

A Brief History of Primordial Light from the Perspectives of Sufi and Modern Science

Sejarah Ringkas Cahaya Primordium dari Perspektif Sufi dan Sains Moden

WAN QASHISHAH AKMAL WAN RAZALI
AHMAD FAKHRURRAZI MOHAMMED ZABIDI
SHAHIDAN RADIMAN
ABDUL LATIF SAMIAN

ABSTRACT

The primordial light is fundamental in the creation of the universe from the Sufi cosmology. In particular of the Sufi tradition, the Ishrāqī (illumination) school serves as a major School of thought in the Islamic intellectual history with the knowledge of the Muhammadan Light (Nūr Muhammad) becoming the most prominent cosmological point of debate among of Muslim scholars. To date, discussions and reviews on the understanding of the Muhammadan Light from the perspective of theology, literature, philosophy and the cosmological view in comparison to modern cosmology are still lacking. In modern cosmology, the Big Bang theory which is directly related to the light cosmology has been significantly discussed. The present study provides additional evidence with respect to the cosmological perspective highlighting the importance of light cosmology aspects with the insights of combining both cosmological postulates by evidence of direct connection with current modern and Sufi cosmology (worldviews). The present study renders the understanding of the gnosis of God and His Prophet Muhammad PBUH through the light cosmology perspective.

Keywords: Cosmology; Nūr Muhammad; Big Bang; light; Sufism

ABSTRAK

Cahaya primordium merupakan asas dalam penciptaan alam semesta daripada kosmologi sufi. Mengikut tradisi sufi khususnya, mazhab Ishrāqī (Iluminasi) berfungsi sebagai mazhab pemikiran utama dalam sejarah intelektual Islam dengan pengetahuan tentang cahaya Muhammadan (Nūr Muhammad), ia menjadi titik perbincangan kosmologi terkenal di kalangan para sarjana Muslim. Sehingga kini, perbincangan dan tinjauan mengenai pemahaman Cahaya Muhammad daripada perspektif teologi, sastera, falsafah dan pandangan alam kosmologi berbanding dengan kosmologi moden masih kurang dibahaskan. Dalam kosmologi moden, teori Letupan Besar yang mana secara langsung berkaitan dengan kosmologi cahaya telah banyak dibincangkan. Kajian ini memberikan bukti tambahan berkenaan perspektif kosmologi yang menekankan pentingnya aspek kosmologi cahaya melalui pandangan yang menggabungkan kedua-dua postulat kosmologi dengan bukti hubungan langsung menerusi kosmologi moden semasa dan kosmologi sufi (pandangan alam). Kajian ini memberikan pemahaman tentang ma'rifat kepada Allah SWT dan Rasul-Nya, Nabi Muhammad SAW melalui perspektif kosmologi cahaya.

Kata kunci: Kosmologi; Nūr Muhammad; Letupan Besar; cahaya; Sufi

INTRODUCTION

In understanding cosmology especially on the epistemology and the ontology of light, subject of light remains central amongst Sufis as mentioned in the Quranic verse which states that everything in the cosmos is connected to the Divine light: “*Allahu Nurus Samawate Woal-Ardh*” (Earth and Sky is the light of Allah) (An-Nur: 35) (Al-Ghazali 1984, Ibn ‘Arabi n.d., Suhrawardi n.d.). In the Sufi analytical interpretations regarding, the “*Nurun ala*

Nur” (An-Nur: 35) verse in Qur’an (the Light of Light) essentially refers to the God the Omnipotent and Prophet Muhammad PBUH as the primordial substance termed as the Muhammaddan light (Böwering 2001) which serves as the origin of all creations. In aspect of science, the construction of universe consists of both the earth and the sky primarily made of light (Hossain 2013). In philosophy, Skolimowski (2010) comprehensive review concluded that light is genesis, genesis is light which encompass four metamorphoses, i.e.

light as matter, light as life, light as creativity of life, light as divinity of life. Hence, the light cosmology has been elucidated and we have derived it from several definitions.

Light cosmology upholds from several definitions. Generally, cosmology is a discipline that encompasses study the history, evolution, origins and the formation of the universe (Coles 2001). Islamic scholar Sayyed Hossein Nasr (1992) is of the view that cosmology is a branch that discusses metaphysic or matter of the unseen as well as the religion and philosophy attributable to the concept of *tawheed* and the revelation. Cosmology in the modern term at large is a branch of astronomy that involves the study of the universe (Kragh 2004). The word 'cosmology' itself is derived from the Greek word 'cosmos' meaning 'the universe' and is related to the light and rays that enter the universe space (Kamus Dewan 1993). According to a definition provided by Ibn 'Arabi, the universe or cosmos is defined as everything other than God (*mā siwā Allah*) (Chittick 1998). Thereafter, it has been a primary concern about 'light' that has been growing since classical time and to now either from the Islamic perspective or science perspectives both physically or metaphysically (Murtono 2008). Therefore, light cosmology can be defined as a study of the history, evolution and the origin of the universe rendering the understanding of the provenance, the nature and the processes that took place from the perspective of Islamic cosmology or modern cosmology.

The Islamic cosmology centres on evidences revealed by the Qur'an and the Hadith to explain the divine and natural concept involving both the metaphysical and the physical aspects of the cosmology. This is because the questions of the universe and its phenomena have been featured in the *kawniyyah* (universality) verses to be important matters which are mentioned in the Qur'an (Fuad Mahbub Siraj 2014). Emphasis on the need to study and contemplate the nature and the universe as well as human activities is exemplified in the Quran (Al-Baqarah 164) for people to use reasoning and be cognisance of God's greatness. Additionally, the understanding of the creation of the universe is anchored upon the belief of God as the *khaliq* (Creator) and other creatures as *makhluq* (creation) (Al-Ghazali n. d.). Based on the Quran and the hadith there are various descriptions on the creation of the universe and with a comprehensive study of cosmology as explained in the Quran, the concept of cosmology as viewed from the Sufi and the modern cosmology can be reconciled.

Modern science depicts light in physical way instead of metaphysically or philosophically. Light is made up of several basic units called 'photons'. Consists of a quantum of electromagnetic energy, a photon is massless, with no electric charge and is a stable particle. Several studies of light have documented the property of light, its physical characteristics and the light theories (Zwinkels 2015). Regardless of the visibility, light is an electromagnetic radiation within a wide range of wavelengths ranging from gamma rays, X-rays, microwaves and radio waves of another spectrum (Montwill & Breslin 2008; Zwinkels 2015). Constantly in motion with invariable speed in a vacuum or a complete empty space, light which is formed from photons is somehow questioned on its dualistic property of whether it behaves as a wave or particle. The property of light provides a useful account in the understanding of the quantum laws of Nature and philosophy (Montwill & Breslin 2008).

The universe was discovered by western scientists in a perpetual state of expansion which begins around 13.7 billion years ago (Kragh 1996). As one of the most significant current discussion in the modern cosmology, the Big Bang theory, has been extensively discussed and debated as other theories are fall short of in elucidating the universe as claimed by experimental evidence. However, developments in the study of the religion and science philosophically have been critically analysed based upon the utilization of Islamic cosmology as proposed by Ibn 'Arabi and his followers in the Malay world (Mohamad Nasrin Nasir 2015). Thus, this study is significant in several ways as we focus on three specific objectives that are addressed with two linked brief literature reviews and its analysis. First, we carry out a brief literature review of period, scholars, treatises and the analysed categories of the Sufi cosmology i.e. the Muhammadan Light discussions. Second, we conduct a brief review of the literature of the Big Bang Theory as well as the view of what happened before the Big Bang. The third review focuses on discussions that specifically analysed of integrating both insights from these two complementary reviews of the light cosmology (worldview).

THE LIGHT OF MUHAMMADAN COSMOLOGY

The concept of *Nūr Muhammad* is rendered explainable in a form of Islamic mysticism which put emphasis on spiritual closeness with God

and introspection which is termed as Tasawwuf. According to Tasawwuf, *Nūr Muhammad* is the first being created by Allah SWT (Ibn ‘Arabi n. d.). It is the essence of all creations including the universe with every creation and incident emanates from the Muhammadan light. It is from this light, God the Omnipotent created all existence including *Qalam* (pen), *Kursiy* (sovereignty), *‘Arasy* (throne), seven layers of heaven and earth, angels, genies, moon, sun, elements and the rest of the creation came into being (Al-Qastallani n.d., Al-Haithami, n.d.). The Prophet Muhammad PBUH has said in Sahih Muslim:

“God has completed Qadr of every creature and worldly details 50,000 years before the creation of the heavens and the earth, and his *‘Arash* is on the liquid”.

Allah has said: “I made something because of you, O Muhammad (to know you), creates you by Me (Allah) because of Me (Allah).

Therefore, the light of Holy Prophet PBUH is an important cosmological point which becomes the *raison d’etre* of the whole creation and universe. This concept of light has been discussed profoundly in an in-depth Sufism discourses known as the ‘Seven Echelon’ (*Martabat Tujuh*).

On top of that, Allah SWT said in Qur’anic verse;

Allah is the Light of the heavens and the earth. The example of His light is like a niche within which is a lamp, the lamp is within glass, the glass as if it were a pearly [white] star lit from [the oil of] a blessed olive tree, neither of the east nor of the west, whose oil would almost glow even if untouched by fire. Light upon light.

(An-Nur: 35)

In order to decipher the meaning of some verses in Qur’an as *Nūr Muhammad*, one can allude to a few of *tafsirs* and scholars. The meaning of some verses in the Qur’an as regards *Nūr Muhammad* is further rendered by *tafsirs*, the science of interpretation and explanation of the Quran by the scholars. In the *tafsirs*, the focus of light referring to the Prophet

Muhammad (*Nūr Muhammad*) is indicated in verse 15 of Surah al-Maidah. *Mufasssirin* (author of tafsir) such as al-Tabari (923 AD), al-Razi (1209 AD), al-Qurtubi (1273 AD), al-Alusi (1854 AD) interpret the meaning of ‘*Nūr*’ (light) as Prophet Muhammad PBUH. In addition, in verse 35 of Surah al-Nūr, companions like Sa’id bin Jubayr and Ka’ab al-Ahbar interpreted *Nūr* in ‘*Mathalu Nūrihi*’ with *Nūr* Rasulullah ie the light of The Messenger. Accordingly, the meaning of “*Nūrihi*” as His messenger, the Prophet Muhammad was imparted by al-Alusi. Subsequently, al-Qusyairi (1072 AD), al-Razi and al-Sya’rawi (1998 AD) verbally agreed on the meaning *Nūr Muhammad*, respectively, with terms such as ‘*nūr tauhid*’, ‘*nūr al-hissi*’ and ‘*nūr al-batin*’, as well as ‘*nūr al-zahir*’ and ‘*nūr al-batin*’. Referring to verse 34 of Surah al-Baqarah, al-Naisaburi (1446 AD) made justification of the act of honour of angels by prostrating to Adam due to *Nūr Muhammad*. Meanwhile al-Maturidi and al-Mawardi discussed *Nūr Muhammad* in the hearts of the believers. Therefore, this concept needs to be examined in the Quran and Hadith as well as its history.

Research on the epistemology and history of the light of Muhammad has a long history based on the Qur’an and hadiths. Most hadiths on *Nūr Muhammad* have been narrated by the companions of the Prophet Muhammad PBUH known as the *sahabah*, i.e Ibnu Abbas, Jabir Ibnu Abdullah and Hassan Ibn Tsabit till Abd al-Razzaq al-San’any and was continued by *tabi’ al-tabi’in* and other Sufi scholars. It is noteworthy that other prophets from Adam AS to Jesus AS were noticed this light (Al-Raniri n. d.). The epistemology of the *Nūr Muhammad* or the Muhammadan Light has been developed and continued from generation to generation by prominent scholars. Hence, we have analysed some of the categories of the scholars who discussed the Muhammadan Light in time sequence and their treatises as illustrated in Table 1.

TABLE 1. Review of scholars and their categories

| Period | Scholar | Treatise | Category |
|-------------|---|--|-----------------|
| 796-860 AD | Dzun Nun al-Mishri | - | Theology |
| 818-896 AD | Abu Muhammad Sahl Al-Tustari | <i>Tafsir Al-Tustari</i> | Theology/Tafsir |
| 838-923 AD | Muhammad ibn Jarir al-Tabari | <i>Jāmi ‘ al-bayān ‘an ta’wīl āy al-Qur’ān</i> | Theology/Tafsir |
| 854M-938 AD | Abu Muhammad Abdurrahman bin Muhammad Abi Hatim | <i>Tafsirul Qur’an Al-Adhim Musnadan An Rosulillah Wash-Shohabat Wat-Tabi’in</i> | Theology/Tafsir |

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|------------------------|---|--|---|
| 858-922 AD | Al-Husayn bin Mansūr al-Hallāj | 1. <i>Kitāb al-Tawāsīn</i> 2. <i>Poems collected in Dīwān al-Hallāj</i> | Theology & Literature (poetry) |
| 1076-1148 AD | Abū ‘Abd Allāh Muḥammad ibn ‘Alī ibn Muḥammad ibn ‘Arabī | 1. <i>Al-Futuhat al-Makkiyah</i> 2. <i>Fusus al-Hikam</i> 3. <i>Tafsir al-Qur’an al-Karim</i> 4. <i>Syajaratul-Kaun</i> | Theology/Tafsir, Cosmology & Philosophy |
| 1078-1166 AD | Abdul Qadir Al-Jilani | <i>Kitab Sirr al-Asrar wa Mazhar al-Anwar</i> | Theology |
| 1154-1191 AD | Shahab al-Din Yahya Ibn Habash Suhrawardi | <i>Hayakal Al-Nur</i> | Theology & Light Philosophy |
| 1116-1201 AD | ‘Abd al-Raḥman b. ‘Ali b. Muḥammad Abu Farash b. al-Jauzi | <i>Tafsir Zād al-Masīr fi ‘Ilm al-Tafsīr</i> | Theology/Tafsir |
| 1149-1209 AD | Fakhr al-Dīn al-Rāzī | <i>Tafsir Fakhr al-Razi al-Mushtahir bi al-Tafsir al-Kabir wa Mafatih al-Ghayb</i> | Theology/Tafsir |
| 1214-1273 AD | Abu ‘Abdullah Muhammad ibn Ahmad ibn Abu Bakr al-Ansari al-Qurtubi | <i>Al-Jami’ li-Ahkam or Al-Jami’ li Ahkam al-Qur’an or Tafsir al-Jami’</i> | Theology/Tafsir |
| 1365-1424 AD | Abdul Karim Ibn Ibrahim Al-Jili | 1. <i>Al-Insan al-Kamil fi Ma’rifat Al-Awal wa al-Awakhir</i> 2. <i>Qab al-Qawsayn wa Multaqa al-Namusin</i> | Theology |
| 1459 AD | Jalal ad-Din al-Maḥalli | <i>Tafsir al-Jalalayn</i> | Theology/Tafsir |
| 1505 AD | Jalal ad-Din as-Suyuti | | |
| 1849-1932 AD | Yusuf Ibn Ismail Al-Nabhani | 1. <i>Al-Anwar al-Muhammadiyah min al-Mawahib al-Ladunniyah</i> 2. <i>Jawahir al-Bihar fi Fada’il al-Nabiyy al-Mukhtar</i> 3. <i>Hujjat al-‘alamin fi Mukjizat Sayid al-Mursalin</i> 4. <i>Sadat al-Darain fi al-Salat ‘ala Sayyid al-Kaunain Salla Allah ‘alih wa sallam</i> 5. <i>Jami’ Karamat Al-Auliya’</i> | Theology & Literature (poetry) |
| Archipelago’s Scholars | | | |
| 1404-1517 AD | Siti Jenar | - | Theology |
| 1607 AD | Hamzah Fansuri | 1. <i>Hikayat Melayu</i> 2. <i>Syair-syair Hamzah Fansuri</i> 3. <i>Asrar al-Arifin</i> | Theology & Literature (poetry) |
| 1615-1693 AD | Abd Rauf Al-Sinkiliy | - | Theology |
| 1769-1849 AD | Daud bin Abdullah al-Fathani | <i>Al Kaukab ad-Durri fin-Nuuril-Muhammadi</i> | Theology |

Source: Authors (2020)

Based on Table 1, one of the earliest Muslim scholars who discussed *Nūr Muhammad* in the form of a simple concept without establishing a theory was al-Tustariy (896 AD). A reference to *mathalu nūrihi* term (al-Nūr 24:35) was made the ‘metaphor of his light’ in reference to *Nūr Muhammad*. Likewise, in the Sufism discourse, this rings similarity to the opinion of Dhū al-Nūn al-Misriy (896 AD), a prominent Sufi figure, whose opinion is based on the *al-ma’rifah* theory which also states that the beginning of God’s creation was *Nūr Muhammad*. Additionally, in the Sufism theology, the concept of *Nūr Muhammad* has been in discourse but only in the literal form of the concept (*harfiyyah*) since the 3rd century of Hijri (Nur Kolis 2012). The opinions

of the two prominent Sufi figures, al-Mishri and al-Tustariy provided a new understanding of the *Nūr Muhammad* concept of cosmology. In the 4th Hijri century, Imam Al-Husayn bin Mansur al-Hallāj (922 AD) was a proponent of the *Nūr Muhammad* theory based on al-Tustariy’s interpretation of Surah al-Nūr. The *Nūr Muhammad* concept was later passed on to the next generation of scholars. After the 10th century, *Nūr Muhammad* concept was made well known by Sufi Scholar such as Sheikh Abdul Qadir Al-Jilani (1166 AD) (Sahabuddin 2004). The *Nūr Muhammad* concept was further developed and updated by Ibn ‘Arabi (1148 AD) assimilating the *Nūr Muhammad* concept in Sufism with the philosophy of al-Hallāj’s theory. It is apparent from

this table that very few scholars who discussed this concept in Cosmological Science and Philosophy like Ibn ‘Arabi and Suhrawardi.

Ibn ‘Arabi was the only scholar who combined both theology and cosmology (science) in particular of the *Nūr Muhammad* description. He was the first scholar who made detailed analysis on the spiritual experience from the inner field (*mawajid wa ahwal*) into the form of theoretical and logical sciences (Nur Kolis 2012). His wisdom in the field of science rendered the borne of new knowledge of tasawwuf or spiritual tarekat which flourished for six centuries. He was also among the influential figures in interpreting the *Nūr Muhammad*'s concept in the cosmology and philosophical view. This was further enhanced by Ibn Arabi's follower, Abdul Karim Ibn Ibrahim Al-Jili (1424 AD) who introduced the concept of Insanul Kamil originating from the *Nūr Muhammad* concept which was further developed by Sheikh Yusuf Ibn Ismail Al-Nabhani (1932 AD) (Sahabuddin 2004).

On the other hand, Suhrawardi (n.d.) holds the view that *Nūr Muhammad* in term of Philosophy subject. In the Sufi tradition, the *Ishrāqī* (illumination) school of thought pioneered by Suhrawardi Maqṭul has emerged dominant in explaining the metaphysics of light. Suhrawardi describes the ontic light reality of all beings originating from ‘the Light of Light’ in the likes of other eminent Sufis. Yet, the first created light (*Nur Muhammad*) is different from ‘the Light of Light’ in the degree of strength of its light (Suhrawardi n. d.). Suhrawardi was of the view that there are multiple hierarchies of light with the hierarchies of reality in which the lower lights desire for the higher ones, as similar as darkness desires for light. The closer the distance of the object to the source of the light determines the amount of light received as opposed to the further objects. God is the supreme source of light with the manifestation of all creations emanating from the Muhammadan light, manifesting all beings that enter into composition from material or immaterial substances. Several terms such as *isthmuses* (*Barzakh*), the Self-Subsisting Light, the Pure Light, the Holy Light, the Necessary Being and many more have been adopted in depicting the hierarchies of light (Muhammad Obaidullah 2015). Although Suhrawardi's treatises barely mentioned the gradation of light as the Light of Muhammadan, but the various term used in his treatise are almost similar with the names given by Ibnu ‘Arabi for *Nūr Muhammad*.

In comparison to Ibnu Arabi, various names have been used to attribute to *Nūr Muhammad*

or the Reality of Muhammad (*al-Haqiqah al-Muhammadiyah*), i.e the Reality of Reality (*Haqiqah al-Haqa'iq*), the Intermediary (*al-Barzakh*), the Throne (*al-'Arash*), the Spirit of Muhammad (*Ruh Muhammad*), the First Intellectual (*al-Aql al-Awwal*), the Most Might Spirit (*al-Ruh al-A'zam*), the Vicegerent (*al-Khalifah*), the Perfect Man (*al-Insan al-Kamil*), the Origin of Universe (*Azl al-'Alam*), the Real Adam (*Adam al-Haqiqi*), the Sphere of Life (*Falaq al-Hayah*), the Real who is the Instrument of Creation (*al-Haqq al-Makhlūq bih*), the Prima Matter (*al-Hayula*), the Spirit (*al-Ruh*), the Pole (*al-Qutb*), the Servant of Embracing (*Abd al-Jami'*) and others (Sahabuddin 2004). Seeming convergence of *al-Barzakh* or the Intermediary to Suhrawardi's *isthmuses* could be seen attributing to the role of *Nūr Muhammad* which becomes the intermediary between the universe and the shadow of the ‘Light of Light’. Hence, light cosmology can be delineated using the same concept as the Suhrawardi's Philosophy of Illumination which is the ‘science of light’ by using the single term of the ‘Light of Muhammad’.

In South East Asia in particular the Archipelago, the *Nūr Muhammad* concept was imparted by the likes of Sufis scholars such as Siti Jenar (1517 AD), Hamzah Fansuri (1607 AD), Syamsuddin Sumatrani (1630 AD), Abd Rauf Al-Sinkiliy (1693 AD), Daud bin Abdullah al-Fathani (1849 AD) and others. In classical studies of Sufism, The Muhammadan light has been a central albeit being debated by various scholars whether to receive or reject the cosmology argument. The dispute and controversies surrounding the Muhammadan light within the Islamic theology, revolves around the argument that the Muhammadan Light concept originates from Hinduism, Buddhism, Christianity, or Neoplatonism philosophy. The concept of *Nūr Muhammad* in the Islamic perspective is essentially different from other current religious beliefs as there are differences in terms of the contents or the meanings, likewise different from the Syi'ah doctrine (Muhamad Farhan Samsuddin & Fadzli Adam 2017).

THE MODERN COSMOLOGY

Modern cosmology has always been in the midst of a scientific revolution in particular in the physics field where experimental observations and interpretations are vital in confirming the Expanding Space Paradigm and the Cosmological Principle

(Baryshev et al. 1994). The Big Bang is sometimes referred to as ‘Primordial singularity’ (Roos 2008) although on a more generic term, it refers to early hot, dense phase of the universe (Drees 1990). The Big Bang theory is the most intriguing and sustainable theory in this century hinged on the physical cosmology Standard Model (SM). Based on the SM, the evolution of the universe at the early state began from an extremely high temperature by expanding, cooling, and developing structures at various scales (Stanford Encyclopedia of Philosophy 2017). The Standard Model theory was able explain phenomena such as the cosmic microwave background (CMB), abundance of light elements, and Hubble’s law (Roos 2008). The Big Bang has been known in the colloquial term as the ‘the birth of the universe’ whereby empirical evidence, the laws of physics work in particular the general relativity and the standard model of particle physics. The “age of the universe” was calculated as 13.799 ± 0.021 billion years based on the measurements of the expansion using Type Ia supernovae and measurements of temperature fluctuations in the cosmic microwave background (Planck Collaboration 2016). Albeit independent measurements, there seems to be an agreement of the age of the universe which supports the Λ CDM model that describes in detail the characteristics of the universe.

A backward extrapolation of the observed condition in time by using known laws of physics would result in a prediction of a very high-density period, a singularity which conventionally is associated with the Big Bang (Hawking & Ellis 1973). Current knowledge falls short in determining whether the singularity was primordial. Additionally, singularity indicates that general relativity is not sufficient in explaining the laws of physics in this regime. By using models which are based on general relativity alone no extrapolation toward the singularity beyond the end of the Planck epoch could be evident. Furthermore, backward extrapolation of the expansion of the universe in time, based on general relativity results in an infinite density and temperature at a finite time in the past. The notion of an expanding universe could be traced back in time to an originating single point was proposed by Georges Lemaître in 1927 calling his theory as the “primeval atom”. There was a division even among the scientific community as regards the two different theories, the Big Bang and the steady state theory although empirical evidences leaning towards the Big Bang theory which is now universally recognised (Kragh 1996). The Big Bang occurred over billion years ago passing through many different epochs and phases as shown in Figure 1 within the age of the universe.

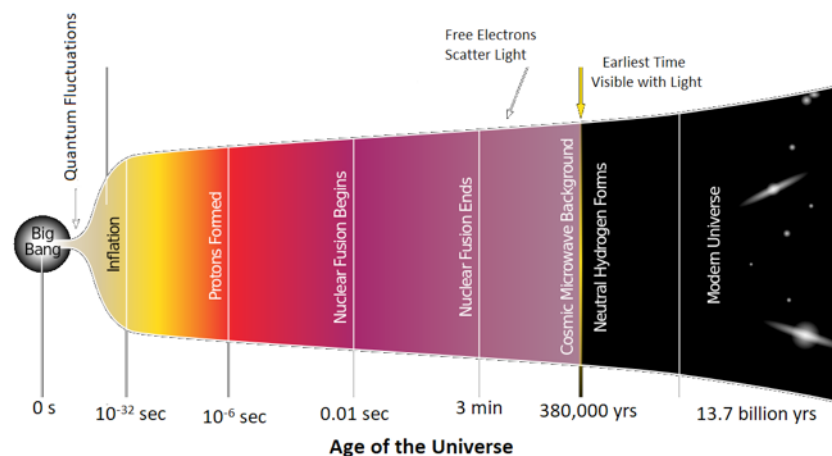


FIGURE 1. Age of the Universe
Source: Anonymous (2019)

The universe, however, did not re-collapse into a black hole despite being extremely dense at this time even far denser than is required to form a black hole. This can potentially be explained when taken into account that commonly used calculations

and limits for gravitational collapse are most times dependent on objects that are of relatively constant size, such as stars, and are not applicable to the rapidly expanding space such as the Big Bang.

TABLE 2. Summary of Cosmic Evolution

| Big Bang (Hogan C.J. 1998) | Summary of Cosmic Evolution (Anonymous 2019) |
|---|---|
| Radiation dominated era | |
| - Planck Epoch (10^{-43} sec) | The cosmos goes through a superfast 'inflation' evolving from the size of an atom to that of a grapefruit in a tiny fraction of a second. |
| - Grand Unification Epoch (10^{-43} sec to 10^{-36} sec) | |
| - Inflationary Epoch (10^{-36} sec to 10^{-32} sec) | Post-inflation the universe is a surge, hot soup of electrons, quarks and other particles. |
| - Electroweak Epoch (10^{-36} sec to 10^{-12} sec) | |
| - Quark Epoch (10^{-12} sec to 10^{-6} sec) | |
| - Hadron Epoch (10^{-6} sec to 1 sec) | A rapidly cooling cosmos enables quarks to assemble into protons and neutrons. |
| Matter dominated era | |
| - Nucleosynthesis (3 min to 20 min) | Still too hot to form into atoms, charged electrons and protons deter light from shining; the universe is a superhot fog. |
| - Photon Epoch (3 min to 240,000 yrs.) | |
| - Decoupling Matter-Radiation (240,000 to 300,000 yrs.) | |
| - Dark Age (300,000 to 150 million yrs.) | Electrons coalesce with protons and neutrons to form atoms, mostly hydrogen and helium. Light can finally shine. |
| - Reionization (150 million yrs. to 1 billion yrs.) | |
| - Galaxy and Star Formation (300-500 million yrs.) | Gravity makes hydrogen and helium gas combine to form the giant clouds that will become galaxies; smaller clumps of gas collapse to form the first stars. |
| - Solar System Formation (8.5 to 9 billion yrs.) | As galaxies cluster together under gravity, the first stars die and scatter heavy elements into space; these will eventually form into new stars and planets. |

Source: Authors (2020)

Table 2 explains the summary of cosmic evolution in the Big Bang theory (post Big Bang). The Big Bang period consists of two phases which begins with the radiation phase and the ensued matter phase. In the radiation phase, the Planck epoch (10^{-43} sec, temperature 10^{19} GeV) was suggested as the beginning of time followed by the Grand Unification epoch (10^{-43} sec to 10^{-36} sec) and the inflationary epoch (10^{-36} sec to 10^{-32} sec), at the temperature of 100 GeV in the vacuum energy. The creation of light started with transformation of the vacuum energy into particles such as the light quanta or photons, and equal numbers of particles and antiparticles, an event that took place above the temperature of 100 GeV which also led to the creation of baryonic matter in the baryogenesis process generating a small excess of electrons and quarks over antielectrons and antiquarks.

Within the strong epoch, transition to hadronic matter which are still evident in the universe till today such as various forms of dark matter such as the black holes were the results of the dense quark-gluon plasma or the 'quark soup' of universe (Hogan 1998). A surplus and survive quarks finally combine to form matter, and the other quarks and antiquarks

exterminate each other upon contact, a process that took place in the baryogenesis process. At Hadron epoch, lower temperature resulted in combination of quarks to form hadrons that annihilate with antihadrons. During the Lepton epoch, lepton (electron) and antileptons (positron) annihilation results in the release of photon as a form of energy.

In the matter period, a nucleus-synthesis process occurred with the light elements undergo combinations of neutrons and protons forming nuclei of simple elements such as the hydrogen, helium and lithium. Following the Lepton epoch in the radiation phase, the interaction of protons, electrons and nuclei continue leading to photons to dominate energy in the universe. Prior to the creation of galaxy, star and solar system, several phases ensued which include decoupling matter-radiation, the Dark Age and the reionization phases (as shown in the Table 2). Hence, based on physical observation, modern cosmology provides sufficient logic and rationale to explain the formation of the universe in terms of light formation. Until now, new discoveries and developments in the Big Bang theory have led to increased studies completing the theory in from both science and philosophy perspective.

Generally, the Big Bang theory is divided into two phases, i.e. pre-Big Bang and post-Big Bang. In the pre-Big Bang period, pre-geometry as a structure was applied to explain the universe spacetime with various pregeometric models suggested to feature some cosmological model in the pre-Big Bang period. As a matter of fact, pre-Big Bang physics is currently sufficient and adequate as a possible course in uniting gravity and quantum mechanics commonly known as theory of quantum gravity (Rovelli 2004). There are many various pregeometric models such as pregeometric graph, quantum metric spaces, causal sets and discrete spacetime.

THE ISLAMIC SCIENCE OF LIGHT COSMOLOGY

New intellectual discourses encompass ‘*Kalam*’ which is a school of philosophical theology that assert the existence of God as a prime mover and the freedom of the will, ‘*Tasawwuf*’, a form of Islamic mysticism with emphasis on introspection and spiritual closeness with God, *Philosophy* and ‘*Usul al-Fiqh*’ which is a form knowledge of principles or methodologies of deriving the rules. The discourses result in the use intellectual power (*aqliyyat*) in understanding the form of God revelation and prophetic tradition (*naqliyyat/sam’iyyat*) (Adia Setia 2011; Shahidan Radiman 2015). In addition, the Muslim *ummah* entails their own science followed on Islamic epistemology and methodology based on their true worldviews and values (Wan Fariza Alyati Wan Zakaria 2019). Additionally, the emergent discussion of theology and science in the cosmology field brings about the term ‘cosmogony’

which is related to the studies of the origin of the universe, covering the physical aspects of Quranic cosmogony with the modern cosmological theory of the Big Bang (Haslin Hasan & Ab. Hafiz Mat Tuah 2014). The study of the Big Bang theory conveys the big question about the God is existence. The big question that scientists could not explained is what happen before the Big Bang. Hence, the Muhammad Light could reveal the Divine Reality in order to achieve Gnosis knowledge.

As can be seen in Figure 2, there is a sharp contrast between the western cosmological order representing the modern science where the existence of the Creator is an enigma in understanding the origins of the universe. On the contrary, the Islamic cosmology provides solution by filling the missing puzzle of the origin of life by the existence God SWT as the creator with the *Nūr Muhammad* as the intermediary and the *raison d’etre* of all the creations. According to Al-Nabhani, *Nūr Muhammad* is the first creation and *al-Haba* is the second creation by Allah SWT. *Al-Haba* is the first creation in this world manifested from the *Nūr Muhammad* (Sahabuddin 2004). One denotes *al-Haba* as dust of cosmos (massless particle) in the Sufism term and also to the Holy Prophet’s light (Shahidan Radiman 2018). Interestingly, this is coincidental with the famous scholar Nikola Tesla who once said that everything is light. Tesla added that matter is created from the original and eternal energy that we know as Light (Edvard 2012). Based on these understandings, we have illustrated the gradation of existence of the universe as the manifestation of *Nūr Muhammad*, shown in Figure 2.

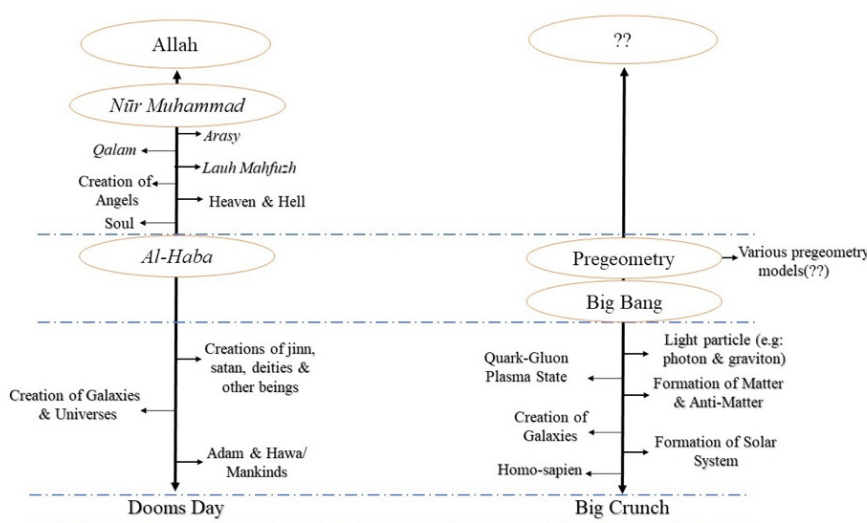


FIGURE 2. Gradation of existence (light)
Source: Authors (2020)

work is required to establish this integration. More research on this topic needs to be undertaken before the association between Sufi and modern cosmology is more clearly understood. In future investigations, it might be possible to elucidate how modern

scientific findings have influenced the interpretation of *Kauniyah* verses (*Tafsir al-Ilmi*) in the Quran by using the reflection approach (*Tadabbur*) in conjunction with the Quranic Subtleties (*Lataif Quraniyah*) framework.

TABLE 3. Review of Works in both cosmologies

| Scholars | Opinions on Cosmogony of Light | Relevance to Philosophical Concept |
|-------------------------|---|--|
| Mohamed Haj Yousef 2008 | Ibn 'Arabi's unique view of time in the 'oneness of being' theory has been compared with modern theories (physics and cosmology), describing the major outstanding problems such as the recent Einstein-Podolsky-Rosen (EPR) paradox. | - Sufi Principle - Gnosis - Metaphysics - Philosophical Physics |
| Mohamed Haj Yousef 2018 | The developed Single Monad Model and the resulting Duality of Time Theory could be led to the three principles of Special and General Relativity together, in addition to Quantum Field Theory. | -Sufi Principle -Gnosis -Metaphysics -Philosophical Physics |
| Shahidan Radiman 2015 | The knowledge of Sufism is linked with the findings in Quantum Mechanics to form <i>Kalam Jadid</i> (new Kalam). The parallelism of the Topological Quantum Field Theory and Sufism has been illustrated as the primordial unity of light, i.e. God and Prophet PBUH. | -Sufi Principle -Kalam Principle -Gnosis -Metaphysics -Philosophical Physics |
| Shahidan Radiman 2017 | The concept of gradation of beings can be explained in science from the Seven Echelons (<i>Martabat Tujuh</i>) that encompass Nur Muhammad doctrine. | -Sufi Principle -Gnosis -Metaphysics -Philosophical Physics |
| Shahidan Radiman 2017 | The Muhammadan Light is a 'flash ontology' that 'sparks' when it meets Nothingness (creation ex nihilo) to initiate the Big Bang. It has introduced quantum interpretations tools to illustrate the universe. | -Sufi Principle -Gnosis -Metaphysics -Philosophical Physics |
| Shahidan Radiman 2018 | Mapping of some Kalam Principles to Modern Physics has been proposed such as Kalam atomism (<i>al-jawhar al-fard</i>) and atomic time (<i>zaman al-fard</i>) and vacuum (<i>kala'</i>) | -Kalam Principle -Metaphysics -Philosophical Physics |
| Shahidan Radiman 2019 | Light cosmology in pre-Big Bang phase has been proposed as working philosophies for pregeometry models | -Metaphysics -Philosophical Physics |

Source: Authors (2020)

Few studies have investigated the fascinating light cosmology from the perspective of *Nūr Muhammad* and the comparison with the Big Bang theory. Studies by Mohamed Haj Yousef and Shahidan Radiman integrate both cosmogony perspectives as shown in Table 3. The relevant philosophical concepts have been analysed based on the opinions on the cosmogony of light of both scholars.

CONCLUSIONS

The concept of light cosmology either from the perspective of *Nūr Muhammad* or the Big Bang theory continues to evolve with times. Comparative studies putting together the two different cosmological perspectives have been lacking. The concept of *Nūr Muhammad* is often discussed in theology, while

the Big Bang theory is discussed in the context of modern cosmology and has been accepted by some Islamic scholars as parallels can be drawn from the events stated in the Quran. Combining both the *Nūr Muhammad* and the Big Bang theory will increase our understanding and the knowledge of the formation of the universe beyond empirical evidences alone, strengthening the conviction of the Gnosis of Allah SWT, Prophet Muhammad PBUH and the Divine Reality. Understanding the cosmogony of the universe with the spiritual as well as intellectual prowess coupled with the empirical evidences as provided by science, would open the path for better understanding of the formation of the universe and the existence of our beings. The present review provides an in-depth understanding of the gradation of existence as well as a spiritual journey to be cognizant of the Creator, Allah SWT and His messenger, Prophet Muhammad PBUH. Yet, further

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AUTHORS

Wan Qashishah Akmal Wan Razali
Institut Islam Hadhari,
Universiti Kebangsaan Malaysia,
43600 UKM Bangi,
Selangor, Malaysia
wanqashishahakmal@gmail.com

Dr. Ahmad Fakhurrizi Mohammed Zabidi
(Corresponding author)
Pusat Kajian al-Quran dan al-Sunnah,
Fakulti Pengajian Islam,
Universiti Kebangsaan Malaysia,
43600 UKM Bangi,
Selangor, Malaysia
dr.razimz@gmail.com

Shahidan Radiman
Pusat Pengajian Fizik Gunaan,
Fakulti of Sains dan Teknologi,
Universiti Kebangsaan Malaysia,
43600 UKM Bangi,
Selangor, Malaysia
shahidan@ukm.edu.my

Abdul Latif Samian
Institut Alam dan Tamadun Melayu (ATMA),
Universiti Kebangsaan Malaysia,
43600 UKM Bangi,
Selangor, Malaysia
dr.latifsamian@icloud.com