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Cosmologically Strengthening Hydrogen Atom in Black Hole Universe

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Abstract: With reference to the earlier proposed black hole model of cosmology, the authors proposed a unified model mechanism for understanding the light emission mechanism in cosmologically 'strengthening hydrogen atom'. In this proposed model, characteristic cosmic mass, characteristic nuclear charge radius, Avogadro number and possible quantum states of electron seem to play a major role. Throughout the cosmic evolution, Planck's constant seems to be a constant whereas the currently believed 'reduced Planck's constant' seems to be a cosmological decreasing variable. With this new proposal - Hubble's redshift interpretation, Super novae dimming and currently believed cosmic acceleration can be reviewed at fundamental level and a correct model of cosmology can be confirmed.

Keywords: Cosmic red shift, Black hole cosmology, Possible quantum states of electron, Nuclear charge radius, Avogadro number.

1. INTRODUCTION

The fundamental question to be answered is: During cosmic evolution, right from its birth, is hydrogen atom experiences any structural or physical changes? This question directly and indirectly seems to be linked with the currently believed cosmic redshift observations [9,10]. In this letter the authors reviewed their proposed new cosmic redshift interpretation [22] with reference to Black hole cosmology [23,24]. With this interpretation, from the ground based laboratory hydrogen atom, current cosmic rate of expansion can be continuously monitored. Conceptually if this new interpretation is confirmed to be reasonable, Hubble's law can be relinquished at fundamental level. If so, the advanced concepts of Hubble's law like 'cosmic acceleration', 'dark energy' etc. may fall in a big quandary. The authors are sure that future science, engineering and technology will certainly resolve this sensitive issue.

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2. MOTIVATING CONCEPTS AND POINTS

The authors request the science community to kindly look into the following points in a true scientific spirit.

1) As suggested by S.W. Hawking [18], there is no scientific evidence to Friedmann's second assumption [2].
2) If it is true that galaxy constitutes so many stars, each star constitutes so many hydrogen atoms and light is coming from any excited electron of any galactic star's any hydrogen atom, then considering redshift as an index of 'whole galaxy' receding may not be reasonable.
3) Merely by estimating 'galaxy distance' and without measuring any 'galaxy's actual receding speed', one cannot verify the cosmic acceleration. Note that, in 1947 Hubble himself thought for a new mechanism for understanding the observed red shift [10]. In his words: "We may predict with confidence that the 200 inch will tell us whether the red shifts must be accepted as evidence of a rapidly expanding universe, or attributed to some new principle in nature. Whatever may be the answer, the result may be welcomed as another major contribution to the exploration of the universe".
4) Even though it is very attractive, Einstein could not implement the Mach's principle [5,7] in Hubble-Friedmann-cosmology [9,12,13,17].
5) Until 1964, cosmologists could not believe in 'cosmic back ground temperature' [15].
6) In the past, 'quantum gravity' was in its beginning stage and now it is in an advanced theoretical phase.
7) Based on the Hubble's law and Super novae dimming, currently it is believed that, universe is accelerating [12,17]. In the authors' opinion, if magnitude of past Hubble's constant was higher than the current magnitude then magnitude of past $\left(c/H_t\right)$ will be smaller than the current Hubble length $\left(c/H_0\right)$. So the rate of decrease of Hubble constant can be considered as a true index of rate of increase in Hubble length and thus with reference to Hubble length, the rate of decrease of Hubble constant can be considered as a true index of cosmic rate of expansion.
8) In future, certainly with reference to current Hubble›s constant, $d\left(c/H_0\right)/dt$ gives the true cosmic rate of expansion. Same logic can be applied to cosmic back ground temperature also. Clearly speaking $d\left(T_0\right)/dt$ gives the true cosmic rate of expansion. To understand the ground reality, accuracy of current methods of estimating the magnitudes of (H_0 and T_0) must be improved.

3. REASONS FOR CONSIDERING THE UNIVERSE AS A PRIMORDIAL EVOLVING BLACK HOLE

Even though the subject of black hole physics is very interesting, its back ground mathematics is very complicated and theoretical predictions are beyond the scope of current engineering and technology. So far no single prediction of black hole physics has been evidenced. In 1974 S.W. Hawking suggested that, black holes can have temperature [19]. In 2014, he suggested that black hole event horizons can be assumed to be 'apparent' and needs further investigation at fundamental level [20]. At this juncture, if one starts doubting the 'existence' of black hole event horizons, then whole black hole physics will certainly fall in a 'mathematical' singularity. Until a highly sophisticated satellite reaches a black hole event horizon, strange theoretical concepts like black hole thermal radiation, mass-inflation, black hole's gravitational radiation etc. cannot be addressed clearly and cannot be confirmed.

Now a days most of the cosmologists as well as astrophysicists strongly believe that each and every galaxy of the universe constitutes a fast spinning massive central black hole. Here the authors would like to stress the fact that, if primordial universe is able to produce so many galaxies with so many galactic central black holes that are having almost all closed curvatures, then cosmologists should not ignore the possibility of 'considering the whole universe as a primordial spinning black hole'. In reality - one may reach or may not reach a black hole, if one is willing to consider the whole 'observable universe' as a huge 'primordial evolving and light speed rotating black hole', quantum gravity can certainly acquire a clear physical identity [1,4,21] and many interesting things will come into visualization as proposed in the authors published papers and references therein [23,24]**.**

4. REINTERPRETING COSMIC RED SHIFT

During cosmic evolution, right from the beginning of formation of hydrogen atoms, as any baby hydrogen atom starts growing, cosmologically, bonding strength increases in between proton and electron causing increasing electron excitation energy to emit increased quantum of energy. With reference to the current strengthened or reinforced hydrogen atom, difference in 'emitted quantum of energy' may appear to be the observed cosmological redshift associated with galactic hydrogen atom. Observed Super novae dimming can be understood in this way [17]. Based on this new proposal, 'galaxy receding' concept suggested by Hubble can be reviewed and possibly can be relinquished. If cosmic time is running fast or if cosmic size/boundary is increasing fast or if cosmic temperature is decreasing fast then redshift seems to increase fast with

reference to the current hydrogen atom. For a while guess that cosmological binding strength of proton and electron in the cosmologically evolving hydrogen atom is inversely proportional to the cosmic temperature, then with usual notation, observed cosmic red shift can be expressed as follows.

$$\left(E_{photon}\right)_t \cong \left(\frac{T_0}{T_t}\right)\left\{\left(\frac{e^4 m_e}{32\pi^2\varepsilon_0^2\hbar^2}\right)\left[\frac{1}{n_1^2}-\frac{1}{n_2^2}\right]\right\} \cong \frac{hc}{\lambda_t} \tag{1}$$

where, T_0 represents the current CMBR temperature, T_t represents past cosmic temperature and λ_t is the wavelength of photon 'emitted as well as received' from the galactic hydrogen atom.

At any time in the past, at any galaxy, emitted photon energy can be expressed as follows.

$$\left.\begin{aligned} & E_t \cong \frac{hc}{\lambda_t} \cong \left(\frac{T_0}{T_t}\right)\left(\frac{hc}{\lambda_0}\right) \cong \left(\frac{T_0}{T_t}\right)E_0 \\ & \rightarrow z_0 \cong \frac{\lambda_t-\lambda_0}{\lambda_0} \cong \frac{E_0-E_t}{E_t} \cong \frac{T_t-T_0}{T_0} \\ & \text{and} \quad \frac{E_0}{E_t} \cong \frac{\lambda_t}{\lambda_0} \cong \frac{T_t}{T_0} \cong \left(z_0+1\right) \end{aligned}\right\} \tag{2}$$

Here, z_0 is the current redshift, E_t is the energy of emitted photon from the galactic hydrogen atom and E_0 is the corresponding energy in the laboratory. λ_0 is the λ_t 's corresponding wave length in the laboratory.

From laboratory point of view, above concept can be understood in the following way. After some time in future,

$$z_f \cong \frac{E_f-E_0}{E_0} \cong \frac{E_f}{E_0}-1 \tag{3}$$

Here, E_f is the energy of photon emitted from laboratory hydrogen atom after some time in future. E_0 is the energy of current photon emitted from laboratory hydrogen atom. z_f is the redshift of laboratory hydrogen atom after some time in future. From now onwards, as time passes, in future – $\left|d\left(z_f\right)/dt\right|$ can be considered as an index of the absolute rate of cosmic expansion. Within the scope of experimental accuracy of laboratory hydrogen atoms' redshift, it can be suggested that,

$$\left.\begin{array}{l}\text{Increasing } \left[d\left(z_f\right)/dt\right] \rightarrow \text{Cosmic Acceleration} \\ \text{Constant } \left[d\left(z_f\right)/dt\right] \rightarrow \text{Cosmic Uniform expansion} \\ \text{Decreasing } \left[d\left(z_f\right)/dt\right] \rightarrow \text{Cosmic Deceleration} \\ \left[d\left(z_f\right)/dt\right] = 0 \rightarrow \text{Cosmic halt}\end{array}\right\}$$

5. PHYSICAL PARAMETERS IN BLACK HOLE COSMOLOGY

In the earlier published papers [23,24] the authors suggested that,

1) Universe can be considered as an evolving primordial black hole.
2) Stoney scale [11] can be considered the characteristic beginning scale of the baby primordial black hole universe.
3) Current back ground temperature can be considered as the current temperature of the current primordial black hole universe.

Stoney scale mass-energy scale can be expressed as follows [21,22].

$$\left.\begin{array}{c}\left(M_S\right)^{\pm} \cong \sqrt{\dfrac{e^2}{4\pi\varepsilon_0 G}} \cong 1.859272\times10^{-9} \text{ kg} \\ \text{(OR)} \\ M_S \cong \left(\dfrac{\pi}{xy\sqrt{45}}\right)\sqrt{\dfrac{hc}{G}} \cong 1.824\times10^{-9} \text{ kg}\end{array}\right\} \quad (4)$$

Stoney scale characteristic Hubble radius and Hubble constant can be expressed as follows.

$$\left.\begin{array}{l}R_S \cong \dfrac{2GM_S}{c^2} \cong 2.7613\times10^{-36} \text{ m and} \\ H_S \cong \dfrac{c}{R_S} \cong \dfrac{c^3}{2GM_S} \cong 1.0857\times10^{44} \text{ rad/sec}\end{array}\right\} \quad (5)$$

At any time in the past,

$$R_t \cong \frac{2GM_t}{c^2} \text{ and } M_t \cong \frac{c^3}{2GH_t} \quad (6)$$

For the current state,

$$R_0 \cong \frac{2GM_0}{c^2} \text{ and } M_0 \cong \frac{c^3}{2GH_0} \tag{7}$$

At any time in the past,

$$\left.\begin{aligned} aT_t^4 &\cong \left[1+\ln\left(\frac{H_S}{H_t}\right)\right]^{-2}\left(\frac{3H_t^2c^2}{8\pi G}\right) \text{ and} \\ T_t &\cong \left(\frac{3H_t^2c^2}{8\pi Ga}\right)^{\frac{1}{4}} \Bigg/ \sqrt{1+\ln\left(\frac{H_S}{H_t}\right)} \\ &\text{At the Stoney scale,} \\ aT_S^4 &\cong \left(\frac{3H_S^2c^2}{8\pi G}\right) \cong 8.47\times10^{81} \text{ J/m}^{-3} \text{ and} \\ T_S &\cong \left(\frac{3H_S^2c^2}{8\pi Ga}\right)^{\frac{1}{4}} \cong 2.2371\times10^{32} \text{ K} \end{aligned}\right\} \tag{8}$$

For the current universe, If $H_0 \cong 71$ km/sec/Mpc, $aT_0^4 \cong 4.16\times10^{-14}$ J.m^{-3} and $T_0 \cong 2.723$ K.

At any time, matter density can be expressed as follows.

$$\begin{aligned} \left(\rho_m\right)_t &\cong \sqrt{\left(\frac{3H_t^2}{8\pi G}\right)\left(\frac{aT_t^4}{c^2}\right)} \\ &\cong \left\{1+\ln\left(\frac{H_U}{H_t}\right)\right\}\left(\frac{aT_t^4}{c^2}\right) \cong \left(\frac{3H_t^2}{8\pi G}\right)\Bigg/\left\{1+\ln\left(\frac{H_U}{H_t}\right)\right\} \\ &\text{If } H_0 \cong 71 \text{ km/sec/Mpc, } \left(\rho_m\right)_0 \cong 6.62\times10^{-32} \text{ gram.cm}^{-3} \end{aligned} \tag{9}$$

and can be compared with the matter density of elliptical and spiral galaxies.

6. ROLE OF AVOGADRO NUMBER IN FINAL UNIFICATION

In the early published papers and references therein [25] the authors suggested that, with reference to Schwarzschild interaction that takes place at Black

holes, in atomic system, atomic interaction strength is squared Avogadro number times less than the Schwarzschild interaction. Clearly speaking, atomic interaction strength is equal to inverse of the squared Avogadro number. Alternatively it can be also be suggested that, atomic gravitational constant is squared Avogadro number times the Newtonian gravitational constant.

$$\left(\frac{G_A}{G}\right) \cong N_A^2 \tag{10}$$

where G_A and G represent the atomic gravitational constant and Newtonian gravitational constant respectively. N_A represents the Avogadro number.

7. POSSIBLE NUMBER OF QUANTUM STATES OF ELECTRON IN HYDROGEN ATOM

From modern theory of Hydrogen atom, maximum number of electrons that can be accommodated in any principal quantum shell are $\left(2n^2\right)$ where n=1,2,3,.. Note that, the smallest quantum shell is s-orbital and it constitutes 2 electrons. If one is willing to consider 's-orbital' as a characteristic 'unit shell' of atomic structure, then $\left(n^2\right)$ can be considered as the maximum possible number of unit shells. If each unit shell is guessed to represent a different energy state, then each electron can have $\left(n^2\right)$ possible different quantum states. With this proposal, total energy of electron can be guessed to be inversely proportional to $\left(n^2\right)$.

8. MODEL MECHANISM FOR UNDERSTANDING THE COSMIC RED SHIFT IN HYDROGEN ATOM

In a cosmological approach, starting from the Stoney scale, in this section the authors proposed a simple and ad-hoc model mechanism for understanding the binding energy of electron and proton in the hydrogen atom. It is for further study and development.

In hydrogen atom, in a cosmological approach, potential energy of electron be:

$$\left(E_{\text{pot}}\right)_t \cong -\frac{e^2}{4\pi\varepsilon_0 r_t} \tag{11}$$

where r_t is the cosmologically changing distance between proton and electron.
In hydrogen atom, potential energy of possible $\left(n^2\right)$quantum states be:

$$\left(\in_{\text{pot}}\right)_t \cong -n^2\left(E_{\text{pot}}\right)_t \cong -n^2\left(\frac{e^2}{4\pi\varepsilon_0 r_t}\right) \tag{12}$$

Let the characteristic nuclear radius be half the characteristic nuclear charge radius [3].

$$R_x \cong \frac{1}{2} R_c \cong \frac{1.2 \text{ fm}}{2} \cong 0.6 \text{ fm}. \tag{13}$$

With R_x 'rms charge radius' having mass number A and proton number Z can be fitted as follows.

$$R\left(_{A,Z}\right) \cong \left[Z^{\frac{1}{3}} + (A-Z)^{\frac{1}{3}} \right] R_x \tag{14}$$

Extracted rms charge radius [14] of super heavy nuclide $^{252}_{98}Cf$ is 5.96 fm and its obtained value from above relation is 5.98 fm. Extracted rms charge radius of heavy nuclide $^{184}_{82}Pb$ is 5.37 fm and its obtained value from above relation is 5.41 fm. Extracted rms charge radius of heavy nuclide $^{150}_{70}Yb$ is 4.99 fm and its obtained value from above relation is 5.06 fm. Extracted rms charge radius of light nuclide $^{30}_{12}Mg$ is 3.05 fm and its obtained value from above relation is 2.95 fm. Note that in all these cases data fitting is remarkable.

With this unit radius 0.6 fm, the authors propose the following cosmological semi empirical relation. If one is willing to consider it positively, mystery of quantum gravity and final unification can be explored.

$$\begin{aligned} \left(\in_{\text{pot}}\right)_t &\cong -n^2 \left(\frac{e^2}{4\pi\varepsilon_0 r_t} \right) \\ &\cong -\frac{2}{N_A^2} \left(\frac{M_t}{m_e} \right)^{\frac{1}{2}} \left(\frac{m_p}{m_e} \right)^{\frac{1}{4}} \left(\frac{e^2}{4\pi\varepsilon_0 R_x} \right) \end{aligned} \tag{15}$$

Here in this relation,

$$\left(\frac{M_t}{m_e} \right) \cong \left(\frac{c^3}{2GH_t m_e} \right) \tag{16}$$

can be considered a representation of hypothetical number of electrons that can be present in the universe having a mass $M_t \cong \left(c^3 / 2GH_t \right)$. Another interesting observation is that, for the current state of the universe,

$$2 \left(\frac{M_0}{m_e} \right)^{\frac{1}{2}} \left(\frac{m_p}{m_e} \right)^{\frac{1}{4}} \cong \frac{e^2}{4\pi\varepsilon_0 G m_e^2} \tag{17}$$

Very surprising and heuristic point is that, here in this relation, LHS quantity represents a cosmological variable magnitude and RHS represents a constant magnitude. It is for further study.

Potential energy of electron out of $\left(n^2\right)$ possible quantum states can be:

$$\begin{aligned}\left(E_{\text{pot}}\right)_t &\cong -\frac{e^2}{4\pi\varepsilon_0 r_t} \cong \frac{\left(\in_{\text{pot}}\right)_t}{n^2} \\ &\cong -\frac{2}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x n^2}\right)\end{aligned} \tag{18}$$

Based on the Virial theorem [8], in a central force field, quantitatively potential energy is twice of kinetic energy or kinetic energy is half the potential energy. Following this idea, total kinetic energy of $\left(n^2\right)$ possible quantum states of electron can be:

$$\begin{aligned}\left(\in_{\text{kin}}\right)_t &\cong \frac{1}{2}\left|\left(\in_{\text{pot}}\right)_t\right| \cong \frac{n^2}{2}\left|\left(\frac{e^2}{4\pi\varepsilon_0 r_t}\right)\right| \\ &\cong \frac{1}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x}\right)\end{aligned} \tag{19}$$

Kinetic energy of electron out of $\left(n^2\right)$ possible quantum states can be:

$$\begin{aligned}\left(E_{\text{kin}}\right)_t &\cong \frac{\left(\in_{\text{kin}}\right)_t}{n^2} \cong \frac{1}{2} m_e v_t^2 \\ &\cong \frac{1}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x n^2}\right)\end{aligned} \tag{20}$$

Total energy of (n^2)quantum states of electron can be:

$$\begin{aligned}\left(\in_{\text{tot}}\right)_t &\cong \left(\in_{\text{pot}}\right)_t + \left(\in_{\text{kin}}\right)_t \\ &\cong -\frac{1}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x}\right)\end{aligned} \tag{21}$$

Total energy of electron out of $\left(n^2\right)$ possible quantum states can be:

$$\begin{aligned}\left(E_{\text{tot}}\right)_t &\cong \frac{\left(\in_{\text{tot}}\right)_t}{n^2} \\ &\cong -\frac{1}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x n^2}\right)\end{aligned} \tag{22}$$

Cosmological orbiting radius of electron out of possible n^2 quantum states can be :

$$\begin{aligned}\left(r_n\right)_t &\cong \frac{n^2 N_A^2}{2}\left(\frac{m_e}{M_t}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}} R_x \\ &\cong \frac{n^2 N_A^2}{4}\left(\frac{m_e}{M_t}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}} R_c\end{aligned} \tag{23}$$

Cosmological orbiting velocity of electron out of possible n^2 quantum states can be:

$$\begin{aligned}\left(v_n\right)_t &\cong \sqrt{\frac{2}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x m_e n^2}\right)} \\ &\cong \frac{1}{n}\sqrt{\frac{2}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x m_e}\right)}\end{aligned} \tag{24}$$

Angular momentum of electron out of possible $\left(n^2\right)$ quantum states can be:

$$\left.\begin{aligned}m_e\left(r_n v_n\right)_t &\cong \left(\frac{e^2}{4\pi\varepsilon_0\left(v_n\right)_t}\right) \\ &\cong n\sqrt{N_A^2\left(\frac{m_e}{M_t}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}}\left(\frac{e^2 R_x m_e}{8\pi\varepsilon_0}\right)} \\ &\cong nN_A\sqrt{\left(\frac{m_e}{M_t}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}}\left(\frac{e^2 R_x m_e}{8\pi\varepsilon_0}\right)} \cong n\left(\hbar_t\right)\end{aligned}\right\} \tag{25}$$

For the current state of the universe,

$$\left.\begin{aligned} m_e\left(r_n v_n\right)_0 &\cong \left(\frac{e^2}{4\pi\varepsilon_0\left(v_n\right)_0}\right) \\ &\cong n\sqrt{N_A^2\left(\frac{m_e}{M_0}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}}\left(\frac{e^2 R_x m_e}{8\pi\varepsilon_0}\right)} \\ &\cong nN_A\sqrt{\left(\frac{m_e}{M_0}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}}\left(\frac{e^2 R_x m_e}{8\pi\varepsilon_0}\right)} \cong n\left(\hbar_0\right) \end{aligned}\right\} \quad (26)$$

Here the key point to be noted is that,

$$\hbar_0 \cong N_A\sqrt{\left(\frac{m_e}{M_0}\right)^{\frac{1}{2}}\left(\frac{m_e}{m_p}\right)^{\frac{1}{4}}\left(\frac{e^2 R_x m_e}{8\pi\varepsilon_0}\right)} \quad (27)$$

If $H_0 \cong 71$ km/sec/Mpc, $\hbar_0 \cong 1.0609\times10^{-34}$ J.sec $\cong \hbar$

Here it should be noted that, throughout the cosmic evolution, Planck's constant is a constant where as the currently believed 'reduced Planck's constant' is a cosmological decreasing variable . Considering the jumping nature of electrons, now emitted quantum of energy for one electron can be expressed as follows.

$$\left(E_{\text{photon}}\right)_t \cong \frac{1}{N_A^2}\left(\frac{M_t}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x}\right)\left(\frac{1}{n_1^2}-\frac{1}{n_2^2}\right) \quad (28)$$

For the current laboratory hydrogen atom,

$$\left(E_{\text{photon}}\right)_t \cong \frac{1}{N_A^2}\left(\frac{M_0}{m_e}\right)^{\frac{1}{2}}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x}\right)\left(\frac{1}{n_1^2}-\frac{1}{n_2^2}\right) \quad (29)$$

Clearly speaking, total energy of electron can be:

$$\left(E_{\text{tot}}\right) \propto \frac{1}{N_A^2}\left(\frac{m_p}{m_e}\right)^{\frac{1}{4}}\left(\frac{e^2}{4\pi\varepsilon_0 R_x}\right) \quad (31)$$

This idea is connected with quantum nature.

$$\left(E_{\text{tot}}\right)_t \propto \left(\frac{M_t}{m_e}\right)^{\frac{1}{2}} \tag{32}$$

This idea is connected with final unification of gravity and atomic interactions.

$$\left(E_{\text{tot}}\right)_t \propto \left(\frac{M_t}{m_e}\right)^{\frac{1}{2}} \tag{33}$$

This idea is connected with cosmic evolution and changing cosmic back ground.

DISCUSSION AND CONCLUSION

It may be noted that, on 17 March 2014 it was announced that the BICEP and Keck Array/BICEP2 instrument had detected the first type of B-modes, consistent with inflation and gravitational waves. Had this been confirmed it would have provided strong evidence of cosmic inflation and the Big Bang, but on 19 June 2014, considerably lowered confidence in confirming the findings was reported and on 19 September 2014 new results of the Planck spacecraft reported that the results of BICEP2 can be fully attributed to "cosmic dust" rather than "gravitational waves". In this context, Planck astronomer Jean-Loup Puget of the University of Paris-Sud says, that "unfortunately, we have not been able to confirm that the signal is an imprint of cosmic inflation" [16].

The authors would like to stress the fact that, until one finds solid applications of super luminal speeds and super luminal expansions in other areas of physics like astrophysics and nuclear astrophysics, currently believed 'cosmic inflation' cannot be considered as a real physical model and alternative proposals of inflation can be given a chance in exploring the evolving history of the universe.

In this brief report, in a cosmological approach the authors proposed a new interpretation for the observed galactic redshift. By considering this new cosmic redshift interpretation a novel model of cosmology can be developed. It can be suggested that,

1) In Hydrogen atom, in n^{th} principal quantum shell, electron can exist in (n^2) different states.

2) Characteristic nuclear charge radius play a vital role in the past and current hydrogen atoms' light emission mechanism.
3) From the beginning of formation of hydrogen atom, Avogadro number plays a vital role in laboratory hydrogen atoms' light emission mechanism.
4) Characteristic mass of the evolving black hole universe plays a vital role in laboratory hydrogen atoms' light emission mechanism.
5) 'Galaxy receding' concept suggested by Hubble can be reviewed at fundamental level and possibly 'Hubble's law' and its dependent 'cosmic acceleration' concepts can be relinquished.

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