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'Development of Lunar Mass-Energy Equation to Study Dynamics of Lunar Environment to Explore Life on Moon through the Detoxification of Lunar Toxins'.

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Abstract

Sun is hot with core temperature of 6000 degrees C) & Moon is Cold with temperature of (-233 Celsius), at night, (123 Celsius) during the day. Because the Moon has no atmosphere to block some of the Sun's rays or to help trap heat at night. Apparently, if Solar energy is for warming then Lunar Energy should contribute to cooling. The efforts are to draw plausible correlations of Lunar Energy and its dynamics with the few parameters e. g Lunar temperature (Lt), Lunar phases (L p), Lunar angles (La) i.e degrees away from the Sun to evolve 'GEL (Goswami-Einstein-Lunar Mass-Energy) Equation' and develop 'Lunar Atmospheric Models (LAM)' Since, the Estimated Composition (particles per cubic cm) of the tenuous lunar atmosphere contains Toxic Gases viz. Methane (CH4) – 1000 & Carbon Dioxide (CO2) apart from non-toxic gases viz. Trace Oxygen (O+), Hydrogen (H2) - 35,000, Ammonia – 1000 and the inert gases along with Possible Phosphorus (P+), Sodium (Na+), Magnesium (Mg+). Hence ,the escape of Lunar Gases through Detoxification of Lunar Toxic Gases (LTG) would help to explore life on the Moon by making its atmosphere more livable by enhancing the Oxygen content, diminishing Methane, Carbon dioxide, controlling 'Day Lunar Warming(DLW) 'Night Lunar Cooling(NLC)& harnessing Lunar, Solar, Planetary energy, to create water & minerals through catalytic chemical processes. Further, warming of climate due to "Green House" effect of increase in Carbon-dioxide and Methane can be lessened through innovative Lunar Lasers Technology (LLT), Lunar-lasers, Lunar Panels (LP), Lunar Cooling Towers, Lunar Storage Batteries (LSB) by making use of Magnetic Refrigeration Techniques (MRT)& detoxification of Lunar toxins by innovative technologies. It aims to use Lunar Missions (LRO & 'CHADRAYAN-2/3') data; to evolve Lunar Science by studying Energetic of Lunar-Environment, Lunar Radiation, Lunar dust grains, Lunar exosphere, Lunar-ionosphere, Lunar's reaction to severe solar storms and human activities through (Goswami -Einstein -Lunar –Mass-Energy Equation) & 'Lunar Atmospheric Models (LAM), to get Moon inhabited. To find out how do the highly variable energy& matter in the inner heliosphere affects the volatile stability, exosphere, plasma interactions, dust-migration, surface micro-structures and human systems at the Moon, and how it will change with human presence by developing neutral-plasma-dust models. To explore life through plantation in the Lunar Soil using Plant Catalysts e.g. Piri Formo Sopra Indica (PFSI), ROOTONIC (mycorrhizal- multi functional fungus) and grow plants: Bryophytes, Pteridophytes, Gymnosperms for future Manned-Moon-Mission. To find formation of O3 in the atmosphere due to the series of complex photo chemical reactions energized by Moonlight and REDOX (Reduction-Oxidation to convert available Lunar Non-Toxic Gases (LNG) to plausible Oxygen & Water. The results of these investigations may be used for future Mars planet & other planetary systems to explore the possibility of life.

Keywords: 'Lunar Atmospheric Models (LAM)', REDOX (Reduction-Oxidation), Lunar Non-Toxic Gases (LNG), Plant Catalysts e.g. Piri Formo Sopra Indica (PFSI), ROOTONIC (mycorrhizal- multi functional fungus), Lunar Lasers Technology (LLT), Lunar-lasers, Lunar Panels (LP), Lunar Cooling Towers, Lunar Storage Batteries (LSB) by making use of Magnetic Refrigeration Techniques (MRT), 'GEL (Goswami-Einstein-Lunar mass-Energy) Equation'

1. Introduction & Relevance to Previous Work

Atmospheres exist in the entire Solar system, including the Sun and Earth, the terrestrial planets, the outer planets, several planetary moons, and comets. The loss of these atmospheres includes the escape of both neutral gas as well as ionized particles. The Sun, atmospheric loss creates the supersonic solar wind and the smaller bodies, e.g. planetary moons, and comets resulting in an atmospheric outflow on the celestial object's magnetosphere. Since, Moon is Earth's natural satellite with no weather or Atmosphere eroding its surface hence, it makes the Moon an attractive target for science missions & human exploration.

Space usually is said to begin about 100 miles above the earth. The space between the Earth and Moon is called Cislunar space (cis means on this side and lunar means of the Moon. As the Moon approaches through cislunar space, Earth's gravity becomes weaker, and moon's gravity becomes stronger. The combined gravities of the Earth and Moon are effective to about a million miles from the earth. Space to this distance is sometimes called trans lunar space. Space between the planets is called interplanetary space. The Cis -lunar space=10,000 miles. Moon = 100,000 miles & Trans lunar space= 1000,000 miles. The Interplanetary space between Earth and the planets like Venus, Mars & Mercury lies between 10,000,000 to 100,000,000 miles or so.

The moon is about quarter of earth's size. Temperatures on the Moon are both hotter and colder than those on Earth. In other words, the temperature range is more extreme. There seems to be correlation of the Earth processes with the processes on the Moon, and both are interlinked with gravitational forces and tidal interactions. The tidal forces slowed down the earth's spin (from about 5- 24hour period), and these lunar tides brought marine life from seas to land which slowly evolved into land-species. Apollo's Earth-Moon distance measurements revealed that Moon is drifting away from the Earth by 3-4 cm every year. The orbital movement of the Moon around the Earth stabilizes the wobble of the Earth's orbit resulting the equitable climate inhibiting the extreme temperature diurnal variations. The Moon is geologically quiet and dormant. ISRO's polar Lunar orbiter mission (Chandrayaan-1), 2008-2009, studied Moon's environment and surface processes and inferred that the Moon has got a tenuous but active hydrosphere, volcanically active and geologically dynamic Moon with Global melting of Moon's surface regions and formation of magma oceans. H, OH, H2O, CO2, Ar etc. along with several young (~2 to100 Ma) volcanic regions were identified in the lunar atmosphere. Also, X-ray Spectrometer data showed anorthosite terrain with composition, high in Al, poor in Ca and low in Mg, Fe and Ti in a nearside southern highland region. The mass spectra studies identified the presence of H2O, and increased concentration of H2O /CO2 towards the lunar surface, with decreasing altitude, approaching towards the Lunar's South Pole. The US-LRO Mission analysed the material ejected as a plume from an artificial crater created by impacting a ~2.5ton object (a burnt-out engine) in Cabe us Crater near the South Pole of the Moon, and found CH4, C2H6, CH3OH, CO2, NH3, H2S, OH, CO2 etc. besides Water. Feldman et al. detected water in lunar polar regions based on the fluxes of fast and epithermal neutrons, measured by neutron detector board Lunar Prospector. They also estimated that the amount of water/ ice, buried or mixed with soil, could be billions of tons, at each of the north and south poles of the Moon. Water-ice is normally expected to reside at the crater base inside the permanently shadowed craters. The water deposited at the poles is a mixture of three types of water viz. exogenous (impact), endogenous (degassing, volcanic) and water produced by reduction of lunar oxides by solar wind protons. In the upper layers of the Moon, the large number of secondary charged particles, neutrons, gamma rays produced by the decay of radioactive elements (Uranium, Thorium, Potassium), and galactic cosmic ray interactions, were identified. Also, in the Lunar environment, Lunar atmosphere-hydrosphere-surface exchange processes are taking place and lunar radiations, sunlight, solar wind, solar flares, galactic cosmic rays, X rays and proton induced X rays are present (Fig.1). The Chandrayaan-1 X ray Spectrometer (C1XS) measured chemical composition (Mg, Al, Si, Ca, Ti and Fe) of highland rocks in the nearside southern hemisphere of the Moon, near Tycho.

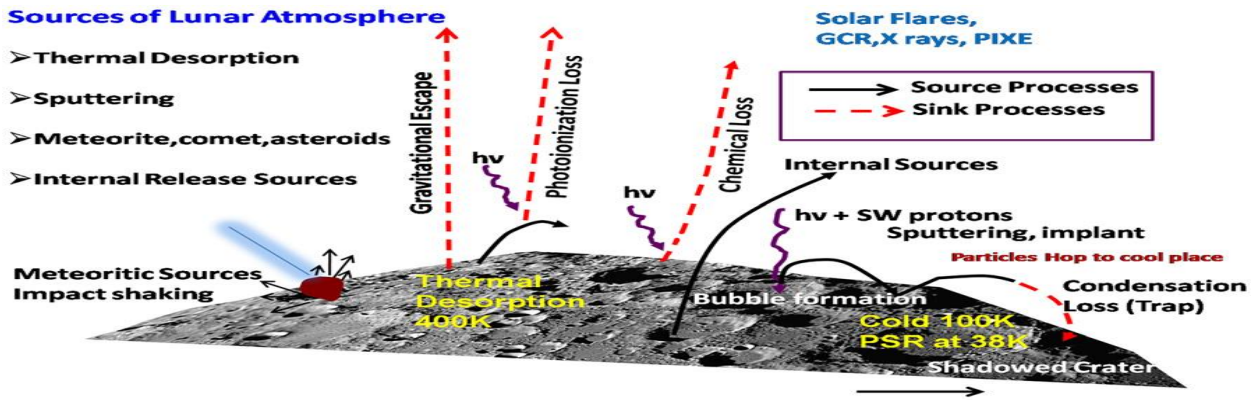

Figure 1: Lunar Atmosphere-Hydrosphere-Surface Exchange Processes are Schematically shown. the Radiation Present in the Lunar Environment, Besides Sunlight, Consists of solar wind, solar Flares, Galactic Cosmic Rays, x rays and [Roton Induced x Rays.

1.1.The Lunar Atmosphere

consists of Lunar dust, the regolith particles ranging in size from tens of nano meters to microns. Lunar dust results due to complex interaction of the Lunar soil with multiple mechanical, electrical, and gravitational effects. It affects the environmental and anthropogenic factors as well as risk for toxicological health problems if inhaled., and hence, the perturbation, transport, and deposition of Lunar dust must be studied to mitigate its potentially harmful effects on exploration systems. The results of investigations carried by NASA's Scientists Dr Abbas et.al ; at Marshall Space Flight Centre , may be collaborated to study the magnetic properties of Lunar sediments, Lunar soil , charging and levitation of dust grains in the Lunar regolith along with its physical and optical properties by using Electro Dynamic Balance (EDB.) Further, in order reduce the Lunar day time temperature; an innovative Lunar Carbon Sequestration Techniques (LST) may be developed by making use of 'ISRO-Chadrayan-2/3'/NASA Payloads data to capture the Carbon dioxide present in the Moon, by adding the evolutionary Lunar 's aerosols (La) e.g. Sodium aerosols (caused by Moon quake). Lunar Carbon dioxide (LCO2) can also be mitigated by chemical reaction of Lunar Hydrogen to produce methanol as a liquid alternative transportation fuel for Lunar Cars to run on the Lunar surface in future Manned –Lunar-Mission.

The chemical and isotopic analyses Of the Moon samples and its orbital peculiarities revealed that Moon might have formed from the material ejected from the Earth by impact of a large (0.1 ME) asteroid ("Giant impact hypothesis"). The absorption capacity of O3 per mole is approximately 2000 times that of CO2. Although, the stratospheric O3 is 90% in relation to the 10% in the ozone troposphere. The estimation shows that a 50% increase in the tropospheric Ozone would increase the global surface temperature by 0.3 o C. The change in the O3 distribution may cause an alteration in the amount of Solar ultraviolet radiation, atmospheric circulation and weather. The Structure of Lunar Atmosphere (LA) yet to be explored to find out about its different layers and the other Lunar Gases (e. g Lunar Ozone if any) responsible for the increase of daytime Lunar Surface Temperature(LST)? Also, what are those series of complex photo-chemical reactions energized by Moonlight resulting in the formation of Lunar Gases (e. g Lunar Ozone if any) in the Lunar Atmosphere (LA). As having searched in the Google Search Engine, hardly any study is found on Lunar Energy, Lunar-Photons('Luton's'), Lunar Spectra, Lunar aerosols, Lunar Panels, Lunar-Mass-Energy-Equation'(LME)'Lunar Atmospheric Models (LAM),harnessing of Lunar Energy and its application in Control of Global Warming and climate variability. No elaborate study could be traced on Lunar Radiations, Lunar Cells, Lunar Lasers, Lunar Cooling Towers, Lunar Air conditioning, Lunar Refrigeration, Control of Day Lunar Warming (DLW) & Night Lunar Cooling (NLC) through chemical processes to get Moon planet inhabited. However, there is a passing reference in the Wikipedia about "Project Apollo-1970", wherein, there is a mention of how the Lunar energy work with a mention of possibility to create photovoltaic cells and be placed on the Moon to transmit enormous amounts of energy to Earth.

Dr. David Criswell from the University of Houston found that all the materials required in making up photovoltaic cells were present in the moon's dust and rocks. In other words, 'Lunar Science' research is not so common as compared to Solar research. Hence, I firmly believe in exploring the same by making use of Lunar Missions e.g. LRO & CHADRAYAN-2/3' Payloads.

Similarly, the Lunar Spectra of Lunar Radiations yet to be studied by making use of 'ISRO-CHADRAYAN-2/3' NASA payloads to explore the different spectral regions if any , i. e Lunar Ultraviolet(LUV) & Lunar Infrared (LIV) along with Lunar Visible (LV) alike Solar Spectra to determine the change in the Lunar Gasses (LG) distribution causing an alteration in the amount of Lunar Ultraviolet (LUV)/Lunar infrared (LIR) radiations, Lunar Atmospheric circulation and Weather.

1.2. Next, Lunar Cooling i.e. Harnessing of Lunar energy & Lunar Cooling:" Lunar-AC":Dr. VK Goswami

Lunar Cooling may be an alternative to replace CFC in Refrigeration and Air conditioning if, one is able to harness Lunar energy. Based on Krishna raj Studies (HT:20 Sep'15), I'm of the view that Lunar Energy can be harnessed and used for Cooling, and production of Lunar Ac and refrigeration as well. Lunar Cooling can be generated by either harnessing the Lunar energy through Lunar Panels like Solar panels or developing the Lunar - Concentrator by using a parabolic trough-like machine, perhaps complete with methanol and activated Carbon attached on the top. Probably, this proposed system of Lunar -Concentrator comprising methanol and activated Carbon should minimize Green House effect, thereby increasing the Cooling process. Hence, in my view, the Detoxification of Lunar Toxic Gases (LTG) would help to explore life on the Moon by making its tenuous atmosphere more livable by enhancing the Oxygen content, diminishing Methane, Carbon dioxide and creating water & minerals through catalytic chemical processes. Also, the mitigation of Lunar Methane (L-CH4) to Lunar ethanol/Lunar Methanol by means of Catalytic Process should be useful for the development of Lunar-Cells (LC) to harness Lunar Energy (LE).

The Moon is the largest planetary satellite orbiting Earth. with Gravity: 1.62 m/s², Escape velocity: 2.38 km/s, and Age: 4.53 billion years. The moon is a sphere (Radius: 1,737.1 km), and it takes 27 days (orbital period) to rotate on its axis and in 27.3 days to travel once around Earth, showing always the same face without single "dark side" of the moon. As the moon revolves around Earth, it is illuminated from varying angles by the reflected sunlight (from the Earth). On average, the moon rises about 50 minutes later each day i.e. sometimes it rises during daylight and other times at night. With 12 lunations, a Lunar year is 354 days, 8 hours, 48 minutes, 34 seconds (354.367056 days) compared to a Solar year is 365 days, 5 hours, 48 minutes and 46 seconds. Since the moon does not orbit our planet in a perfect circle, at times the full moon coincides with the satellite's closest approach to

our planet, i.e. it reaches perigee(closest point to Earth). At the time of Perigee, the moon is 223,980 miles (360,461 kilometers) from Earth, and at Apogee (the farthest away it gets the moon) is 252,088 miles (405,696 km) from Earth, compared to its average distance of 240,000 miles (384,400 km).

2. Objective of the Project

As the increase of temperature of the earth surface has got direct relation with the rise of concentration of various Green House Gases e.g. Carbon- dioxide, and Methane, resulting major changes in the various climate parameter, so in the same way, the available Lunar Carbon- dioxide and Lunar Methane should also be responsible for Lunar High Temperature (LHT) during the day and may affect the Lunar Climate Parameters(LCP).Hence, it's imperative to study these LCP for future human living on the Moon.

Since there is remarkable diurnal variation in the Lunar Surface Temperature, hence the variation in intensity of Incident Lunar Radiation Energy (ILRE) on the Earth should depend on the Lunar temperature (Lt) of day & Night. The higher the temperature, the more intense the Lunar Radiation. Therefore, Incident Lunar Radiation Intensity or simply Lunar Radiation Intensity (LRI) should be proportional to Lunar temperature (Lt). If that is the case, then the cooling of the Lunar surface is also due to absorption of ILRE or dependent on Lunar Radiation Intensity (LRI) depending upon Lunar temperature (Lt).

Mathematically,
<(LRI) □ (Lt) > Eqn. (1) say: Lunar Rad. Int. Eqn.<LRIT-Eqn.>.

The Moon-sphere orbits the Earth-sphere, and it gets illuminated with the Sun's light radiation resulting in changes in its appearance e.g. full & bright, silver of silvery light. These changes in appearance (the moon's disk illumination), are the Phases of the Moon and they vary; when the Moon travels around the Earth at different Lunar angles (La) i.e. degrees away from the Sun. In New Moon (Moon is between Earth and the Sun appears dim). In the First Quarter, (the Moon is 90 degrees away from the Sun) and is half-illuminated. During Full Moon (the Moon is 180 degrees away from the Sun) and is fully illuminated by the Sun. In the Last Quarter, the Moon moves to the third quarter position and Sun's light is now shining on the other half of the visible face of the Mo on.

Lunar eclipse: Sun-Moon-Earth (SEM) & Solar eclipse: Earth-Moon-Sun (EMS)
Therefore, Lunar-Shine is proportional to Lunar phases (L p) vis-à-vis Lunar angle (La) i.e. Lunar-shine (Ls) is proportional to Lunar angles (La) i. e degrees away from the Sun. Mathematically, < (Ls) ∝ (La)>… Eqn. (2) say. i.e. Lunar-shine Eqn.<Ls-Eqn.>.

Combining the Equations (1) & (2),

< (LRI) ∝ (La). (Lt)>…Eqn. (3) say. i.e. Lunar Radiation Intensity (LRI-Eqn.>

The Lunar radiation intensity is just a measure of Lunar shine (Ls), which can be measured by developing Lunar- Shine- Recorder (LSR) at par with Sun-Shine-Recorder (SSR). Hence, Eqn. (3) reduces to,

(Ls) ∝ (La). (Lt)>…Eqn. (4) say. Lunar-Energy Eqn. <LE-Eqn.>

Since the Lunar shine seems to be the result of Lunar- photons or acronym as 'Luton', hence can be treated nothing less than Lunar-Energy (LE).

Therefore the (Ls) ∝ (La). (Lt)>…Eqn. (4) is simply Lunar-Energy (LE)Eqn.

* The efforts have been made to draw plausible correlations of Lunar energy with the few parameters viz. Lunar temperature (Lt), Lunar phases (L p)/ Lunar angles (La) i.e. degrees away from the Sun etc. resulting GEL (Goswami Einstein Lunar mass-energy) Eqn. showing, equivalence between Lunar energy and Lunar mass & the possibility of releasing large on conversion of mass.

* Next, to use Lunar Missions e.g. LRO & 'CHADRAYAN-2/3' data; to evolve Lunar Science by studying Energetic of Lunar-Environment, Lunar Radiation, Lunar Energy , Lunar dust grains , interstellar dust grains , Lunar exosphere, Lunar-ionosphere, Lunar's reaction to severe solar storms and human activities through 'GEL (Goswami -Einstein -Lunar –Mass-Energy Equation)' and 'Lunar Atmospheric Models (LAM)', in order to get Moon planet inhabited .

*Also, to find out how do the highly variable energy and matter in the inner heliosphere affect volatile stability, exosphere formation, plasma interactions, dust migration, surface micro-structures and human systems on the Moon how will it change with human presence by developing neutral-plasma-dust models.

* Next, to study the Physicochemical Characteristics of Lunar's Atmosphere and detoxification of Lunar Toxic Gases (LTG), through Chemical analysis of the Lunar soil and making use of the data collected by Lunar Missions e.g. LRO & CHADRAYAN-2/3' Payloads viz. Lunar Atmosphere and Dust Explorer Mission (LADEE), the LIDAR comprising of TEA (Transversely Excited Atmospheric pressure) CO2 – LIDAR. The (LADEE) is an impact ionization instrument, at an impact speed of > 1.6 km/s, capable of mapping the variability of the density and size distributions of dust in lunar vicinity. .

* To investigate is there any formation of O3 in the atmosphere due to the series of complex photochemical reactions energized by Moonlight, Lunar-Spectra, and its meridian variations. Also, to investigate the Chemical reactions e.g. REDOX (Reduction-Oxidation), responsible to covert Lunar toxins to Lunar non-toxins/ Lunar non-toxic gases to search Water and O2. .

* Next, to explore the possibility of life through plantation in the Lunar Soil; using Plant Catalysts e.g. Piri- Formo- Sopra-Indica

(PFSI),ROOTONIC (mycorrhizal multi-functional fungus) to grow plants of Bryophytes, Pteridophytes, Gymnosperms and Angiosperms(both mono-dicots) family, for the future Manned-Moon-Missions(MMM). These (PFSI) plants work on extreme climatic conditions (+40 deg. Celsius in deserts of Rajasthan & -30 deg. Celsius in Leh soil, India), may be used to control diurnal variation of temperature on the Lunar Surface.

3. Lunar Equations Computation

(a) Computation of 'Lunar-Mass-Energy Equation'(LME) based on 'Einstein mass energy equation':

<E = mc2 >, equation is Albert Einstein 's Theory of Special Relativity , expressing that mass and energy are the same physical entity and can be changed into each other.The equation states that, the increased relativistic mass (m) of a body times the speed of light squared (c2) is equal to the kinetic energy (E) of that body, and mass and energy are no longer conserved but can be inter-converted. In this equation, velocity of light(c) , serves as a constant of proportionality. Presently, (LME) is a hypothetical equation based on' Einstein mass energy equation', <E=mc2>, and acronym as 'Goswami Einstein Lunar mass energy equation'<'GEL' Eqn.>; has been conceived by me, needs mathematical computation and to be proved experimentally by making use of 'CHANDRAYAN -2/3 & NASA Payloads data. Assume LE = Lunar Energy content, lm = mass of moon, lc =Lunar radiation velocity, then 'Einstein mass energy equation' can be written as:

<LE = lm.lc2>….. (5) Eqn. say. <'GEL' Eqn.>;

Through this (5)Eqn. it may be put , that the ' mass of moon' is perhaps a measure of Lunar energy content (LE) and that when the energy of the Moon is changed by an amount of (LE) , no matter what form the energy takes, the mass of the moon (l m) will change in the same sense (due to part conversion into energy); by < LE / lc2>, since velocity of Lunar radiation (lc) is constant i.e. does not change. Consequently, this general relationship of <LE = lm.lc2> may be referred to as Goswami Einstein Lunar -Mass-Energy Equation' or 'GEL' Eqn.

It shows that when velocity of Lunar radiation (lc) is constant, then there is an exact equivalence between Lunar energy (LE) and Lunar mass(l m) with a possibility of releasing large Lunar energy by the conversion of Lunar mass (l m).

Well, this conversion of Lunar mass is feasible as the past studies of Apollo's Earth-Moon distance measurements & ISRO's Çhandrayan-1' have shown that there is a correlation of the Earth processes with the processes on the Moon and both are interlinked with gravitational forces as well as Moon is drifting away from the Earth by 3-4 cm every year. It means the distance between the Moon and the Earth is changing by 3-4 cm every year, along with the changes in gravitational forces between the Moon & the Earth.

The famous Newton's Universal Law of Gravitation, states that Gravitational Force (F) between two planetary bodies is directly related to product of their masses of the bodies and inversely related to/ (divided by) the square of the distance between their centres of mas. If, mass of the Earth is (m) & of the Moon is (m') and the distance between the two is (d), then, <F=G (mm'/d2) > (6) Eqn. say. Where is G Gravitation Constant. G. was experimentally determined by Henry Cavendish in the 18th century to be the extremely small force of 6.67 x 10-11 Newtons. Simply, from <F=G (mm'/d2) > one can compute mass of the moon (m') to correlate the changes in its mass due to 3-4 CMS of the Moon drifting away from the Earth.

i.e. < m'= (F x d2)/ m > (7) Eqn.

This Change is mass would result the conversion of mass into energy as this is going to result into changed mass of the moon (m'). If this changed mass (i.e. new mass) of the Moon is denoted as (m"), then it can be calculated from Einstein Equation, i.e. <E=mc2>.

In other words, the Change in Lunar Energy due to annual drifting of the Moon away from the Earth (3-4cms) can be computed by the modified Goswami-Einstein Eqn.

<E=(m").c2>……..(8)Eqn. say.

Substituting this Eqn. (8) into (5) Eqn. we get,
<LE = (l m") .lc2> …..(9) Eqn. say, <GEL-EQN.>,

where, (l m") is changed mass (i.e. new mass) of the Moon & velocity of Lunar radiation (lc) is constant i.e. does not change.

Eqn. (9) is Goswami-Einstein-Lunar Mass-Energy Equation<GE-LME)/GEL-EQN>.

3.1.Application of <'GEL'-Eqn.> in Computation of Correlation of Lunar mass, Lunar shine & Lunar phases (Lunar angle)

As the annual drifting of the Moon away from the Earth (3-4cms), is related with the Change in Lunar Energy (LE) vis-à-vis new Lunar mass (l m") vide (9)Eqn. hence, the Moon's annual drifting should depend on Lunar angles (La) i.e. degrees away from the Sun. i.e. < (l m") ∝ (la) > …(10)Eqn. say.

Also, < (ls) ∝ (la)> Eqn. (2), Hence, .< (l m") □ (la). (ls) >…… (11)Eqn. say.

Since the Velocity of the Lunar radiation (c) is constant, then Eqn. (11). can be written as: < (l m") = (la. ls)/ lc2> ….Eqn.(12)say.

Substituting into Eqn. (5), the 'GEL'-Eqn. reduces to: <LE = (la. ls) / lc2> (12) Eqn.
where, (lc) Const. It means Lunar energy would depend on phase of the Moon (L p) i.e. Lunar angle (La) i.e. degrees away from the Sun, and the intensity of Lunar radiation i.e. Lunar shine (Ls).

3.2. Goswami-Einstein's Theory of Lunar Relativity (GET-LR)

Albert Einstein 's Theory of Special Relativity is mathematically represented by <E = mc2 >, equation, expressing that mass and energy are the same physical entity and can be changed into each other. Next, Çhandrayan-1' have shown that there is a correlation of the Earth processes with the processes on the Moon and both are interlinked with gravitational forces as well as Moon is drifting away from the Earth by 3-4 cm every year. It means the distance between the Moon and the Earth is changing by 3-4 cm every year, along with the changes in gravitational forces between Moon & Earth in the cis-Lunar space and this has been computed by applying Newton's Universal Law of Gravitation. (Eqn.8). If this changed mass (i.e. new mass) of the Moon is denoted as (m"), then it can be calculated by <E=mc2>, representing Einstein's Theory of Special Relativity. In other words, the Change in Lunar Energy due to annual drifting of the Moon away from the Earth (3-4cms) can be computed by the modified Goswami-Einstein Eqn.

<E=(m").c2>……..(8)Eqn. say. and be termed as Goswami-Einstein's Theory of Lunar Relativity (GET-LR), because this equation would be able not only to cater the changes in Lunar Energy due to annual drifting of the Moon away from the Earth (3-4cms) along with the changes in gravitational forces between Moon & Earth in the cis-Lunar space, but, also to explain well Lunar atmosphere-hydrosphere-surface exchange processes.

Also, Goswami-Einstein's Theory of Lunar Relativity (GET-LR), would be able to interpret and prove experimentally, (based on the basic Einstein's Theory of Special Relativity),Goswami-Einstein-Lunar Mass-Energy Equation<GE-LME)/GEL-EQN>.

,<LE = (l m") .lc2> (9) Eqn. say, <GEL-EQN.>, where (l m") is changed mass (i.e. new mass) of the Moon & velocity of Lunar radiation (lc) is constant i.e. does not change.
With due apology and utmost humility, I may put that the present Einstein's Theory of Special Relativity may not be able to accommodate the new mass of moon (m"), due to annual drifting of the Moon away from the Earth (3-4cms) in the <E = mc2 >, eqn.

3.3. Goswami-Newton's Law of Lunar Gravitation (GN-LLG)

It's an established fact that as the Moon is approached through cislunar space, Earth's gravity becomes weaker, and moon's gravity becomes stronger. The combined gravities of the Earth and Moon are effective to about a million miles from the earth. Space to this distance is called trans lunar space. Since the Moon does not orbit our planet in a perfect circle, at times the full moon coincides with the satellite's closest approach to our planet, i.e.it reaches Perigee (closest point to Earth). For example, the Warm Moon (the full Moon of March), arrived on Monday at 1:48 p.m. EDT (1748 GMT), and it reached perigee, its closest point to Earth, today (March 10) at 2:33 a.m. EDT (0633 GMT), nearly 13 hours later. At the time of Perigee, the moon is 223,980 miles (360,461 kilometers) from Earth, and at Apogee (the farthest away it gets the moon) is 252,088 miles (405,696 km) from Earth, compared to its average distance of 240,000 miles (384,400 km). (C.f.Space.com,11Mar'20) If that is the case, then at the time of Perigee, the Moon, the Lunar Gravitational Force, or Lunar Force of Gravitation (LFG) should be different than that of its average distance and that of the farthest distance (Apogee) of the Moon from our planet Earth.

All these three Perigee, Apogee, and Average Lunar Force of Gravitation (LFG)'s, can be computed by the famous Newton's Universal Law of Gravitation <F=G (mm'/d2) >…… (6) Eqn. ,where (m) is the mass of the Earth and (m') is the Mass of the Moon & (d) is the inter-planetary distance between Earth & Moon, measured from centre of mass.G is Gravitation Constant and extremely small force of (6.67 x 10-11) Newtons.

Next, Çhandrayan-1' have shown that there is a correlation of the Earth processes with the processes on the Moon and both are interlinked with gravitational forces as well as Moon is drifting away from the Earth by 3-4 cm every year. This change of distance due to Moon drifting away from Earth would result Change in mass of Moon (m'), and create a new mass (m'') say, due to conversion and as per proposed Goswami-Einstein's Theory of Lunar Relativity (GET-LR)'i.e. this changed mass (i.e. new mass) of the Moon, denoted as (m"), can be computed by the Change in Lunar Energy due to annual drifting of the Moon away from the Earth (3-4cms) by the modified Goswami-Einstein Eqn. <E=(m"). c2>……..(8) Eqn.
as well as by modifying the <F=G (mm'/d2) > into

<F=G (mm''/d2) > …Eqn. (13) say.

Further, one can compute the new mass of the moon (m") to correlate the changes in its mass due to 3-4 cm of the Moon drifting away from the Earth. i.e. < m= (F x d2)/ m > (14) Eqn. This <F=G (mm''/d2)> …. Eqn. (13), may be termed as Goswami-Newton's Law of Lunar Gravitation < (GN-LLG) Average>, From Eqn. (13) one may easily derive the balanced two proposed Perigee, Apogee, Lunar Force of Gravitation (LFG) -Eqns. Since this Eqn. (13) pertains to the
Average -LFG.<F=G (mm''/d2) > ….Eqn.(14), < (GN-LLG) Perigee>
& <F=G (mm''/d2)> ….Eqn.(15), < (GN-LLG) Apogee>.

3.4.Computational Correlation of 'GEL- Eqn. with Goswami-Einstein's Theory of Lunar Relativity (GET-LR): This may be computed by considering the Change in Lunar Energy due to annual drifting of the Moon away from the Earth (3-4cms), and by the modified

<LE = (lm") .lc2>… (9) Eqn. & Goswami-Newton's Law of Lunar Gravitation (Average),
<m" = (F x d2)/ m > (14) Eqn.

Now, if 3.5 cm is an average Moon drifting in a year(365 days/354 Lunar days),then though there is hardly any Moon drift in a day, but even this fractional change in planetary distance between

Moon and Earth will make change in the mass of Moon (m'),when substituted into < m"= (F x d2)/ m >(14) Eqn. to calculate the new mass of Moon (m") due to its conversion into energy has been resulted because of annual Moon-drift (3.5cm), and subsequently is available to calculate the Lunar Energy(LE) by the modified 'GEL-Eqn.': <LE = (l m") .lc2>. (9) Eqn.

The change in Lunar mass (dl m') would be that available mass of the Moon which shall get converted as per 'GEL-Eqn..(9)-i.e. <(dl m')=(l m'-l m")>….(16)Eqn.

Then, Eqn. (9), GEL-Eqn.' becomes, <LE = (dl m') .lc2>…(.17) Eqn.
It would enable us to calculate the Lunar Energy available to Harness, and It can be acronym as Lunar-harnessing-Energy (L h E).

3.5. Research Methodology & Applications of 'GEL' Eqn

(a) Inter conversion of Lunar Mass & Lunar energy:

The mass of the moon= (1024 kg) & assuming, that lc =Lunar radiation velocity is the same as that of light radiations velocity (cm/sec) is .(2.998x1010),Then, from <LE = lm.lc2> (5) Eqn. we get,

< LE (ergs) = (1024kg)X (2. 998x1010x2.> OR < LE (ergs)= (1024 kg)X(8.989X1020)> (17)Eqn.

(b) Application of 'GEL' Eqn:

in the study of detoxification of Lunar Toxic Gases (LTG) by enhancing the Oxygen content, diminishing Methane, Carbon dioxide, creating water & minerals through catalytic chemical processes it's obvious that there would be many measurements, particularly where there is an evolution or absorption of heat, as in chemical reactions particularly exothermic & endothermic reactions, the energy is expressed in heat units or calories.1(thermo-chemical) calorie being defined as equivalent to 4.184x107 ergs. By making this substitution into 'GEL-Eqn. (5) Eqn. the eqn. (13) takes the form,

< LE (calories) = (1024 kg) X2.148X1013 >….(18)Eqn.

(c). Research Methodology for Harnessing of Lunar Energy by VG: Lunar Tracking Mechanism (LTM)&VG: Lunar Trackers (LT):

Though there are ample methods available in literature to harness Solar energy and convert into electrical energy but hardly is a mention to harness Lunar Energy. The proposed methods may be either based on the use series of concave lenses and converged the Lunar rays by powerful telescopic instruments or an instrument like that of Sunshine Recorder i.e. Lunar-Shine Recorder (LSR) as well as instruments based on tracking mechanisms.
The Lunar-Shine Recorder (LSR) or Lunar Terminator Light Recorder (LTLR) comprising temperature recording device, may be developed based on CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer) & XSM(X-Ray Solar Monitor)& Synthetic Aperture Radar (SAR); to get converged/concentrated on a unit area characteristics of Lunar radiations specially reflected and scattered radiations along the Terminator to measure the duration and temperature rise/fall if any on the unit area as well as to observe X-rays emitted if any, from the Moon and lunar corona from the sunlit portion of the Moon along the Terminator.

Also, it's proposed to develop proposed Lunar Photo Voltaic System (LPV) system to harness Lunar Energy and convert into electrical energy as its being done in case of Solar energy. As in order to obtain more power by increasing the receptance of incident rays from Sun, the Solar Trackers are used, so in the same fashion the Lunar Trackers (LT) could be developed to increase the receptance of incident rays from the Moon and convert into electrical energy by using Lunar Trackers (LT) which would be a source of power generation for future inhabitants on the Moon. Based on the proposed Lunar Tracking Mechanism (LTM) solar tracking mechanism has been developed and Lunar Tracker which may convert the Lunar energy to electrical energy are under process. The proposed Lunar Tracker (LT) is programmed in such a way that it gets tilted to follow Moon's movement accurately throughout the night. It is assumed that the generated output power with the said Lunar tracking should be higher in comparison to the fixed proposed Lunar Photo Voltaic System (LPV) system.

(d) Research Methodology to Study the Morphological Characteristics of Lunar surface:

Lunar Energy may be harnessed by studying the morphology of Moon through certain modifications in Chandra's Surface Thermophysical Experiment (Cha S T E), to study the thermal properties of lunar surface near sub-polar ,mid-regions and lower regions can be explored and this may lead to determine Horizontal Structure of the Lunar Atmosphere like that of Earth's atmosphere as graphically Moon is also in circular shape and does consist of Moon rocks, craters, Moon quake and volcanoes like earthquakes, mountains, volcanoes on the Earth. There seems to be a possibility of two lunar hemispheres viz. Lunar Northern & Lunar Southern Hemisphere i..e. L(NH) & L(SH) respectively.

(e) Research Methodology to Study Chemisorption/Absorption of Lunar rays & catalytic-effects:

The characteristics of Lunar radiations specially reflected and scattered radiations may be studied through Chadrayaan-2 payloads viz. CLASS (Chandrayan-2/NASA Large Area Soft X-ray Spectrometer) & XSM (X-Ray Solar Monitor),with certain modifications, to observe X-rays emitted if any, from the Moon and lunar corona from the sunlit portion of the Moon along the Terminator. Next, the chemisorption /absorption of Lunar rays be studied by established Methods to investigate the catalytic effects.

(f) Research Methodology to Study of Lunar Spectra by using the Solar Spectra Techniques:

In my view, CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer) with certain modifications can also be used to study any change in spectrum of the light along the Terminator(the

line separating the sunlit and dark side of the Moon)Similarly, XSM X-Ray Solar Monitor))may also employed with certain modification to observe X-rays emitted if any, from the Moon and lunar corona from the sunlit portion of the Moon along the Terminator.

(g) Research Methodology to Develop Lunar Lasers / Laser Technology:

The modified version of Laser-induced breakdown spectroscopy (LIBS) may be used to develop Lunar Laser technology by detecting and quantitatively/qualitatively studying the 17 major elements(Na, Mg, Al, Si, K, Ca, Fe, Cr, Mn, Ti, H, He, C, N, O, P & S) that commonly found in lunar-rock forming minerals. Laser-induced breakdown spectroscopy is a total multi-elemental analytical technique based on atomic emission spectroscopy.(h) Explore the new methods of Mitigation of GHG to control the Earth's Global Warming through Lunar Energy by means of Lunar Panels ,Lunar Cells, Lunar Storage Batteries System (LSBS) for Lunar Energy Storage.

(h) Research Methodology for Chemical Analysis of Lunar Soil:

By using the Alpha Particle X-ray Spectrometer (APXS) on-board ISRO-Chandrayaan-2 rover; the Chemical Analysis of the elemental composition of lunar soil and rocks, would be taken up to detect elements such as Mg, Al, Si, K, Ca, Ti, and Fe through characteristic X-rays emitted from particle excitation and X-ray fluorescence processes.

(i) Research Methodology For Lunar Mineral Detection:

By using 'ISRO-Chadrayaan-2'/NASA, Laser-induced breakdown spectroscopy(LIBS)payload; nearly 17 major elements (Na, Mg, Al, Si, K, Ca, Fe, Cr, Mn, Ti, H, He, C, N, O, P & S) that commonly found in lunar-rock forming minerals shall be detected and quantitatively analyzed. Next, the thermal characteristics of these elements would be studied by DTA measurements and would be investigated. LIBS is a total multi-elemental analytical technique based on atomic emission spectroscopy.

(j) Research Methodology for Mitigation of Lunar-Methane(CH4)l & Lunar Carbon dioxide (CO2):

to control Lunar Daytime Warming (LDW) by Catalytic Process :Warming Methane (CH4) is 20 times more than Carbon dioxide ;i.e.20 moles of CO2 = 1 mole of CH4 .Both these gases are also present in Moon and hence it's imperative to mitigate these lunar gases viz. Lunar-Methane(CH4)l & Lunar Carbon dioxide (CO2) to control Lunar Daytime Warming (LDW) by modifying the above stated tested Chemical (Catalytic) processes # to mitigate Methane by catalytic processes in case of GHG(Green House Gases) provided one is able to detect signatures of hydroxyl (OH) and water (H2O) molecules in polar region by using æ Chadrayan-2 payload Imaging IR Spectrometer(IIRS. The IIRS has been designed to image the moon surface in 0.8-to-5-micron spectral region to investigate &identify minerals and detection of signatures of hydroxyl(OH), and water(H2O)molecules-in-Polar-region.

(K) Research Methodology to detect Water on Moon By WSN-Technology:

Dr. Prabhat Ranjan, at ISRO,10Sep'19, suggested this WSN to explore Water on Moon. WSN can help to locate sources of water on moon. One of the possible locations is permanently shadowed regions (PSR) of moon. Few craters in the polar region of moon may hold water. The WSW- sensor balls(nodes) are to be thrown into PSR region like a projectile in such a way that they make safe landing, detect ice and form network among themselves to communicate findings to orbiter or lander depending upon communication links. Since, the Temperatures are close to -200 degree C so the nodes would not survive for long. They had to perform their task quickly and send out the data as fast as possible as depicted in Fig 2. below.

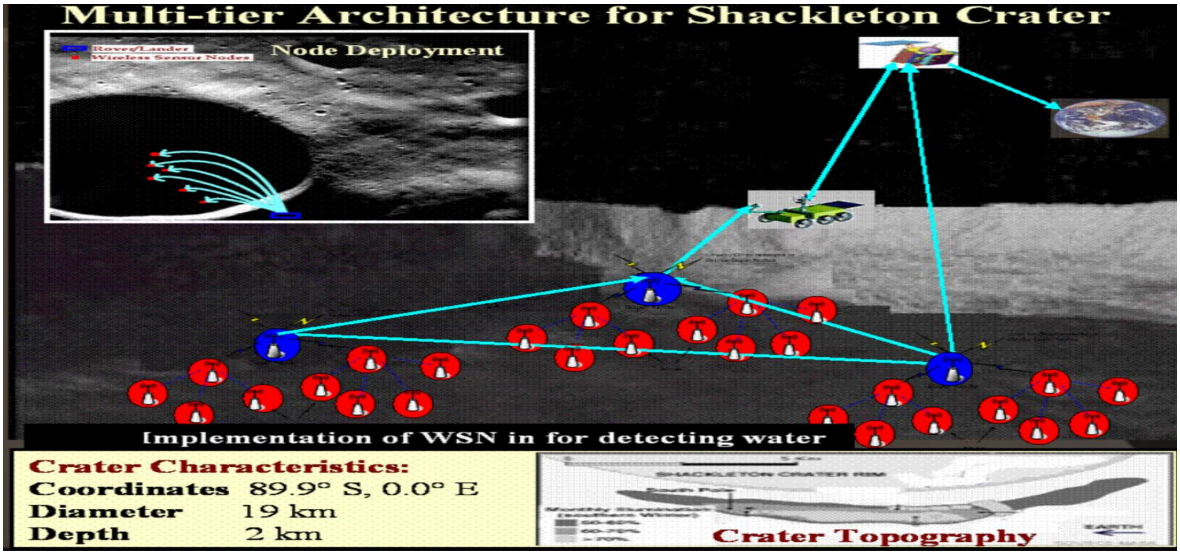

Figure 2: Higher Seismic Activity Measured by WSN, to Study the Origin of Moon.

4. Conclusion

Further, as per my view ;the possible warming of climate due to "Green House" effect of increase in Carbon-dioxide and Methane etc. can be lessened by increasing Lunar Radiations ,perhaps through future Lunar Lasers Technology (LLT)& planetary, interplanetary, and interstellar dust grains i.e. Lunar Dust Grains.* or 'Lunar Dust Grains Absorbent Beds'(LDAB) for the absorption of GHG acting as 'GHG-Sinks' & Chloro-Fluro Carbon(CFC) be replaced through Magnetic Refrigeration Techniques (MRT) using transition metal oxide catalyst. The present proposed study through ISRO's-Chadrayan-2/3/NASA payloads; will not only evolve Lunar Science by studying Lunar Radiation ,Lunar Energy ,Day Lunar Warming(DLW),Night Lunar Cooling (NLC) Lunar Cells, Lunar Energy Equation, Lunar Cooling & apply Lunar Energy for the detoxification of Green House Gases to Control of Global Warming through Chemical processes by making use of Magnetic Refrigeration, Lunar lasers & Lunar Cooling Towers but, also open the doors to make the studies on other planetary systems e.g. Mars through planetary, interplanetary, and interstellar dust grains. Next, after verification experimentally, the plausibly developed Lunar Energy Equation & Luton-Effect, a similar energy equation may be developed and proved in case of other planetary bodies as well. For Example, Mars Planet or say ISRO-Magalayan-2/NASA Mars Missions to explore the possibility of life.

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