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# INTEGRATION OF PHYSICS AND MATHEMATICS KNOWLEDGE INTO HOLY QURAN

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# ABSTRACT

This study is to shed some light and highlight some of the contributions made by Muslim scientists and thinkers to the development of science and technology Some people, particularly religious people had the view of seen the knowledge of science and technology as a contradiction to their religious knowledge. Some believe that the knowledge is aimed at doing away with their own religious believe and culture. Thus, they regard the knowledge as useless to them and their society in general, their perception of the content of the western knowledge being full of modem culture which in one way or the other contradicts their own. While others believe that all the knowledge was from the west therefore, it is the western property nobody else contributed to the development of the knowledge. This article will only provide the detail account history of the prominent Muslims scientists and thinkers, with their contributions in the field of physics and mathematics. Muslims has contributed in all the areas of physics particularly optics mechanics, dvnamics. kinematics and also mathematics in areas such as geometry, numbers theory algebra e.t.c.

KEY WORDS; integration, physics, mathematics, Qur`an and theory

# INTRODUCTION

Many people in the world have developed interest in relations to science and the Islamic teachings. This is due to the fact that many people of curiosity all over the world keep on writing in this area of study. In the field of mathematics the number zero (0) and the decimal system was introduced by the Muslims' scientists which became the basis for scientific revolution. The Arabic numerals were also transferred to Europe this made mathematical tasks easier, problems that took days to solve could be solved in minutes. The work of Al-khawazimi (Alghorimus) was translated into Latin. Algorisms, from whom the mathematical term algorithm was derived. He wrote Sind hind; a compilation of astronomical tables. He more importantly laid the ground work for Algebra and found method to deal with complex mathematical problems, such as square roots, and complex fractions. He conducted so many experiments, measures the height of the atmosphere and discovered the principles of magnifying lenses.

Trigonometric work by Alkirmani of Tolodo was translated into Latin (from which we get sine and cosine) along with the Greek knowledge by Euclid.

Jabir Ibn Hayyan (Geber) was the leading chemist in the Muslim world; some scholars linked scientific method back to him. A great number of terms used in chemistry such as Alcohol, alembic, Alkali and elixirs are of Islamic origin (The Islamic Herald/Herald@ais.org.). Quran has principles that serve as a reference for generating theory and can be developed in the world of education [1]. Ar Qurani (Al-Ibrah Qurani) is an innovative learning media of the Qur'an's exemplary story to create a generation of Quranic soul and strengthening character building in Indonesian children [2]. This development produces learning media by integrating the science of Al-Quran with physics. Lexically, the term 'integration' is derived from the English integration of the integrate verb meaning to combine, integrate, unite, or integrate [3]. There are so many

Spiritual values that can be cultivated in the study of physics is closely related to the concept of physics[4]. The concept can be run with the support of learning tools in accordance with the development of the 21st Century [5]

### BARRACK OBAMA AND THE ISLAMIC SCIENCE

In his speech in Cairo at the major rececption Hall cairo university, Egypt on 4<sup>th</sup> June 2009. President Barrack Obama indicated his intensions to support scientific initiatives in the Islamic world as part of his vision for promoting peaceful relations between the US and the countries with a Muslim majority. In his words: "On science and technology, we will launch a new fund to support technology development in Muslim majority countries and to help transfer ideas to the market place so that they can create jobs. We will open centers of scientific excellence in Africa, the middle east and the south-west Asia and appoint new science envoys to collaborate on programs that develop

new source of energy, create green jobs, digitize records clean water and grow new crops and today I am announcing a new global effects with the organization of the Islamic conference to eradicate polio"[6].

# ASTRONOMICAL QUR'ANIC METHOD FOR THE DETERMINATION OF GREATEST SPEED

The velocity of light C in a vacuum belongs to a small group of the fundamental constants however, it occupies an outstanding position even in this group. It is encountered in very different branch of physics.

The validity condition of the second postulate of special relatively is considered in the present work because constancy of the velocity needs absolute space (vacuum). To attained vacuum in Einstein's sense of this word, it is not sufficient just to eliminate from the volume of the space every atom, molecule and particle, it is necessary also to get rid of the gravitational field. Therefore we have screened out the effect of the solar gravitational field on the geocentric orbital motion of the moon, which is considered here according to applied Qur'anic equation: as a standard measure reference for evaluating the greatest cosmic speed described in the holy Qur'anic verses.

# LUNAR ORBITAL MOTION DESCRIBED IN QUR'ANIC

"God is the one who made the sun a shiny glory and the moon as light and for her ordained mansions, so that you might know the number of years and reckoning" (Qur'an:10:5)

The lunar year is twelve (12) months, the month is recently defined as the time of one revolution of the moon in its orbit around the earth. God hints at such orbit in the Qur'an.

"God is the one who created the night the day the sun and the moon, each one travelling in an orbit with its own motion" (Qur'an:21:33).

Here, essential scientific fact is clearly stated, namely the existence of the sun's earths and moon's orbits, besides references is made to the travelling of these celestial bodies in space with their own motion. A new concept had therefore been established in the Qur'an, hundred years before it was discovered by modem science.

As the moon orbits around the earth, the changes in relative position of the moon; its phases. The time between consecutive new moon is 29.53days, called synodic month. During this time however the earth and consequently the moon's orbit have travelled some way around the sun, so position of the moon against the background of the stars is different. The time for the moon to return to the position in the sidereal month (27.32 days). Which represents the actual real net time of one revolution in the moons orbit. This orbit is almost circular having an average radius r = 384264 km.

Period	Sidereal	Synodic
Lunar month T	27.321 days = 655.71986 hours	29.53059 days
Terrestrial	23h,56min,	24hours=86400sec
day	4.0906sec=86164.0906sec	

The length of the moon's orbit L and the time t of terrestrial day are correlated in a marvelous Qur'anic verse which describes a universal constant velocity of certain cosmic affair as follow:

"God rules the cosmic affair from the heaven to the earth. Then this affair travels to him (i.e. through the whole universe) in one day where the measure is one thousand years of your reckoning (Qur'an, 32:5)".

The Qur'anic expressions "of your reckoning" leaves no doubt as to our understanding of the years as the lunar year.

The verse begins with reference to a certain cosmic affair which God creates and commands. This affair travels, permanently through the whole universal between the heaven and the earth. So speedily that it crosses in ONE DAY a maximum distance in space equivalent to that which moon passes during ONE THOUSAND lunar year. (i.e. 12x1000=12,000 sidereal month) then to determine the greatest speed of the cosmic affair the above mentioned Qur'anic verse has been understood in terms of the following equations:

The distance crossed in vacuum by the universal cosmic affair in one sidereal day = length of 12,000 revolutions of the moon around the earth.

Since 
$$Speed = \frac{distance}{time}$$

distance = speed x time

$$ct = 12000 \ x \ L$$

(1)

Where c is the speed of cosmic affair, t is the time of one terrestrial day defined as the time of rotation of the earth about its axis (relative to the stars) i.e. 23hr, 56min, 4.0906 sec = 86164.0906sec., and L is the initial distance which moon covers in one revolution around the earth during one sidereal month. To find L:

if v is the measured average velocity of the moon deduce from the average radius R of the lunar geocentric orbit as measured from an orbiting earth during its heliocentric motion

$$v = \frac{distance}{time} = \frac{2\pi r}{T} \tag{2}$$

Substituting R = 384264 and T = 655.7186hr.

 $v = \frac{2 \times 3.142 \times 384264}{655.7186}$ 

v = 3682.07 km/hr

This value is given in all text book of astronomy and is accepted by NASA.

If  $\theta$  is the angle travelled by the earth system around the sun during one sidereal month of period 27.321661 days. We can calculate 0 if taking into consideration the period (365.25636 days) as one heliocentric revolution (i.e., 1 year) of the earth-moon system.

$$\theta = \frac{27.321661 \times 360}{365.25636} = 26.9848$$

Thus,  $\theta$  is a characteristics consist of this system depending on uniform periods of the month and year.

Since the presence of the sun changes the geometrical properties of space and time we must screen out its gravitational effect on the earth-moon system according to the validity of the second postulate of special relativity i.e. we must only consider the lunar geocentric motion without the heliocentric motion of the earth-moon system. Thus, a velocity component  $v_{\circ} = v\cos \theta$ , representing the net orbit calculating the net length L, of the lunar orbit assuming a stationary earth.

$$L = v\cos \theta T \tag{3}$$

From Eqn (1) and (2)

ct = 12000 x *νcos* θ T (4)

c = 12000 x  $v \cos \theta T$ 

# $c = \frac{12000 \times \cos 26.92848 \times 655.71986}{86164.0906}$

c = 299792.5 km/s

The international value of c = 29972.45km/s, we find an extremely marvelous agreement. Thus, we concludes that this cosmic affair mention in the previous Qur'anic verse is identical to light; and similar cosmic affair travelling in vacuum with this maximum speed such as all types of electromagnetic waves propagating between the heaven and the earth, the expected gravitational Waves spreading through all the universe and all particles travelling with this cosmic greatest speed such as neutrons [7]

#### METHODOLOGY

The method of collection or getting data for this project is mainly the internet, and some reference text, of both America and Britannica, the international dictionary and the rest, but the main source is the internet. The data obtained from the internet is summarized in the project.

# CONTRIBUTIONS

# Physics (Optics)

Ibn al-hytham was considered a pioneer of optics and the scientific method, he developed a broad theory of light in his book of optics which explained vision using geometry and anatomy, and stated that each point on an illuminated area or object radiates light rays in every direction but the only one ray from each point, which strikes the eye perpendicularly can be seen. The other rays strike at different angles and are not seen. He used the example of the camera obscure and pinhole camera, which produces an inverted image to support his argument. This contradicted Ptolemy's theory of vision that objects are seen by rays of light emanating from the eyes, Alhacen held that light rays are streams of minute particles that traveled at a finite speed. He improved accurately described the refraction of light and discover the 1aw of refraction. He dealt at length with the theory of various physical phenomena like shadows, eclipses and the rainbow. He also attempted to explain binocular vision and the moon illusion.

# Other treatises on optics

Beside the book of optics, lbn alhaythan wrote a number of other treatises on optics. His Risala FilDaw (treatise on light). Is supplement to his kitabal\_manazir (book of optics). The text contained further investigations on the properties of luminance and its radiant dispersion through various transparent and translucent media, he carried out also further observations investigation and examinations on the anatomy of the eye the density of the atmosphere catoptrics, spherical and parabolic mirrors and magnifying lenses [8].

# Astrophysics, Celestial Mechanics and Statics

In astrophysics and celestial mechanics field of physics lbn Al-Haytham in his epitome of astronomy, discovered that heavenly bodies were accountable to the laws of physics Ibn Al-Hytham's Mizan Al-Hikmah (balance of wisdom) dealt with statics, astrophysics, and celestial mechanics, he discussed the theory of attraction between masses, and it seems that he was also aware of the magnitude of acceleration due to gravity at a distance.

His book, Magala fil Qarastun, is a treatise on center of gravity. Little is currently known about the work except for what is known through the latter work of al-Khazimi in the twelfth century. In this treatise, Ibn Al-Haytham formulated the theory that the heaviness of bodies varies with their distance from the centre of the earth.

# Dynamics and kinematics

In the dynamic and kinematics fields of mechanism, Ibn Al-Haythan's Risala fill makan (treatise on place) discourses theories on the motion of a body. He maintained that a body moves perpetually unless an external force stops it or changes its direction of motion. This was a precursor to the law of inertia later stated by Galileo Galilee in the sixteenth century and now known as Newton's first law of motion.

Ibn Al - Haythan discovered the concept of momentum part of Newton's second law of motion around the same time as his contemporary, Abu Ali Ibn Sina (Avicenna). 4.1.13 Astronomy

# MATHEMATICS

In mathematics, ibn alhaytham builds on the mathematical works of Euclid and the bit ibn quna and goes on to systemize infinitesimal calculueomic section, number theory and analytic geometry. After linking algebra geometry.

### Geometry

In geometry, ibn al-thaytham developed analytical geometry by establishing the linkage between algebra and geometry, ibn alhaythem also discovered a formula for adding the first 100 natural numbers (which may later have been intuited by carl friend rich gauss as as yough). Ibn al-haytham used a geometric proof to prove the postulate was also similar to the Lambert quafriletered and play fairs axiom in the eighteen century.

In elementary geometry, Ibn al-Haytham attempted to solve the problem of squaring the circle using the area of lures but gk. Ibn Al-Haytham also tackled other problems in elementary (Euclidean) and advanced (Apollonian and Archimedean) geometry, some of which he was the first to solve.

# Number Theory

His contribution to number theory includes his work on perfect number, in his analysis and synthesis, Ibn Al-Haytham was the first to realized that every even perfect number is of the form 2n-1(2n - 1) where 2n-1, is prime, but he was also not able to prove this result successfully; Euler later proved it in the eighteenth century.

Ibn al — Haythan solved problems involving congruence's using what is now called Wilson's theorem. In his opusculla, Ibn al — Haythan considers the solution of congruences, methods of solution. His first method (the canonical) involved Wilson's gives two general theorem, while his second method involved the Chinese remainder theorem.

Wan [8] describe the invention of Mathematical knowledge by Islamic Scholars as described by Shahari Md and Abdul-Latif [9]. The concept of shapes in the Holy Qur'an were described with examples of 2D and 3D shapes.

The concepts of shapes in the Holy Qur'an

The concepts of shapes has been mentioned in Surah An- naziat verse 30: 'And we have made the earth egg shaped'

For many centuries people believed that the shape of the earth is flat with no idea that the earth is spherical [8]. The Holy Qur'an has proved it in the above verse.

The Arabic word "Dahaha" means egg shaped. It can also mean an expanse.

Dahaha is derived from Duhiya which specifically refers to the egg of an Ostrich which is geopherical in shape, exactly like the shape of the earth.

The concepts of length in the Holy Qur'an

In Surah Al-Fajirverse 13Allah has mentioned how to evaluate lengths.

'He merges Night into Day, and he merges day into Night, and he has subjected the sun and the moon (to his law); each one runs its course for a term appointed. Such is Allah your lord: to him belongs all Dominians. And those whom ye invoke besides Him hare not the list power.

Architectural concept in the Holy Qur'an

The verses that describe Architecture in the Holy Qur'an include; Al-Shu'ara 129 and Al-Qasas verse 38.

In the Surah Al-Shu'ara: 129 Allah has mentioned that;

'And do ye get for your dues find building in the hope of living therein (forever)'

Still on the concept of Architecture, the art of bricks were described in Surah Al-Qasas verse 38;

"Pharaoh said; O chiefs! No god do I know for but my self; therefore, O Humans! Light me a (Kiln to bake bricks) out of day and build me a lofty palace that I may mount up to the god of Moses: but as far as I am concerned I think (Moses) is a liar!"

Some arithmetic concepts in the Holy Qur'an operations

Some of the basic arithmetic operations that we are using in our daily lives include; Addition, Subtraction, Multiplication, Division, Ratio and Proportions. The Holy Qur'an has dearly described some of these operations in some verses. For examples;

# The concept of Addition

Allah has mentioned in the Holy Qur'an in Surah Al-Kahf Verse 25 that;

'And they staged in their care there hundred solar years and add nine (9) for lunar years'

The concept of Minus

The minus concept in Surah Al-Ankabut verse 14.

'We conee sent Noah to his people, and he tried among them a thousand years less lifty: but the Deluge overwhelmed them while they (persisted in) sin?'

The concept of Multiplication

The concept of multiplication was described in Suarh Al-Hadid verse 18.

'For those who gave in charity, men and women, and loan to Allah a beautiful loan, it shall be increased manifold (to their credit). And they should have (besides) a liberal reward'

The concept of Division

The division concept was described in surah Al-Nisaa verse 11.

"Allah commands you as regards your children inheritance; to the male a portion equal to that of two females; if there are only daughters two or more, their share is two third of the inheritance; if only one, her share is half. For parents, a sixth share of inheritance to each of the deceased left children, if no children and the parents are the only heirs the mother has a third, if the deceased left brothers or sisters, the mother has a sixth.

The distribution in all cases is after the payment of legacies he may have be quathed or debts. You know not which of them, whether your parents or your children are nearest to you in benefit. These fixed shares are ordered by Allah and Allah is ever all knower all wise'

The concept of Ratio and Proportion

The concept of ratio is described in Surah Al-Nisaa verse 7.

'There is share for men and a share for women for what is left by parents and those nearest related, whether the property be small or large a legal share'.

## SUMMARY

Science as a systematic and organized body of knowledge about the structure and the behavior of the natural and physical world, based on facts that can be provide through experiment does not only limited itself to some geographical areas of the world or belongs to some people or tribe in the world but rather as so many different kinds of natural experiences and events occurs all over the world so also the observation of such natural agencies to provide reliable explanation about them is also all over the world.

Many people from other part of the world has lived before the so called prominent scientists of the western world, who, in one way or the other pointed at some facts about certain things that occurs & naturally. Historical development of science and technology in some of the muslim countries such as ancient/old SPAIN and BAGHDAD Damascus etc. minds that muslims were also part of the present technological advancement in the world.

Not only the muslims of the then sages that contributed but also the content of the Islamic knowledge itself has provided some facts that attracts attention of so many scholars in the world to mention a few OBAMA and some other Islamic scholars. Rapid understanding of the Quranic verses and prophetic tradition has gave birth to some discoveries in the content of the verses, which perfectly agreed with the findings of the present using advance instrument e.g.

(1) Astronomical qur'anic method e.g. determination of greatest speed.

(2) The big bang theory; - the infinite theory of the universe

# CONCLUSION

This Article has shown that many Muslims has contributed to the development of science and technology of the present day thus further investigation reveals the relation between the qur'an and modem science such investigation includes. The use of the qur'anic verse to determine the greatest speed theory of the big bang e.t.c Muslims has contributed in all the areas of physics particularly optics mechanics, dynamics, kinematics and also mathematics in areas such as geometry, numbers theory algebra e.t.c.

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