

## VERTICAL COMMUNICATION IN BUILDINGS AND OPPORTUNITIES FOR VERTICAL COMMUNICATION IN UNIVERSE

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### Abstract

Architectural design of space in buildings must ensure connection and communication. This communication can be horizontal and vertical. Horizontal communication in buildings connects spaces in horizontal direction. Vertical communication is very important in architecture in the process of design in different types of buildings, defines connection of the architectural spaces with each other in vertical direction, but also with external environment. There are buildings with high frequency of people, such as shopping malls, museums, football stadiums etc., but there is also a category of buildings in which communication is not so intense, such as individual residential buildings. Vertical communication can be defined also as a way to exchange people and goods between different floors in a architectural space. The group of vertical communication in architecture includes: Stairs, Escalators, Ramps and Elevators.

Recently, there is a curiosity about an interesting question that has been raised, how vertical communication might be like in the universe.

**Keywords:** vertical communication, stairs, space, universe

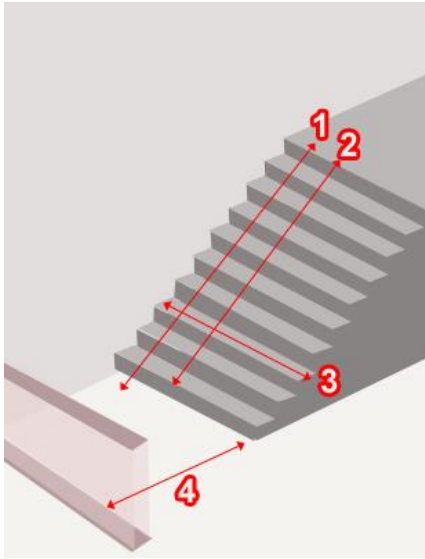
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### Introduction

#### Stairs as an Architectural, Mythological, and Psychological Element

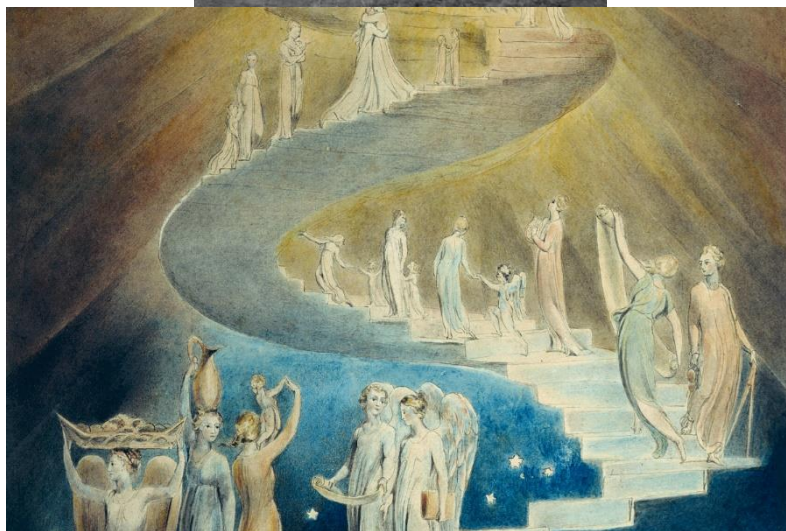
Every type and form of stairs, as a component of vertical communication, enables and allows two opposing movements: ascent and descent. These are not merely physical motions, but also symbolic actions that represent various psychological and spiritual states. Ascent (rising) and descent (falling) hold profound meanings in mythology, religion, and psychology. In Judeo - Christian sacred mythology, for example, the relationship between the realms of good and evil is often expressed through the polarities of "above-below" or "light - darkness." Heaven (paradise) is positioned above - bright and pure, while hell is located below - dark and cold. Within this framework, stairs symbolize the path toward either salvation or damnation, depending on the direction of movement.

A well - known example is Jacob's dream in the Old Testament, where he sees a ladder connecting earth to heaven, on which angels ascend and descend, a clear metaphor for communication between the divine and the earthly, as well as for overcoming the material world to the spiritual.



In Islamic tradition, stairs also hold significant importance as instruments for approaching the sacred. They appear in the form of the muezzin's ascent of the minaret to call the adhan (call to prayer), or the imam's ascent of the minbar during Friday sermons or religious celebrations such as Eid. Although today this practice has been partially replaced by modern technology, microphones and loudspeakers, the symbolism of stairs and upward movement remains enduring. The act of ascending the minbar represents not only a physical elevation but also a symbolic assumption of spiritual authority and responsibility. It signifies the imam's role in guiding the congregation toward ethical conduct, piety, and the righteous path. This vertical movement thus reinforces the connection between spatial elevation and moral or spiritual elevation, highlighting the staircase as a potent symbol within religious ritual and spatial practice.

**Figure 1.** Communication through vertical movement and the spatial dimension of staircases



**Figure 2.** Staircase of minaret (formerly) in a mosque in Gjakova, Kosovo

**Figure 3.** Finding Jesus in the Old Testament: Understanding Jacob's ladder, Stephanie Solberg  
Psychologically, stairs represent personal progress, development, effort, and challenge. They symbolize the path toward self-improvement and transcendence, while simultaneously

embodying the potential for descent, often interpreted as a loss of direction, a fall into vice, or moral failure.

In this sense, stairs are not merely physical structures within architecture but serve as significant symbolic interfaces between the everyday and the sacred, between what is below and what is above, between reality and transcendence. Architecture incorporates and embodies these meanings through both form and function, reminding us that every step we take holds the potential to be more than a spatial movement, it can represent a spiritual, mythical, or self-reflective act.



Figure 4. Man descending stairs, Eadweard Muybridge, (1887)

Figure 5. Guggenheim Museum - New York, USA, Frank Lloyd Wright, (1959)

### Calculation and Design of Stairs in Architecture

The concept of stair calculation is closely linked to the anthropometric dimensions of the human body, particularly stride length. Since stairs are constructed for human use, their dimensions must align with the natural parameters of human gait, ensuring comfort and safety during movement.

The design of stairs must ensure high functionality, accessibility, and safe usage, objectives that are achieved through the appropriate selection of dimensions for each component part of the stair. User comfort and safety depend directly on the angle of inclination, which is determined by the relationship between the riser height (vertical component) and the tread depth (horizontal component).

The most commonly used formula for determining these dimensions is:

- $2R + G = 62 - 64 \text{ cm}$ , where:
  - $R$  is the riser height,
  - $G$  is the tread depth.

This equation, known as **Blondel's formula**, is based on the average human stride and aims to ensure a natural walking rhythm and balance during stair use. By adhering to this principle, architects and engineers can design staircases that are both, efficient and functionally appropriate for a wide range of users.

### Stairs as a Symbol of Vertical Communication in Islamic Tradition: Theological and Conceptual Interpretation

In Islamic tradition, the concept of stairs extends beyond a purely physical or architectural dimension, embodying a profound spiritual and theological significance. This symbolic depth is clearly reflected in the Holy Book of Islam - the Noble Qur'an. Surah Al-Ma'ārij (The Ascending Stairways), indexed as the 70th chapter and composed of 44 verses, contains one of the most direct scriptural references to stairs as instruments of vertical communication between earth and the heavens.

In verse 3 of this Surah, it is stated:

“From Allah, Owner of the Ascending Stairways.” (Al-Ma‘ārij, 70:3)

These “stairways” are described as pathways through which the angels (malā’ika) and the Spirit (Jibrīl) ascend toward the divine:

“The angels and the Spirit ascend to Him in a Day, the measure of which is fifty thousand years.” (Al-Ma‘ārij, 70:4)

This highly metaphysical expression denotes a spatiotemporal dimension that transcends physical reality and human perception. The reference to “fifty thousand years” should not be interpreted solely as a chronological measurement but rather as a symbolic unit expressing the vast distance and profound difficulty involved in the journey toward the Divine Reality.

From both architectural and anthropological perspectives, this verse signifies a vertical communication of metaphysical magnitude, in which the “stairways” represent the bridge between creation and Creator, the earthly and the celestial. In this context, stairs symbolize spiritual ascension and the journey toward perfection. Within sacred architecture, they are not merely structural elements, but powerful symbolic instruments of connection between humanity and the Divine, the profane and the sacred.

In traditional cosmological thought, Earth is often symbolically represented as feminine, while Heaven is conceived as masculine, a symbolic dichotomy that emphasizes the fertility and creative potential of existence. The stairs that unite these two realms represent the harmonious communication and union of opposing principles. From this perspective, sacred architecture constructs stairs not only for physical movement but as a means for spiritual communication and transcendence.

### **Stairs in the Universe (Cosmos)**

The Prophet Muhammad’s journey through the Isra and Mi‘raj represents a clear concept of human communication on both horizontal and vertical planes (horizontal and vertical communication in architecture). According to the Qur’an, during this prophetic journey, Muhammad first travels horizontally, from the Sacred Mosque in Mecca (al-Masjid al-Haram) to the Mosque in Jerusalem (al-Masjid al-Aqsa). This journey symbolizes the terrestrial and spatial connection between sacred sites. Subsequently, he ascends vertically through the seven heavens, experiencing a spiritual journey toward the highest divine realms. This represents a symbolic model of transcending physical and metaphysical dimensions, unfolding the human capacity to communicate with the sacred not only within physically traversable dimensions but also through spiritual and divine experience.

We often relate this topic to another concept that, perhaps in the future, metaphysics will clarify the seven heavens as seven cosmic velocities. Modern science currently recognizes only the first three.

If we move away from Earth and reach the necessary distance to experience the first cosmic velocity, bodies begin to move in circular trajectories at a speed of approximately 7.9 km/s. The second cosmic velocity is about 11.2 km/s and enables an object to escape Earth’s gravitational field into an elliptical trajectory. The third cosmic velocity, around 16.7 km/s, allows an object to escape the gravitational pull of our solar system, proceeding on a parabolic trajectory into intergalactic space.

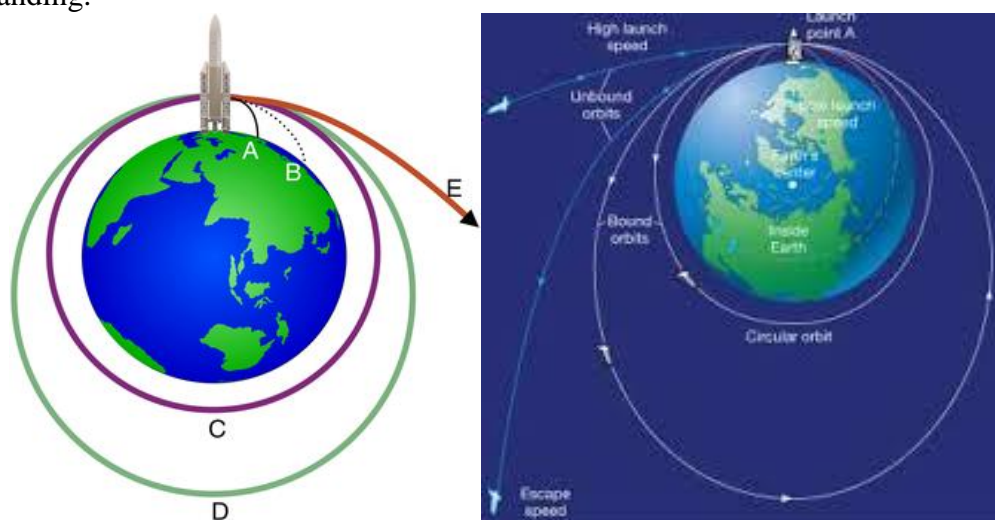
For this reason, communication between Earth and the Moon is complex, and building a spacecraft for this journey requires it to be divided into two parts: the first to stop at Earth’s orbit (first cosmic velocity), and the second to continue toward the Moon and then reunite for return to Earth.

Communication between Earth and Mars is even more challenging. A spacecraft for this journey must consist of three modules: two that stop at the first and second cosmic velocities, and the

third that continues toward Mars. This explains why, so far, only robotic structures have been sent to Mars for recording and analysis, rather than humans.

Therefore, it can be said that the path to God is extraordinarily distant. If we understand this important concept of communication through different levels of existence (or “stairs”), we can also comprehend the metaphor of the “stairs to God.”

This perspective also lends greater meaning to Stephen Hawking’s statement that “Humans are designed to live on Earth”. Perhaps he implied that we are adapted to this environment, and any attempt to transcend the limits of our nature requires not only extraordinary technology but also a deeper metaphysical understanding of existence itself. This statement highlights our physical and natural limitations in the face of a multidimensional reality, emphasizing the significance of the stairs to God as a call to transcend not only physical space but also our ontological understanding.



**Figure 6.** Speed and vertical path of rocket to reach space

In figure 6 is presented the trajectory and the speed of a rocket in order to reach space. If a rocket is launched from the surface of the Earth, needs to reach a sideways speed of about 7.8 km/s, which is known as the orbital velocity. This speed corresponds to a curved path around the Earth, allowing the rocket to maintain a certain altitude without falling back down. This speed of 7.9 kilometers per second is known as the orbital velocity, it corresponds to more than 20 times the speed of sound.

## **Theoretical Interpretations and Implications for Further Studies**

### **Unit of Temporal Measurement:**

The height of the stairs in this context is measured in years rather than meters, suggesting a spatial scale translated into temporal experience, depending on the movement of angels and the nature of existence beyond earthly time.

### **Differentiation of Time and Space:**

Comparing the time described in the Qur'an (50,000 years) with the average human lifespan (approximately 70 years) yields a ratio of roughly 714:1, indicating that ascending these stairs requires an effort or capacity that surpasses human nature.

## **Symbolic Anthropomorphism of Earth and Heaven:**

In traditional literature, Earth is often depicted as a feminine entity and Heaven as masculine. In this context, vertical communication - via the stairs - also symbolizes the connection of creation, fertility, and interaction between two opposing principles.

## **Stairs as an Architectural and Spiritual Metaphor:**

In architecture, stairs symbolize ascension and the striving toward a higher goal. In this sense, the stairs in Al-Ma'ārij can be viewed as an ideal prototype that transcends physical reality and inspires the conceptualization of symbolic structures within sacred architecture.

## **Conclusion and Recommendations for Future Research**

Surah Al-Ma'ārij provides a compelling example of how physical concepts, such as stairs, height, and the duration of ascent, can be appropriated as symbols of metaphysical communication. This example invites analytical research into how spatial and temporal dimensions are interpreted in sacred texts, and how these interpretations may influence the conceptualization of stairs as symbolic elements in sacred architecture and spatial philosophy.

Future research could include:

- Comparative studies of stairs across different religious traditions (Christianity, Judaism, Islam).
- Architectural analyses of stairs in mosques, churches, and temples as representations of vertical communication.
- Investigations into the relationship between spiritual and physical time in sacred texts and sacred architecture.

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