Al-Hisab: Journal of Islamic Astronomy | e-ISSN: 3046-8515
Vol.1, No.2, June 2024, pp. 90 - 100

The Role of Astronomy and Islamic Philosophical Wisdom through Muslim Philosophical Thought in Understanding the Phenomena of the Universe

Fadilla Sayu Ananda[1], Alya Fathi Muhammad Hasibuan[2], Rihan Yuhyi[3]

[1,2,3] Universitas Muhammadiyah Sumatera Utara, Indonesia
Email: anandafadilla009@gmail.com, hasibuanfathihsb3@gmail.com, yyuhi@gmail.com

Article Info

Article History
Received 30-04-2024
Revision 22-05-2024
Accepted 22-06-2024

Keywords:
Astronomy
Islamic Philosophy
Tawhid

ABSTRACT

The study of the role of astronomy and the wisdom of Islamic philosophy in understanding the phenomena of the universe has become an important subject in the dialog between science and religion. Astronomy, with its critical and empirical methods, has provided a deep understanding of the structure and dynamics of the universe. On the other hand, the wisdom of Islamic philosophy, especially through Muslim philosophical thought, offers a deeper perspective on the meaning and purpose behind the phenomena of the universe. It provided a conceptual framework for understanding the universe. Concepts such as tawhid (the oneness of God), fitrah (nature), and 'ilm al-kalam (the science of theology) help in explaining the essential relationship between creator and creation. In addition, Muslim philosophical thought also highlights the ethical and moral aspects of man's relationship with the universe. The integration of astronomy and Islamic philosophical wisdom brings great benefits in deepening man's understanding of the universe and his place in it. This integration not only enriches intellectual insights but also expands the spiritual dimension of man. Conceptual analysis method to be able to analyze key concepts in astronomy and Islamic philosophy, such as tawhid, fitrah, and hikmah, to understand how they interact with each other and contribute to human understanding of the universe.

I. Introduction

Since ancient times, humans have looked up at the night sky with awe and curiosity. Observations of the motion of the stars and planets have been the basis for the development of astronomy. Meanwhile, in the Islamic intellectual tradition, philosophical thinking has been a vehicle for deepening understanding of the meaning and purpose behind the phenomena of the universe. The combination of astronomy and Islamic philosophical wisdom through Muslim philosophical thought provides a solid foundation for the study of the universe that includes physical, spiritual, and metaphysical aspects. In this context, astronomy gives us a deep understanding of the structure of the cosmos, planetary motion, and other astronomical processes. Through methods of observation, measurement, and data analysis, astronomy leads us to a deeper understanding of the vast complexity of the universe [1].

The wisdom of Islamic philosophy provides a spiritual and moral dimension to the universe. Concepts such as tawhid (the oneness of God), fitrah (nature), and 'ilm al-kalam (the science of theology) form an important conceptual framework for understanding the relationship between creator and creation. Muslim philosophical thought invites us to reflect on the purpose and meaning behind the existence of the universe and humanity's place in it [1].

By integrating astronomy and Islamic philosophical wisdom through Muslim philosophical thought, we can deepen our understanding to the universe holistically. This approach not only enriches our intellectual horizons but also expands the spiritual and ethical dimensions of viewing the reality of the universe. Therefore, the role of astronomy and Islamic philosophical wisdom in understanding the phenomena of the universe has an important relevance in human efforts to explore the meaning and purpose of our existence in this vast cosmos.

Understanding the universe has been the focus of human attention since ancient times. In this context, astronomy and Islamic philosophy play an important role in providing deep insights into the phenomena of the universe. Astronomy allows humans to observe, analyze, and understand the motion and behavior of celestial bodies such as planets, stars, and galaxies. Through rigorous research, astronomy helps us understand the structure and evolution of the universe. In the context of Islamic philosophy, Muslim philosophers have made significant contributions to the understanding of natural phenomena. This thinking is reflected in the concept of tawhid (oneness of God) in Islam, which states that the universe is manifestation of the power of the Almighty God. In addition, through the thinking of Muslim philosophers, there is an attempt to combine astronomy with the principles of Islamic philosophy [1]. They try to explain the phenomena of the universe by using a framework of thought that is following Islamic teachings, such as the concepts of tawhid, sunnatullah (God's sunnah in the universe), and qadar (God's decree). One of the wisdoms of Islamic philosophy in understanding the phenomena of the universe is the encouragement to explore and understand the universe as part of worship to Allah. In Islam, scientific knowledge is seen to get closer to the Creator, because understanding His work is a form of exaltation and

respect. Muslim philosophers also highlighted the importance of ethics in the use of astronomical knowledge. They taught that scientific knowledge should be used for the good of humanity and the welfare of mankind, not for personal gain or harming others [2].

II. Method

The research method used in this study is the literature analysis research method which involves the study of classical and contemporary texts in astronomy, Islamic philosophy, and Muslim philosophical thought to identify concepts and theories relevant to the understanding of the phenomena of the universe. The conceptual analysis method is to be able to analyze key concepts in astronomy and Islamic philosophy, such as tawhid, fitrah, and hikmah, to understand how they interact with each other and contribute to human understanding of the universe. This method is a broad study and for use in various fields on the discussion of a theory that departs from objective knowledge assumptions and is then written in various sources of information. The sources of information that the author sources are from journals and books.

III. Results and Discussion

Muslim philosophers also remind us of the limitations of human knowledge in understanding the universe. Although astronomy has brought humans to a deeper level of understanding of the universe, there are still many mysteries. This teaches humans to remain humble and not to be arrogant about their knowledge. In this context, astronomy and Islamic philosophy can also be a source of inspiration for the development of modern science and technology. Through deep philosophical thinking, humans can develop new theories and technologies that can help in further understanding and exploration of the universe. However, it is important to remember that astronomy and Islamic philosophy are not the only approaches to understanding the phenomena of the universe [1].

The role of astronomy and the wisdom of Islamic philosophy in understanding the phenomena of the universe is very important. Astronomy provides a more technical understanding of the motion and behavior of celestial bodies, while Islamic philosophy provides a spiritual and ethical dimension [3], both of which can lead humans to a more holistic and in-depth understanding of the universe and its meaning in human life. Here's how astronomy plays a role in understanding the phenomena of the Universe:

A. Understanding the Origin and Fate of the Universe

I. The origin of the universe: The most dominant theory in explaining the origin of the universe is the Big Bang Theory [3]. This theory states that the universe began as an extremely dense and hot singularity about 13.8 billion years ago. At that moment, the universe exploded and began to expand. During this initial phase of expansion, energy, matter and space-time were formed.
Evidence for the Big Bang Theory, namely
- Cosmic Microwave Background Radiation (CMB)

According to the Big Bang Theory, the CMB originated at the very beginning of the universe, about 380,000 years after the Big Bang. By then, the universe had expanded and cooled so that electrons could combine with atomic nuclei, forming neutral atoms. This allowed light to travel long distances unhindered by interactions with charged particles [4].

- Abundance of light elements

The abundance of light elements in the context of the Big Bang Theory refers to the proportion of light elements such as hydrogen, helium and lithium in the early universe. The Big Bang Theory predicts that in the early stages of the universe's development, temperature and density were so high that primary nuclear reactions occurred, resulting in the formation of simple elements. The process of formation of light elements are

Nuclear Synthesis: In the early phase of the universe, about 1 to 3 minutes after the Big Bang, the temperature and density were so high that primary nuclear reactions could occur. These reactions, known as primary nucleosynthesis, took place as the temperature dropped to about a billion degrees Kelvin.

Hydrogen and Helium Dominance: During this phase, the amount of hydrogen and helium increases significantly due to nucleosynthesis, while the amount of heavier elements such as lithium and other heavy elements remains relatively low [5].

II. The fate of the universe;

The fate of the universe is a topic that is still debated and studied in astronomy. Some of the main scenarios proposed for the fate of the universe are as follows:

- Big Freeze (Heat Death): In this scenario, the universe continues to expand until the temperature of the universe reaches absolute zero. As a result, all physical activity would cease, causing a "heat death" where no energy is available to do mechanical work.
- Big Crunch: In this scenario, gravity finally overcomes the expansion of the universe and begins to reverse its direction. The universe would then experience "compression" back to the point of singularity, resembling the initial conditions before the Big Bang.
- Big Rip: In this scenario, the dark pressure or dark energy believed to be responsible for the accelerated expansion of the universe would become so strong that it would rip apart galaxies, stars and the basic matter of the universe itself sendiri [6].

B. Understanding the Movement of Celestial Bodies

- Rotational and Revolutionary Motion

Rotational Motion: Refers to the rotation of objects around their axes. For example, the earth's rotation causes the alternation of day and night.
Revolutionary Motion: Refers to the motion of an object around another object in orbit. For example, the Earth orbits the Sun, while the Moon orbits the Earth.

- Planetary Motion
  Retrograde Motion: Sometimes, planets appear to move backward in the sky before resuming their forward motion. This is called retrograde motion, which is caused by the difference in the orbital speeds of the planets and the Earth.
  Conjunction and Opposition: Conjunction occurs when the planet and the Sun are on the same side of the Earth, while opposition occurs when the planet and the Sun are on opposite sides of the Earth.
- Star and Galaxy Motion
  Star Motion: Stars appear to move in the sky due to the Earth's motion throughout the year. This motion is relative to the background of other stars.
  Galaxy Motion: Galaxies also move through the Universe. On a large scale, galaxies interact with each other through gravity.
- Celestial Motion
  Daily Motion: Occurs due to the rotation of the earth. Celestial objects appear to rise and set in the sky throughout the day.
  Monthly Motion: Occurs due to the Moon's revolution around the Earth. The Moon appears to move in the sky from east to west every night.
  Annual Motion: Occurs due to the Earth's orbit around the Sun. The stars appear to move in the sky throughout the year.

C. Philosophical Interpretation of the Universe

Islamic philosophy teaches that the universe is proof of the majesty and wisdom of Allah [7]. Understanding the universe can bring humans closer to Allah SWT, because through this knowledge, humans can admire and respect His creation. Here are some philosophical concepts that are often used to interpret the universe [8]:

- Ontology: Ontology is a branch of philosophy that studies the nature of existence. In the context of the universe, ontology addresses the fundamental questions of what exists, how existence is defined, and whether there is a fundamental origin or substance upon which the universe is based.
- Epistemology: Epistemology is the study of the nature, origin, and limits of knowledge. In the context of the universe, epistemology includes questions about how we gain knowledge of the universe, whether that knowledge is trustworthy, and whether there are limits to human knowledge of the universe.

- Cosmology: Cosmology is the study of the origin, structure, and evolution of the universe as a whole. Within this framework, philosophical cosmology attempts to answer the questions of how the universe came into being, whether there is a purpose or direction in its development, and whether there is meaning in the universe's existence.
- Teleology: Teleology is the study of the purpose or end of an entity or process. In the context of the universe, the concept of teleology is used to consider whether there is a purpose or design behind the structure and evolution of the universe, and whether there is an intelligence or plan behind it.
- Metaphysics: Metaphysics is a branch of philosophy that deals with the nature of reality, including the nature of the universe. Metaphysical thinking about the universe includes concepts such as existence, consciousness, time, space, and the relationship between parts and the whole.
- Ethics: Ethics addresses questions of value, purpose, and right or wrong actions. In the context of the universe, ethical considerations may include how we should treat the universe.

D. Science as Worship

Science as Worship links efforts to understand the phenomena of the universe with spiritual and moral values in certain religions, especially Islam. This idea underlines that human efforts to gain knowledge about the universe are not only an intellectual act but also a form of worship or devotion to God. The following Science as Worship can be applied to understanding the phenomena of the universe [8]:

I. Respect for the Creator
   In the Islamic context, studying the universe and the phenomena within it is considered a form of respect and appreciation for Allah as the Creator. By expanding knowledge of His creation, man shows recognition of the majesty and wisdom of Allah.
II. Development of Potential
   Islam teaches that humans are given reason and intelligence by Allah to use in understanding the universe. By using that mind and intelligence to explore the universe, humans are utilizing the gifts given by Allah, and such use is considered a form of worship to Allah.

E. An understanding of Tawhid, or the oneness of God

This understanding has profound implications for understanding the universe in the context of Islam. Tawhid is a fundamental concept in Islam that states that Allah is the only God who has no partners, is undivided, and cannot be compared to anything. In the context of

understanding the universe, Tawhid guides us to see everything in creation as a manifestation of one divine existence that has infinite power, wisdom, and dominion.

The understanding of Tawhid impacts the understanding of the universe: [9].

- Recognition of the Existence of God: The concept of Tawhid emphasizes that everything in the universe exists because of the will of Allah. Every natural phenomenon, from the simplest to the most complex, is seen as a sign of Allah's existence and power. This leads to the understanding that the universe itself is proof of Allah's existence.
- Order and Harmony: In the understanding of Tawhid, the universe is understood as a manifestation of Allah's divine wisdom and plan. Everything in the universe works in orderly harmony, demonstrating the infinite wisdom and planning of the Creator. This includes the laws of nature, the cycle of life, and the overall orderliness of the cosmos.
- Dependence on Allah: The understanding of Tawhid also teaches that the universe and everything in it is dependent on Allah. Nothing stands alone or has independent power everything is in existence because of Allah's will and power. Therefore, an understanding of Tawhid encourages us to respect and appreciate the diversity of the universe, including various life forms, ecosystems and other natural phenomena.
- Human Responsibility: In Islam, the understanding of Tawhid also reinforces the concept of human responsibility as khalifah or Allah's representative on earth. Humans are given the power and wisdom to care for and maintain the universe in accordance with Allah's will. Therefore, humans have a moral responsibility to care for the environment and maintain ecological balance as a form of respect for God who created the universe.
- Understanding of Order and Justice: In the understanding of Tawhid, the universe is seen as a mirror of God's wisdom and justice. Observation of the orderliness of the universe, including natural cycles and physical laws, inspires awareness of His wisdom and decree. It also inspires humans to seek justice in social and environmental interactions, in line with the principles reflected in the universe created by Allah.
- Deepening Awe and Devotion: An understanding of Tawhid not only deepens awe of Allah's greatness manifested in the universe, but also strengthens a sense of devotion to Him. Observing the beauty and complexity of the universe becomes a means of drawing closer to Allah and increasing awareness of man's absolute dependence on Him.

1. Al-Biruni (973-1048 M)

Figure 1. Al-Biruni (Left) and Ibn Sina (Right)

Abu Rayhan al-Biruni (figure 1, Left) was an astronomical thinker who lived in the 11th century. He came from Persia and was known as a versatile scientist who had great contributions in various fields, including astronomy. Al-Biruni conducted extensive and in-depth research in astronomy. He observed and measured the positions of the stars, planetary movements, and other phenomena. One of his most famous works is "Kitab Al-Qanun Al-Mas'udi". This work discusses various astronomical topics such as planetary motion, lunar circulation, and stargazing. Al-Biruni used scientific and mathematical methods to explain the phenomena of the universe. This work not only made an important contribution to the development of science in his time, but also influenced the development of science in the western world through its translation and dissemination. Al-Biruni was an astronomical thinker who was very influential in the development of science. His work includes not only accurate observations and measurements, but also important theoretical contributions in understanding the universe.

2. Ibn Sina (980-1037 M)

Ibn Sina (figure 1, right) was a Muslim polymath who played an important role in the history of science. In addition to his work in medicine, Ibn Sina also made major contributions in philosophy, astronomy, and mathematics. In his famous work, "Kitab al-Shifa" (The Book of Healing), Ibn Sina discussed the concepts of astronomy and physics. He explored ideas about the universe, planetary motion, and the nature of matter. Ibn Sina also introduced the concept of equilibrium motion, which became the basis for the understanding of planetary motion in the universe [11].

3. Ibn al-Haytham (Alhazen)

Abu Ali al-Hasan ibn al-Hasan ibn al-Haytham (965-1040 M), better known as Ibn al-Haytham in figure 2 on the left, was a leading Muslim scientist in optics, mathematics, and physics. His understanding of the nature of light and vision also impacted the understanding of the universe, especially in the context of astronomy. One of his famous works, "Kitab al-Manazir" (The Book of Optics), was an important contribution to the understanding of optics and astronomy in his time [12].

4. Nasir al-Din al-Tusi

Figure 2. Ibn Al-Haytam (Left) and Nasir Al-Din al-Tusi (Right)

Nasir al-Din al-Tusi (1201-1274 M) was a 13th century Muslim scientist known for his work in mathematics, astronomy, and philosophy shows in figure 2 on the right. He led the construction of the leading scientific observatory in Maragha, Iran, which became the center of astronomical and mathematical research in his time. His works in astronomy, including "Tahrir al-Majisti" (Commentary on the Almagest), helped advance the understanding of the universe [13].

5. Al-Khwarizmi (Algorithm)

Figure 3. Al-Khawarizmi

Muhammad ibnu Musa al-Khwarizmi (780-850 CE) was a 9th century Muslim mathematician, astronomer, and geographer. One of his famous contributions was the introduction of the concept of algebra and the Hindu-Arabic numeral system. Although he is best known in mathematics, his works also cover the field of astronomy. In his work entitled "Al-Majisti", al-Khwarizmi discusses astronomy and scientific calculations, which provide a deeper understanding of the universe and the movement of celestial bodies [14].

To explain the phenomena of the universe, these scientists used mathematical and scientific methods, including planetary motion, the nature of light, and the circulation of other celestial bodies. They also formulated theories that were important in understanding the universe, such as the concept of equilibrium motion introduced by Ibn Sina.

IV. Conclusion

Astronomy and Islamic hagiography give important lessons and Astronomical knowledge imparts about the periodic table and its structure using critical and empirical methods. The primary source of Islamic philosophy found in another Muslim discipline offers a more critical perspective on the goals and nature of the periodic table. The collaboration between astronomy and Islamic philosophy develops our understanding of the universe. This does not only influence intellectual capacity, but it also influences human spiritual dimensions. Through this integration, humanity can understand the universe in its entirety, including both spiritual and physical aspects. Hikmah philosophy Islam, mainly through Muslim intellectual contributions abroad, has provided a moral and spiritual dimension to the study of the world. Concepts like tawhid, fitrah, and knowledge al-kalam have formed important conceptual conditions that highlight the primary relationship between creator and creation.

Besides that, Islamic philosophy emphasizes the importance of ethics in the application of astronomy knowledge and predicts a decline in human understanding of the universe. The joint efforts of astronomy and Islamic philosophy have yielded significant benefits in helping people understand the nature of the universe. Through this holistic approach, humanity can transcend itself not only as a physical object but also as a manifestation of the will and mercy of Allah SWT. This strengthens human intellect while also strengthening moral and spiritual dimensions in governing cosmic reality.

Several of the most eminent Muslim scholars, such as Al-Biruni, Ibnu Sina, Ibnu al-Haytham, Nasir al-Din al-Tusi, and Al-Khwarizmi, are also mentioned. Their contributions to scientific knowledge, particularly in the field of astronomy, have had a significant impact on the advancement of human understanding of space exploration. In general, the relationship between astronomy and Islamic philosophy as expressed in Muslim philosophy has important implications for humankind's efforts to understand the nature and purpose of our limited existence. With it being said

References

[1] Muhammad Nur Hadi and Achmat Mubarok, "Hakikat Alam Semesta, Dan Peran Manusia Sebagai Kholifah Di Alam Semesta," *J. Mu'allim*, vol. 3, no. 2, pp. 146–160, 2021, doi: 10.35891/muallim.v3i2.2651.

[2] T. Rachman, *Filsafat Ilmu Pengetahuan*. 2018.

[3] M. Hendra and M. Rezi, "Konsep Penciptaan Bumi dalam al-Qur ' an (Studi dalam Tafsir al-Azhar," *J. Secr.*, vol. 9, pp. 91–120, 2021.

[4] E. P. Wirman, "Hukum Alam dan Sunnatullah: Upaya Rekonstruksi Pemahaman Teologis di Indonesia," *Ilmu Ushuluddin*, vol. 1, no. 4, pp. 347–362, 2012.

[5] Ade Jamarudin, "Fiqhul Ta'amul ma'al Walidain, Asy Syaikh Al Muhaddist Musthofa Al 'Adawi hafizhahullah," *J. Ushuluddin*, vol. 16, no. 2, pp. 136–151, 2010.

[6] M. Soleh Ritonga, "Penciptaan Manusia," *FITRAHJurnal Kaji. Ilmu-ilmu Keislam.*, vol. 4, no. 1, p. 1, 2018, doi: 10.24952/fitrah.v4i1.873.

[7] I. Iqbal, "Filsafat sebagai hikmah: Konteks berfilsafat di dunia islam," *Refleks. J. Filsafat dan Pemikir. Islam*, vol. 17, no. 1, pp. 23–42, 2017, doi: 10.14421/ref.v17i1.1870.

[8] M. S. Ritonga, "Alam Semesta Dalam Pandangan Filosofi Islam Dan Ahli Tafsir," *Alashriyyah*, vol. 4, no. 2, pp. 12–12, 2018.

[9] A. Mannan, "Transformasi Nilai-Nilai Tauhid Dalam Perkembangan Sains Dan Teknologi," *Juornal Aqidah*, vol. IV, no. 2, pp. 252–268, 2018.

[10] S. Rianti and A. M. Munawar, "Penciptaan Alam Semseta Menurut Para Muffasir dan Astronom," *Konf. Integr. Interkoneksi Islam dan Sains*, vol. 4, no. 1, pp. 19–27, 2022.

[11] N. Aini, "PROSES PENCIPTAAN ALAM DALAM TEORI EMANASI IBNU SINA," vol. 3, no. 2, pp. 55–75, 2018.

[12] M. S. Alias, "Kesepaduan Elemen-elemen Asas Dalam falsafah Sains Ibn Al-Haytham," *Ulum Islam. J.*, vol. 13, pp. 39–53, 2014.

[13] T. Yazofa, I. Harahap, Adenan, J. Hasibuan, D. Pulungan, and M. Zaid Rusdi, "Pemikiran Nasiruddin Al-Thusi tentang Filsafat Islam," *J. Pendidik. Tambusai*, vol. 7, no. 1, pp. 2398–2410, 2023.

[14] M. H. Yahaya, "Alam Semesta Dan Bencana Alam Dari Perspektif Agama Dan Sains," *Unimap*, vol. 1, pp. 71–85, 2012.