf \dots (2)$$

Such that $B=\beta x/f$, and its unit being per lumen (lm^{-1}) with the unit of θ existing in radian.

3 CONCLUSIONS

So, the above equation '2' is the real equation that can explain the real cause of bending of light on passing through the surface of any kind of object that may be of diverse property in terms of mass, density, size and so on. Emphasizing as **there is no relation between the gravity and photon particles**, if there would, then in performing such experiment with as like above, the deflection must equal to zero as compared to sun like mass with a thin object. Thus, enhancing to think once more for existing laws and principles those are now real be frauds, I mean the current concepts and ideologies of natural sciences. Finally, in short theme of this paper, it certainly changes the entire concept of Relativity, Universe, black hole concept, space-time curvature and many other theories.

REFERENCES:

- [1] Bishal Banjara" Change in the Concept of Equilibriums and Reformulation for Newton's Second Law in Presence and in Absence of Gravitational Field" International Journal of Scientific & Engineering Research, Volume 3, Issue 4, April-2012
- [2] ALBERT EINSTEIN" Relativity" The Special and the General Theory, $E=mc^2$ (1st Edition) MAHAVEER PUBLISHERS
- [3] "Raymond A. Serway, John W. Jewett, Jr. " Physics for scientists and Engineers ,volume-2(6th Edition)
- [4] "Britannica online Encyclopedia"
- [5] "R. MURUGESHAN, Er. KIRUTHIGA SIVAPRASATH" Modern Physics (16th Edition)) S.CHAND AND COMPANY LTD.
- [6] "Answers.com"
- [7] D.S. MATHUR, "Mechanics"(2nd edition) S.CHAND AND COMPANY LTD.

