
EPISTEMOLOGICAL INTEGRATION OF HISAB AND RUKYAT IN THANTAWI JAUHARI'S SCIENTIFIC EXEGESIS

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Abstrak

Perbedaan penetapan awal bulan Hijriyah di Indonesia mencerminkan perbedaan epistemologis antara metode hisab dan rukyat yang sering diposisikan secara dikotomis. Namun, kajian sebelumnya umumnya masih menempatkan integrasi keduanya pada tataran fiqh praktis dan belum secara spesifik mengonstruksi relasi epistemologis antara konsep *ḥusbān* dan *ahillah* dalam Al-Qur'an. Penelitian ini bertujuan menganalisis konstruksi epistemologis hisab dan rukyat dalam kerangka tafsir 'ilmi Tantawi Jauhari terhadap QS. Yunus:5 dan QS. Al-Baqarah:189. Penelitian ini menggunakan metode kualitatif kepustakaan dengan pendekatan tafsir 'ilmi, melalui analisis deskriptif-analitis terhadap sumber tafsir dan literatur ilmiah terkait. Hasil kajian menunjukkan bahwa dalam perspektif Tantawi Jauhari, *ḥusbān* merepresentasikan keteraturan dan presisi perhitungan kosmik yang bersifat rasional, sedangkan *ahillah* menunjukkan dimensi empiris berupa visibilitas hilal sebagai penanda waktu ibadah. Kedua konsep tersebut tidak bersifat oposisional, melainkan membentuk sistem epistemologis yang integratif. Temuan ini memberikan kontribusi pada penguatan kerangka teoretis integrasi wahyu dan sains dalam tafsir, serta memberikan pijakan konseptual bagi pengembangan model penentuan awal bulan Hijriyah yang lebih koheren dan dialogis antara hisab dan rukyat.

Kata kunci: Tafsir Ilmi; Hisab; Rukyat; Epistemologi Islam; Tantawi Jauhari; Kosmologi Al-Qur'an; Kalender Bulan.

Abstract

The differences in determining the beginning of the Hijri month in Indonesia reflect epistemological distinctions between the methods of *hisab* (astronomical calculation) and *rukya*t (crescent observation), which are often positioned dichotomously. However, previous studies have generally addressed their integration at the level of practical fiqh and have not specifically constructed the epistemological relationship between the concepts of *ḥusbān* and *ahillah* in the Qur'an. This study aims to analyze the epistemological construction of *hisab* and *rukya*t within the framework of scientific exegesis (*tafsir 'ilmi*) by Tantawi Jauhari on QS. Yunus:5 and QS. Al-Baqarah:189. This study employs a qualitative library approach using *tafsir 'ilmi*, with data analyzed descriptively and analytically based on classical and contemporary tafsir as well as relevant scientific literature. The findings reveal that, in Tantawi Jauhari's perspective, *ḥusbān* represents the order and precision of cosmic calculation, while *ahillah* reflects the empirical dimension of crescent visibility as a marker of religious time. These two concepts are not oppositional but form an integrated epistemological system. This study contributes theoretically to strengthening the integration of revelation and science in Qur'anic exegesis and offers practical implications for developing a more coherent and dialogical model of determining the Hijri calendar through the integration of *hisab* and *rukya*t.

Keyword: Scientific Exegesis; Hisab; Rukyat; Islamic Epistemology; Tantawi Jauhari; Qur'anic Cosmology; Lunar Calendar.

INTRODUCTION

The difference in the determination of the beginning of the Hijri month in Indonesia is a recurring phenomenon that has an impact on the inconsistency in the implementation of Islamic holidays, especially Eid al-Fitr and Eid al-Adha. This condition is triggered by the methodological dichotomy between the use of *rukayat* embraced by Nahdlatul Ulama and the government, and the hisab method of *wujudul hilal* applied by Muhammadiyah (Wahyudi, 2025). This polarization often emerges in the *itsbat* session and results in the initial determination of different Ramadan and Shawwal, thus causing confusion in the community. The urgency of the Single Hijri calendar is increasingly urgent to maintain social cohesion and legal certainty for Muslim worship (Holis et al., 2025). This condition shows that there is no integrative theological-methodological framework in determining the beginning of the month of Qamariyah NF, (2023) which is often complicated by the difficulty of reaching consensus on the criteria for the visibility of the new moon at the national level (Faisal, 2025).

The debate about the determination of the beginning of the Hijri month is not solely related to astronomical technical problems, but is rooted in differences in the epistemological framework in reading the relationship between revelation and cosmic phenomena. The fundamental problem lies in the meaning of QS. Jonah: 5 who affirms the regularity of the circulation of the sun and moon through the principles of *ḥusbān* and QS. Al-Baqarah:189, which explains the function of *ahillah* as a marker of the time of worship, is not actually in a contradictory relationship with each other (Koto et al., 2024). However, previous studies have tended to discuss the two verses separately without constructing an epistemological synthesis that integrates cosmic calculations and *hilal* visibility in one integrated conceptual framework. This research gap shows that there has not been a model of reconciliation that is able to equalized *husbān* and *ahillah* as a complete epistemological system (Ilham, 2024). This pattern of partial understanding gives birth to a sustained methodological difference between *hisab* and *rukayat*, thus showing the lack of an integrated conceptual framework that integrates cosmic calculations and *hilāl* visibility in a single consistent mechanism for determining the timing of worship (Hasan, 2023).

To answer this problem, this study explores the perspective of *Tafsir Ilmi Thantawi Jauhari* through his monumental work *Al-Jawāhir fī Tafsīr al-Qur'ān al-Karīm*. Tantawi Jauhari places natural phenomena as part of a cosmic system that is subject to the laws of order and can be studied scientifically. This interpretation offers an integrated framework that places science not as a threat, but as an explanation for the miracles of the verses of the Qur'an (Khairuddin, 2024).



Although a number of studies have discussed the integration of science and revelation in their interpretations, they have not specifically constructed the relationship between *husbān* and *ahillah* as the epistemological basis for the integration of hisab and rukyat. Moreover, Thantawi's idea of the order of the universe provides a solid foundation for the rationalization of the *hisab* method (Muhammad, 2022). This perspective is relevant for studying QS. Jonah:5 as a representation of the principles of cosmic order and calculation and QS. Al-Baqarah:189 as a marker of the empirical phenomenon of hilal.

A number of recent studies have discussed the issue of determining the beginning of the month of Qamariyah from various points of view. Yunus & Muhammad (2025), "Harmonization of *Hisab* and *Rukyat* in the Determination of the Beginning of the Hijri Month" concluded that QS. Al-Baqarah: 189 about *ahillah* as mawaqit emphasizes the function of hilal as a marker of time that requires the integration of observation and calculation. Other studies, Nasir et al., (2024), *Hisab Rukyat in the Light of the Quran and Sunnah* emphasized that QS. Jonah: 5 explicitly mentions the phrase "*al-hisab*" as an instrument of calculating time based on the manazil of the moon and the sun. Afifi & Abbas (2022), *Moderate way Implementing Rukyah and Hisab to Determine in Ramadan* concludes that a moderate approach that integrates both methods is an inclusive solution in contemporary fiqh discourse. Adding to this, research on the implementation of new criteria shows that changes in astronomical standards require support for a more dynamic interpretation of interpretation (Farras et al., 2025). Based on this analysis, the previous study was partial, non-integrative, and did not focus on Tantawi Jauhari's Tafsir specifically, thus opening up space for this research.

This research is here to fill this gap with the aim of examining and reconstructing the conceptual understanding of hisab and rukyat through the analysis of Tantawi Jauhari's scientific interpretation of QS. Yusuf: 5 and QS. Al-Baqara: 189. This research is focused on trying to explain the epistemological relationship between the principle of regularity and cosmic calculation (*husbān*) and the phenomenon of hilal visibility (*ahillah*) as two concepts that complement each other in determining the beginning of the month of Qamariyah. The formulation of the problem in this study is how Tantawi Jauhari's interpretation of QS. Jonah: 5 and QS. Al-Baqarah:189 in the framework of the interpretation of science, how the concepts of *husbān* and *ahillah* are understood in the commentary, and how the integrative theoretical construction between *hisab* and *rukkyat* can be formulated. Thus, this research is expected to make a theoretical contribution in the form of an integrative framework of interpretation of the Qur'an in understanding *hisab* and *rukkyat*, as well as becoming a conceptual reference for the development of a more comprehensive discourse on determining the beginning of the month of Hijri.

METHODS

This research uses a qualitative approach based on library *research* with a thematic interpretation approach (*maudhu'i*) combined with an *'imi* tafsir approach. This design was chosen to examine the conceptual relationship between *husbān* and *ahillah* within the framework of the integration of *hisab* and *rukyat* through the analysis of the Qur'anic text and the interpretation of scholars. QS Selection. QS. Yusuf: 5 and QS. Al-Baqarah:189 is based on thematic criteria, namely (1) a verse that explicitly contains the concepts of cosmic calculation (*ḥusbān*) and the appearance of the hilal (*ahillah*), (2) its direct relevance to the Hijri dating system, and (3) its relevance to the discourse of integration between rational and empirical approaches in determining the beginning of the month. Thus, these two verses are positioned as key representations in constructing the epistemology of *hisab-rukyat*.

The data sources in this study are divided into primary and secondary sources. Specifically, in this study, it borrows an interpretation from Tantawi Jauhari in the book of *Tafsir Jawāhir* to analyze data. The primary source in this study is in the form of the text of the Qur'an (QS. Jonah: 5 and QS. Al-Baqarah:189) as the main object of analysis, as well as classical and modern tafsir books such as *Tafsir Jawāhir* by Tantawi Jauhari as the main basis of tafsir 'ilmi, *Al-Taḥrīr wa al-Tanwīr* as a representation of rational-linguistic interpretation, and *Al-Jāmi' li Ahkām al-Qur'ān* as a fiqh-style commentary. In addition, linguistic books such as *Lisān al-'Arab* and *Al-Mufradāt fī Gharīb al-Qur'ān* are used to trace the lexical and semantic meanings of key terms. The secondary sources include academic books, indexed scientific journal articles, and astronomical literature that functions as a reinforcement of contextual analysis related to the integration of *hisab* and *rukyat*. The criteria for selecting sources are based on scientific authority, topic relevance, and direct relevance to the theme of the Hijri calendar and the interpretation of *'ilmi*.

The data analysis procedure is carried out in a descriptive-analytical manner with systematic stages. First, identify key concepts in the verse, specifically the terms *ḥusbān* and *ahillah*, through linguistic and semantic analysis. Second, the collection and comparison of interpretations from various books of tafsir to see various perspectives, with an emphasis on the interpretation of Tantawi Jauhari as the main analytical. Third, contextualizing the meaning of verses with the approach of tafsir 'ilmi, which is to connect the cosmic concept and the phenomenon of the hilal with the principles of modern astronomy. Fourth, conceptual synthesis to build an epistemological relationship between *hisab* (rational) and *rukyat* (empirical). To maintain the validity of the data, this study uses the source triangulation technique by comparing various interpretations and scientific literature, and documentation is carried out through systematic recording of relevant citations, concepts, and findings to ensure data traceability and analysis consistency.



RESULTS AND DISCUSSION

The Epistemological Relationship of *Husbān* and *Ahillah*

The Earth's rotation event results in the lunar cycle alternating every month. This phenomenon is certainly related to the sun, which is the source of light. One month is the period of time from the appearance of the full moon to the next full moon. This does not allow the number of Qamariah calendars to exceed 30 days. In contrast to the Christian calendar, the rules for dismissal use the calculation of days in a year divided into 12 months (Lajnah Pentashihan, 2013).

The regularity of the lunar cycle and the resulting Qamariyah dating system are not solely understood as astronomical phenomena, but also have a normative basis in the Qur'an. This is reflected in QS. Yusuf: 5 and QS. Al-Baqarah:189, which explains the relationship between the circulation of celestial bodies and the system of determining time (Faid, 2025).

يَسْأَلُونَكَ عَنِ الْأَهْلِ فَلَنْ هِيَ مَوَاقِيْتُ لِلنَّاسِ وَالْحَجِّ وَلَيْسَ الْبِرُّ بِأَنْ تَأْتُوا الْبُيُوتَ مِنْ ظُهُورِهَا وَلَكِنَّ الْبِرَّ مَنِ اتَّقَى وَأْتُوا الْبُيُوتَ مِنْ أَبْوَابِهَا وَاتَّقُوا اللَّهَ لَعَلَّكُمْ تُفْلِحُونَ ١٨٩

Meaning: They ask you (the Prophet Muhammad) about the crescent moon. Say, "It is a time for people and for Hajj." It is not a virtue to enter the house from behind him, but it is a virtue of the pious. Enter the houses from their gates, and fear Allah so that you may be lucky.

هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْحِسَابَ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحِكْمِ يُفَصِّلُ الْآيَاتِ لِقَوْمٍ يَعْلَمُونَ ٥

Meaning: He is the one who makes the sun shine and the moon shine. He is also the one who determines the places of his orbit so that you know the number of years and the calculation (time). God did not create it that way, except correctly. He explains the signs (of His greatness) to those who know.

In *Lisān al-'Arab*, *ḥisāb* is understood as a calculation activity that gives birth to precision and order, as well as being the basis for rational judgment of a matter, both material and non-material. This meaning is not limited to the numerical context, but it also includes proper consideration, sufficiency, and measurement. In line with this, *al-Rāghib al-Aṣḥānī* in *Mufradāt Alfāz al-Qur'ān* affirms that *ḥisāb* refers to the systematic and precise use of numbers. Meanwhile, *ahillah* in *Lisān al-'Arab* is understood as the plural of *hilāl*, i.e. the crescent moon that appears at the beginning of its appearance. The emphasis on the meaning of *ahillah* lies in the aspect of initial visibility as a marker of the entry of a certain time, so that it contains an observational dimension that is closely related to the determination of time and human activity.

The concepts of *ḥusbān* and *ahillah* in the Qur'an represent two interrelated dimensions in the understanding of time and the circulation of celestial bodies. In the tafsir of *Al-Taḥrīr wa al-Tanwīr*, *Al-ḥisāb* in the verse means the calculation that is already known, especially the calculation of the day and month. This determination affirms the Qamariyah calendar as the basis for determining the

Sharia year, which makes it easier for humans to regulate worship, travel, muamalah, and build civilization through the calendar system. This shows that the Qur'an not only acknowledges the existence of a system of calculations, but also gives legitimacy to the use of arithmetical ratios in understanding cosmic time. Thus, *ḥusbān* serves as a rational-scientific basis in the epistemology of Islamic times (Izzi, 2024)

On the other hand, the concept of *ahillah* in QS. Al-Baqarah verse 189 refers to the early stages of the appearance of the moon that can be observed directly by humans. *Ahillah* is placed as an empirical phenomenon that acts as an indicator of time for the implementation of worship and socio-religious activities (Supratama et al., 2024). Ibn Katsir explained that Allah SWT makes *ahillah* (crescent moon/moon appearance) as a sign and time marker for humans to determine the time of worship such as fasting, iddah, and hajj, as well as changing the shape of the moon not as a description of technical astronomy, but as an indicator of time that can be known by humans according to the function of dividing the hijri month. However, when compared to Al-Qurtubi, he added that the function of *ahillah* does not negate the aspect of astronomical order, but rather becomes an empirical manifestation of the cosmic system that Allah has established. This comparison suggests that the caldic mufassirs have hinted at an implicit relationship between observation (*rukyat*) and cosmic structure (*hisab*), although it has not been explicitly formulated as methodological integration (Maratoan et al., 2025)

In Tantawi Jauhari's scholarly commentary, the concepts of *ḥusbān* and *ahillah* are integrated as part of a harmonious cosmic system. Jauhari emphasizes that divine revelation and science complement each other, where natural phenomena such as the movement of the sun and moon reflect the cosmic order that God created with precision (Harahap et al., 2024). With this approach, *ḥusbān* is understood not only as a mathematical calculation, but as a representation of the Divine cosmic law, while *ahillah* becomes a concrete form that can be accessed by human beings through empirical experience (Syarif, 2025).

The integrated interpretation of *ḥusbān* and *ahillah* shows that the difference in *hisab* and *rukyat* stems from variations in methodological approaches to the same astronomical system, not a conflict of principle (Budiwati & Anisah, 2025). The interpretation of science places calculation and observation as two epistemic elements that complement each other, because theory and empirical facts are understood to work reciprocally in building a scientific understanding of natural reality. Thus, *ḥusbān* and *ahillah* are not two separate concepts, but two modes of knowledge in understanding time: *ḥusbān* as a representation of rational cosmic order and *ahillah* as its empirical manifestation. This relationship inherently supports the integration of *hisab* and *rukyat*, as they are rooted in the same ontological system: the order of Allah's creation.



Integrative Theoretical Construction of *Hisab* and *Rukyat* in the Perspective of Scientific Tafsir

Synthesis of scientific interpretation of QS. Yusuf: 5 and QS. Al-Baqarah: 189 shows that the determination of the beginning of the month of qamariyah rests on the integration between the legitimacy of *hisab* as a representation of cosmic order and *rukyat* as an expression of empirical phenomena, not on the methodological opposition of the two (Alfalaah, 2025). The principle of *ḥusbān* describes the precise and measurable order of the circulation of celestial bodies, while *ahillah* represents the empirical aspect of that order that can be observed by humans. Both are understood as one system of knowledge of time that complements each other (Isfihani, 2023). In QS. Yunus: 5, Allah SWT says:

هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْأَسَابِطِ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحَقِّ يُفَصِّلُ الْآيَاتِ لِقَوْمٍ يَعْلَمُونَ

"It is He who makes the sun shine, and the moon shine, and He is the One who appoints the places of its orbits, so that you may know the number of years and the reckoning. God did not create such things by right. He explains the signs (of His greatness) to those who know."

The principle of *ḥusbān* in the above verse describes the precise and measurable circulation of celestial bodies. Meanwhile, the empirical aspect of the order is affirmed in QS. Al-Baqarah: 189:

يَسْأَلُونَكَ عَنِ الْإِهْلَةِ قُلْ هِيَ مَوَاقِيتُ لِلنَّاسِ وَالْحَجِّ

"They ask you (Muhammad) about the crescent moon (*ahillah*). Say, "That is the time for mankind and the Hajj."

The dichotomy between *hisab* and *rukyat* in contemporary practice is more methodological than epistemological. This is because both refer to the same object, namely the circulation of the moon, but with different approaches. *Hisab* uses mathematical models to predict the moon's position, while *rukyat* relies on visual observation to verify its presence. From the perspective of the philosophy of science, this relationship aligns with that between theory and observation, where theory guides observation and observation tests theory.

In Islamic epistemology, *hisab* and *rukyat* represent two ways of knowing the order of the cosmos that originate from revelation. Nature is understood as the Qur'an al-*takwīnī*, which is the manifestation of divine signs that can be read through mathematical ratios or empirical observations, without epistemological contradictions. Thus, the dichotomy that has emerged is due more to a partial normative-fiqh approach than to the epistemological structure of the Qur'an itself.

In astronomy, *hisab* is understood as a rational method that places the moon's motion within the framework of mathematical calculations to determine its astronomical position, while *rukyat* serves as an observational method to ascertain the moon's presence through direct observation on the western horizon at sunset (Kurniawan, 2010). However, the development of modern astronomy shows that

the visibility of the hilal can also be scientifically predicted through certain criteria, thus strengthening the argument that *hisab* and *rukyat* are on the same methodological spectrum (Mohammed, 2024).

From the above description of the concepts of *hisab* and *rukyat* within the framework of *wahyu*, the *hisab-rukyat* dichotomy lacks a strong ontological or epistemological basis in the Qur'an. Rather, they are two complementary approaches to understanding the same cosmic reality. Therefore, the integration of *hisab* and *rukyat* is not merely a practical compromise, but is a logical consequence of the structure of knowledge built by revelation.

Integrative Theoretical Construction: Tafsir Ilmi as a Bridge

The approach to scientific interpretation developed by Tantawi Jawhari in *Tafsir al-Jawahir* integrates the textual understanding of the Qur'an with the scientific knowledge of his time, especially in interpreting *kauniyah* verses. Tantawi believes the Qur'an is a final revelation that is not only historically relevant, but has a depth of meaning that can be linked to modern science (Harahap et al., 2024). In this framework, the *Tafsir ilmi* functions as a bridge that connects the two, by interpreting the verses in a scientific framework without letting go of their normative dimension.

In the framework of the scientific interpretation of Tantawi Jauhari, QS. Yusuf:5 is understood as an affirmation of cosmic order based on the principle of precise calculation. The determination of the sun as the source of light and the moon with its *manzilah* is intended so that humans can rationally know the number of years and the time system. For Tantawi Jauhari, the difference between the lunar and solar systems does not show chaos, but rather the precision of God's creation in regulating the cosmos. This understanding is strengthened by the interpretation of the *Qurṭubī*, which views the verse as legitimizing the orderly circulation of celestial bodies for the sake of regulating the timing of worship and human life. Thus, cosmic order is positioned as the epistemological foundation of time-determination in Islam, which integrates the dimension of revelation with natural reality in a coherent manner.

In determining the beginning of the Hijri month, *hisab* is used to predict the hilal's position and visibility, while *rukyat* serves as empirical verification. This integration can be formulated in a three-stage model: (1) revelation as a normative basis, (2) *hisab* as rational elaboration, and (3) *rukyat* as empirical verification (Sakirman, 2022). This approach is also supported by the development of modern astronomical technology that increases the accuracy of *hisab* and the effectiveness of *rukyat*. From the perspective of scientific interpretation, this development is a form of actualization of the Qur'anic commands to understand cosmic signs rationally and empirically (Ansharullah, 2025).

The main theoretical contribution of this study is the formulation of an integrative paradigm of *hisab-rukyat* based on scientific interpretation, which places



revelation, ratio, and empiricism in one coherent epistemological system. Thus, the interpretation of knowledge is not only a method of interpretation, but also a conceptual framework that is able to bridge methodological differences in religious practice (Daruhadi, 2024). In conclusion, the integration of *hisab* and rukyat is not just a practical compromise, but an epistemological consequence of the Qur'anic knowledge structure that combines cosmic order and empirical experience in a unified system of meaning.

CONCLUSIONS AND SUGGESTIONS

This study confirms that from the perspective of the interpretation of 'ilmi, Tantawi Jauhari towards QS. Yusuf: 5 and QS. Al-Baqarah:189, the concepts of *ḥusbān* and *ahillah* are not in oppositional relations, but form an integrative epistemological structure between the rationality of cosmic calculations and the empiricism of the observation of the *hilal* in the Islamic time system. These main findings show that the dichotomy of *hisab* and rukyat that has been developing is more the result of a partial reading of *kauniyah* verses, rather than a complete reflection of the epistemological framework of the Qur'an. Epistemologically, this study affirms that knowledge of time in Islam is built through the coherence between revelation, ratio, and empirical experience, thus opening up space for methodological integration between astronomical science and sharia norms. The novelty of this research lies in the construction of *the ḥusbān-ahillah relationship* as the basis of the integrative epistemological basis of *hisab-rukya*t, which has not been specifically elaborated in previous studies that tend to discuss integration at the practical level or operational fiqh. Thus, this study not only strengthens the position of the interpretation of 'ilmi as a bridge between revelation and science, but also offers a theoretical contribution to the development of the epistemology of interpretation as well as practical implications for the formulation of a policy for determining the beginning of the Hijri month that is more coherent, dialogical, and based on scientific integration.

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