


The Phenomenon of "Idza Ash-Syamsu Kuwwirat" in Star Evolution Perspective

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Article Info	ABSTRACT
<p>Article History Received 25-11-2025 Revision 15-12-2025 Accepted 24-12-2025</p> <p>Keywords: Star Evolution Asy-Syamsu Phenomena</p>	<p>This study examines the meaning of the phrase "idza asy-syamsu kuwwirat" in QS. At-Takwîr [81]:1 through the integration of classical-contemporary interpretations and modern astronomical findings regarding the evolution of the Sun. An analysis of the tafsir literature shows that mufasir such as Ibn Kathir, Al-Qurthubi, and Ar-Razi interpreted kuwwirat as the loss of light, the folding of shape, and the end of the Sun's cosmic function. Modern figures interpret the verse as a symbol of the death of the Sun's role and the collapse of the order of nature. Eschatological hadiths, such as the rising of the Sun from the west, are also understood as an indication of the disruption of the celestial system before the Apocalypse. From an astronomical point of view, the Sun is estimated to be 4.6 billion years old and will reach the end of its life in about 5 billion years. Models of stellar evolution show that after the hydrogen core is depleted, the Sun enters the red giant phase, shedding its outer layer as a planetary nebula, and leaving behind a white dwarf core. The results show a conceptual correspondence between the meaning of kuwwirat and the final physical processes of the Sun, although the two operate in different epistemological domains. Thus, integrating interpretation and astronomy provides a comprehensive understanding of cosmic dynamics while affirming the potential for harmonizing revelation and science in the study of Islamic cosmology.</p> <p>This is an open-access article under the CC-BY-SA license.</p> 

I. Introduction

The phenomenon of cosmic change has become the focus of study in the Islamic scientific tradition and modern astronomy. The Qur'an presents one of the images of these changes through the words of Allah. At-Takwîr verse 1,

إِذَا الشَّمْسُ كُوِّرَتْ

"Idza asy-Syamsu Kuwwirat", which, according to the mufasir, indicates the disappearance of the sunlight or a drastic change in its physical condition. Classical interpretations, such as the works of Ibn Kathir and al-Tabari, understand the word kuwwirat as the process of being "rolled up", "dimmed", or "dropped", while contemporary interpretations emphasize aspects of cosmic transformation as part of the series of events of the Day of Resurrection [1].



Figure 1. Suns Type G2V

On the other hand, modern astronomy provides an empirical understanding of the structure and evolution of the Sun as a G2V-type main-series star, with a mass of about $1,989 \times 10^{30}$ kg, a radius of 6.96×10^5 km, and a surface temperature of about 5,778 K [2] as shown in Figure 1. The Sun is composed of a core that supports hydrogen-helium fusion, a radiative zone, a convection zone, a photosphere, a chromosphere, and a corona [3]. According to the theory of stellar evolution, the Sun is currently in a stable phase, but is predicted to undergo

significant changes in the next billions of years, including increased luminosity, radius widening by up to 200 times, and entering the red giant stage, before finally shedding its outer layer and turning into a white dwarf [4].

The development of instruments over the last 10 years has enabled more precise modeling of the Sun's evolution. Data from the Solar Dynamics Observatory (SDO) satellite and Gaia, as well as stellar modeling based on the MESA code, provide new insights into the rate of solar mass loss, changes in core composition, and the level of stellar instability leading up to the terminal phase [5]. Recent studies have also shown that the increase in solar irradiation is exponential and is directly related to changes in core density as fusion helium accumulates [6].

Despite significant developments in astrophysics, academic studies linking the verse "Idza asy-Syamsu Kuwwirat" to the Sun's evolutionary model remain very limited. Most research on the relationship between cosmological verse and science is merely descriptive and has not included the latest observational data [7]. In contrast, astronomical research rarely provides analytical space for a revelatory perspective, leaving a scientific gap in the dialogue between religious texts and cutting-edge scientific findings. This condition indicates a research gap: the need to develop an integrative study that compares the linguistic-textual meaning of the verse with a scientifically validated model of stellar evolution [8].

This research is of great significance because it offers an integrative approach that combines classical and contemporary interpretations with modern astronomical findings on the Sun's evolution. This approach aligns with the development of the study of Islamic cosmology, which views revelation and science as complementary sources of knowledge for explaining natural phenomena [9]. This approach is expected to make a new contribution to expanding the scope of the study of the cosmology of the Qur'an and strengthening the epistemological bridge between astronomy and contemporary astrophysics [10]. Thus, this research is expected to expand the study of the cosmology of the Qur'an and strengthen the role of astronomy in facilitating dialogue between revelation and modern science.

II. Method

This study uses a qualitative-descriptive approach, with a comparative analysis of religious texts and modern astronomical data. Primary data in the form of the verse "Idza asy-Syamsu Kuwwirat" (QS. (At-Takwîr: 1) is analyzed using a linguistic-semantic approach, drawing on the commentaries of classical scholars such as al-Tabari, Ibn Kathir, and al-Qurtubi, as well as contemporary commentaries on the Qur'an's cosmology. The analysis of the meaning of the root word kwr and the linguistic context is carried out by referring to Arabic philological literature and etymological dictionaries, so that the meaning of the verse can be comprehensively understood according to the tradition of interpretation. This step ensures that the interpretation of verses remains within the corridor of established Islamic scientific methodology.

Furthermore, the study collected the latest astronomical data on the structure and evolution of the Sun from scientific observations and simulations over the past 10 years, including satellite data from the Solar Dynamics Observatory (SDO) and Gaia DR3, and stellar modeling using MESA. The scientific literature is evaluated through a critical review to ensure consistency with modern astrophysical consensus, particularly regarding mass loss, increased luminosity, and the terminal phase of low-mass stars. The interpretive and astronomical data were then compared through comparative-conceptual analysis to identify the common points and epistemic differences between the perspectives of revelation and science. This approach provides an integrative methodological foundation that maintains scientific objectivity without ignoring the authority of the Qur'anic text.

III. Results and Discussion

Analysis of the interpretation of QS. At-Takwîr [81]:1 shows that the phrase "idza asy-shamsu kuwwirat" is understood by scholars as a symbol of the loss of light and the cessation of the Sun's function as the center of cosmic order. Ibn Kathir associates the word kuwwirat with kawwara, which means "to roll, extinguish, or close," so the verse describes the state in which the Sun's light is eliminated. Al-Qurthubi added that the Sun will be "folded like a turban," symbolizing the loss of its role as the source of life's energy. Fakhruddin Ar-Razi interprets this phenomenon as the destruction of the celestial system due to the loss of the

Sun's role in maintaining the cosmos' balance. Contemporary commentators such as Quraish Shihab and Hamka see this verse as a metaphor for the "death of the Sun's function" that has been sustaining life [11]. The mufasir's interpretation holds that the loss of the Sun's light is a great cosmic sign that signals the end of the natural order [1].

The hadiths about the great sign of the Apocalypse also show a fundamental change in the celestial system. The Muslim history of the rising of the Sun from the west is an indicator of the disruption of cosmic order.

مَنْ تَابَ قَبْلَ أَنْ تَطْلُعَ الشَّمْسُ مِنْ مَغْرِبِهَا تَابَ اللَّهُ عَلَيْهِ

"Whoever repents before the sun rises from the west, Allah will accept his repentance" (HR. Muslim).

Ibn Hajar al-Asqalani and An-Nawawi understood this hadith as an event marking the cessation of the natural pattern that had thus far remained stable. Although it does not explain the physical mechanism, the hadith is thematically in line with the concept of *kuwwirat*, namely the collapse of the Sun's stability as a source of energy and light in the world. This classical understanding holds that, in the scholarly paradigm, the Sun's change at the end of time is a great cosmic phenomenon that humans witness directly.

From the perspective of modern astronomy, the Sun as a G2V-type main-sequence star is about 4.6 billion years old and will experience star death in the next 4.5–5 billion years [12]. Models of stellar evolution show that after the hydrogen in the core is depleted, the Sun enters the sub-giant phase, expands into a red giant, and potentially swallows the orbits of Mercury and Venus, even part of Earth's orbit [4]. After that phase, the outer layers of the Sun will detach to form a planetary nebula, while its dense core turns into a white dwarf, a very dense little star that slowly cools and dims over trillions of years [13].

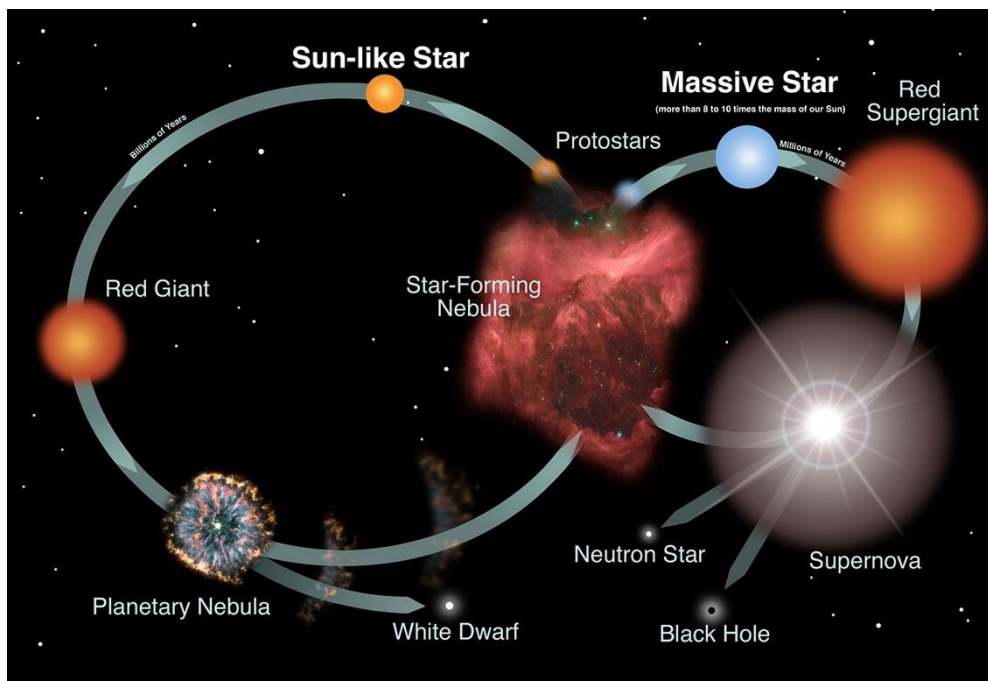


Figure 2. The Death Cycle of a Sun-Like Star

The study of stellar evolution confirms three main characteristics of the Sun's "death" that have thematic correspondence with the concept of *kuwwirat*. First, the loss of energy production, which is the cessation of hydrogen fusion in the nucleus, so that there is no longer a source of light and heat. Kippenhahn and Weigert's research explains that when hydrogen runs out, the Sun's core collapses because it cannot withstand the pressure of gravity [14]. Second, the loss of the gravity-radiation balance. Without the radiation pressure from fusion, gravity dominates, causing the core to collapse while the outer layers expand to the point of extreme expansion, triggering structural instability that destroys the star's configuration [15]. Third, the drastic dimming of luminosity in the white dwarf phase. This object no longer fuses; it only emits the remnants of its heat until it finally becomes a black dwarf, a dark star without light [16].

These three characteristics provide a clear picture that the death of the Sun is not a sudden event, but a gradual process that includes the destruction of energy mechanisms, the collapse of structures, and the extinction of light in line with the phenomenological picture of the Sun as the loss of light and the winding down of the Sun's function. Thus, there is a conceptual intersection between eschatological interpretation and modern astrophysics: both

affirm that the Sun's regularity will one day end, although the contexts of revelation and astronomy are spiritual-eschatological and naturalistic, respectively.

The integration of interpretation and astronomy shows that the description of the Qur'an in the verse "idza asy-syamsu kuwwirat" is phenomenological: it describes how humans witness the loss of sunlight as a sign of the cosmos's destruction. Classical scholars understood it as part of the great apocalypse event, while modern astronomy explained physical mechanisms such as the collapse of radiation pressure, the end of nuclear fusion, and the collapse of stellar nuclei [14]. The distinction of epistemological domains must still be maintained: revelation speaks of eschatological certainty, while astronomy discusses natural processes that can be observed and predicted. However, the two can complement each other, as the study of contemporary Islamic cosmology shows that astronomical phenomena can be understood as part of an orderly and predictable sunnatullah [17].

Thus, the verse ash-syamsu kuwwirat can be understood as a picture of the collapse of the Sun's stability, which is consistent with the modern model of stellar evolution. This integration provides a framework that brings together spiritual meaning and scientific understanding: the stability of the Sun today is God's decree, while its destruction will be part of the cosmic cycle established by the laws of nature.

IV. Conclusion

Research on the phenomena of aphelion and perihelion from the perspective of Islamic cosmology and modern astronomy shows that they are natural astronomical events in the dynamics of the Earth's orbit around the Sun. The variation in the Earth-Sun distance does not have a significant impact on global climate change or worship practices, but instead enriches the understanding that the regularity of cosmic motion is a manifestation of sunnatullah. The integration of the study of revelation and scientific findings shows that the Qur'an has hinted at the regularity of celestial bodies' orbits, a phenomenon later confirmed by astronomy through heliocentric models and modern observations. Thus, integrating religious and scientific texts not only strengthens faith but also provides a rational, empirical, and theological foundation for Muslims to view astronomical phenomena. This research is expected to be a contribution to the literature on contemporary Islamic cosmology, especially

in developing an integrative astronomy paradigm that harmoniously combines the text of revelation, classical studies, and modern observational data.

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