

## Article

# West Asian Art in the Murals of Zhang Shiqing's Tomb: Cultural Selection and Visual Representation in the Context of Local Adaptation

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## Abstract

The Liao Dynasty culture among the northern nomadic peoples absorbed profound West Asian historical heritage and uniquely ingenious artistic essence to enrich its own diversity. These mural paintings of Liao tombs most concentratedly reflect this phenomenon. As a visual medium for cultural integration along the Steppe Silk Roads, their artistic expression profoundly reflects the Liao Dynasty's process of absorbing West Asian art. This article examines the tomb of Zhang Shiqing 张世卿, a former Song subject, now an official of the Liao Dynasty. It employs image analysis alongside interdisciplinary theories from art history, geography, archaeology, and history, aiming to reveal the logic of localized adaptation of West Asian artistic elements—the zodiac signs (Greek: *zōidiakos kyklos*, “circle of animals”; Chinese: 黄道十二宫图) and the curved-neck pipa—within the murals. The article argues that multiple underlying factors within the Liao Dynasty's political-cultural structure, Buddhist propagation, and functional demands drove both the zodiac signs and the curved-neck pipa to exhibit a pattern of knowledge-integration adaptation. This adaptation manifests as juxtaposition and fusion in visual composition, functional integration and recontextualization in spatial arrangement, achieving a creative transformation of West Asian artistic motifs. This process not only revitalized the ritual space of the murals but also represented the inevitable projection of dualistic systems within the cultural sphere of the Liao Dynasty.

**Keywords:** funerary art; death rituals; Liao Dynasty murals; Zhang Shiqing's tomb; West Asian art; local adaptation; selective absorption; visual studies



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## 1. Introduction

As the crossroads where premodern civilizations converged, West Asia served as an essential corridor along the overland trade and cultural exchange networks commonly referred to as the Silk Roads (Zhang et al. 2023; Cui et al. 2019). These plural routes, a term first coined by the German geographer Ferdinand von Richthofen in 1877 and later instrumentalized in various nationalist narratives, connected diverse polities across Eurasia without constituting a single, fixed pathway (Richthofen 1877). From a geographical perspective, two major regions constitute Western Asia: the eastern Mediterranean coastline—historically known as the Levant—stretching from Palestine to the Anatolian Peninsula and the foothills of the Iranian Plateau. Its geographical coordinates span

12°35' N to 43°34' N latitude and 26°16' E to 74°56' E longitude (Figure 1). This study employs the term “West Asia” in its archaeological and art–historical sense, referring to the geographic corridor stretching from the eastern Mediterranean littoral (the Levant) to the Iranian Plateau foothills—the primary conduit for cultural transmission along the Steppe Silk Roads.

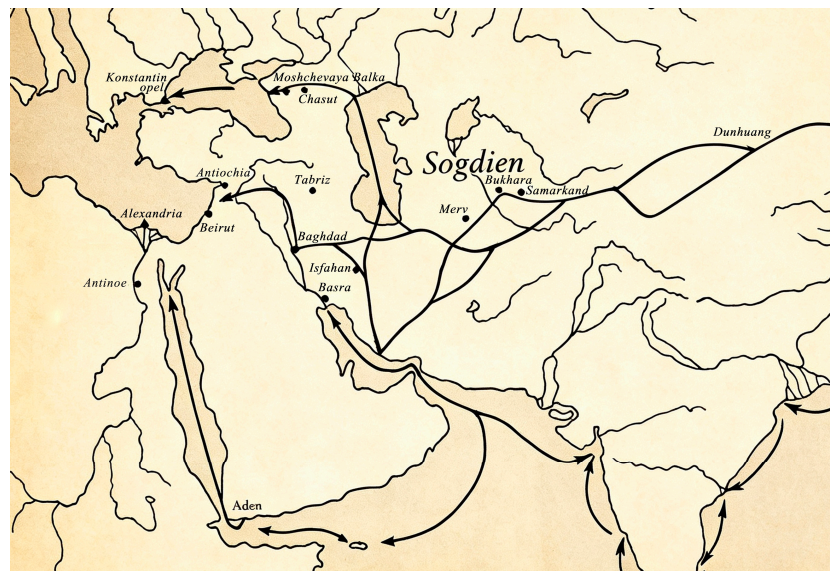


**Figure 1.** West Asia and the Silk Roads Roadmap for the Region.

Tracing the Silk Roads’ trajectory, scholars trace the formal transmission of West Asian culture into China back to 2nd century BCE (Western Han Dynasty). It later reached its peak of prosperity during the Liao Dynasty (907–1125 AD) via the Steppe Silk Roads (Zheng et al. 2026; Marzano 2025). The uninterrupted flow of peoples and ideas enabled the Liao to forge a distinctive cultural identity and visual lexicon; tomb murals constitute the most direct artistic testimony, with the West Asian motifs in the murals of Zhang Shiqing’s tomb standing out as a paramount example (Ding 2024).

The tomb of Zhang Shiqing (1116 AD), a late Liao burial of Song-heritage official status (Song Chinese who came under Liao control), features murals that reflect the multicultural fabric of Liao society, drawing significant scholarly attention. Academic research on this tomb has primarily focused on iconographic analysis, detailed examination of specific elements, painting techniques, and the study of burial artifacts. Li Qingquan 李清泉 and Xia Nai 夏鼐 produced the most representative studies, employing iconographic and typological methodologies (Liu 2019; C. Wang 2022). Li Qingquan examined the mural themes of scattered music and tea preparation, arguing that these two cultural elements entered Liao tombs through ritualistic means, collectively forming a ceremonial virtual space (Q. Li 2005). Xia Nai, meanwhile, conducted a detailed analysis and interpretation of the dissemination of the celestial map depicted on the tomb ceiling, laying the theoretical foundation for this study (Xia 1976). Some scholars have also explored the social issues reflected in the murals.

Although the above studies have conducted in-depth research on the murals in Zhang Shiqing’s tomb, existing research has largely focused on the interpretation of individual images. It has failed to systematically correlate and compare the diverse West Asian artistic elements within the tomb within the broader framework of Liao Dynasty multiculturalism. Furthermore, scholars have not yet explored in depth the underlying unified adaptation patterns and driving mechanisms behind these elements.

Therefore, this paper focuses on the West Asian art elements (the zodiac signs and the curved-neck pipa) in the murals of Zhang Shiqing’s tomb. It explores the knowledge-

integration-based adaptation that these elements exhibit after entering Liao society, specifically how Liao society selected, integrated, and endowed them with new visual forms and symbolic meanings within a multicultural context.

Furthermore, it investigates how multiple factors—including political structures, religious beliefs, and functional demands—interacted to shape this adaptation process. This reveals the underlying logic of West Asian art selection and cultural integration within the Liao Dynasty's multicultural environment, offering valuable insights for studying the interplay between West Asian art and society in Han 汉-Khitans 契丹 tombs of the Liao period.

## 2. Elements: The Selection of West Asian Art

According to archaeological reports and relevant records in the History of Liao, Zhang Shiqing was a local gentry of Song-descended heritage at Xuanhua 宣化, Hebei (the medieval prefecture of Guihua 归化州 and its subordinate county of Qinghe 清河). During the Liao Dynasty, he held official positions including Right Palace Guard. His tomb is located in Xiabali 下八里 Village, Xuanhua District, Zhangjiakou 张家口 City, Hebei Province, China. Situated along the Western Capital Road of Liao and adjacent to the Song-controlled Central Plains 中原, it ranks among the most completely preserved late Liao burials of Song-heritage officials and offers the richest extant mural program in the Xuanhua cluster (Figure 2 and Table 1).



**Figure 2.** A specific geographical location map of Zhang Shiqing's tomb. (a) The Territory of the Liao Dynasty and the Location of Zhang Shiqing's Tomb in China; (b) Xia Bali Liao Tombs Cluster, Xuanhua District, Zhangjiakou City, Hebei Province, China; (c) Plan of Zhang Shiqing's Tomb. Source: (a) Created by the author; (b) (Tao et al. 1990, p. 1); (c) (Q. Li 2008, p. 76).

**Table 1.** Basic information about Zhang Shiqing’s tomb.

| No. | Main Information           | Details                                                                                       |
|-----|----------------------------|-----------------------------------------------------------------------------------------------|
| 1   | Burial date                | The late Liao Dynasty (1116 AD)                                                               |
| 2   | Burial site                | Xuanhua, Hebei Province, China (a southern settlement area under Liao administration)         |
| 3   | Preservation status        | Overall, quite good (with evidence of two looting episodes)                                   |
| 4   | Identity of the tomb owner | Local gentry (officials) of Song-heritage origin serving under Liao administration            |
| 5   | Mural style                | Genre-based narrative mode with secular life themes, executed in regional workshop traditions |
| 6   | Core theme                 | Secular life, astronomy and celestial phenomena, music and tea ceremony                       |

Notably, the tomb’s roof features a hybrid celestial map combining Tang-Song astral conventions with West Asian zodiacal imagery—the earliest fully documented example of its kind in the Liao archaeological record (Q. Li 2008). This map conceals a vast cultural system rooted in West Asia, while the core themes depicted on the tomb’s walls also reveal artistic elements from West Asian traditions.

### 2.1. Cultural Adaptation of the Zodiac Signs in Astrological Charts

The celestial map atop Zhang Shiqing’s tomb blends Eastern and Western elements, and the zodiac signs constitute the Western Asia component in the outermost circle. The zodiacal signs originated in Babylon (southern Mesopotamia, present-day Iraq) as a calendrical-astral framework, were geometrically formalized in Hellenistic Greece (c. 2nd century BCE–2nd century CE), and entered China via Buddhist translation during the Sui-Tang period. The academic community points out, “the theory that the twelve constellations originated in Babylon has become an established academic consensus” (Guo 1931; Rothschild 2018). In the essay “*On the Twenty-Eight Lunar Mansions and the Twelve Zodiac Signs Based on the Astronomical Chart from the Liao Tomb in Xuanhua*”, Xia Nai posits that the zodiac system originated in Babylon, was perfected in Greece, and then transmitted from Greece to India. Later, with the spread of Buddhism, it first appeared in China in the Sui Dynasty (581–618 AD), specifically in the “*Mahāvaiṣṇava Mahāsamghāta Sūtra* 大方等大集经”, which the Indian monk Narendrayas 那连耶舍 (Narendrayas Sui Dynasty) translated. Greek culture shaped the graphic representation of the twelve signs, and Buddhism or other cultural forces could have introduced it to China as early as the Tang Dynasty (Song 2021). Currently, academic consensus leans toward this perspective. Building upon this foundation, this paper conducts a detailed exploration of the localized characteristics of the zodiac diagrams found in Zhang Shiqing’s tomb.

As recorded in Narendrayas’s translation of *The Great Vehicle Mahāyāna Mahāyāna Sun Treasury Sutra, Section Forty-Two: Sun Treasury, Chapter Eight on the Constellations, Part Two* 大乘大方等日藏经 第四十二日藏分中星宿品第八之二:

In the ninth month, the Archer God presides over the month... In the tenth month, the Grinder God presides over the month... In the eleventh month, the Water Vessel God presides over the month... In the twelfth month, the Heavenly Fish God presides over the month... In the first month, the Special Sheep God presides over the month... In the second month, the Special Ox God presides over the month... In the third month, the Twin Birds God presides over the month... In the fourth month, the Crab God presides over the month... In the fifth month, the Lion God presides over the month... In the sixth month, the Heavenly Maiden God presides over the month... In the seventh month, the Weighing God pre-

sides over the month... In the eighth month, the Scorpion God presides over the month... (Figure 3) (Narendra-yas n.d., pp. 91–117).

是九月时，射神主当……是十月时，磨竭之神主当其月……是十一月，水器之神主当其月……是十二月，天鱼之神主当其月……是正月时，特羊之神主当其月……是二月时，特牛之神主当其月……是三月时，双鸟之神主当其月……是四月时，蟹神主当其月……此五月时，师子之神主当其月……此六月时，天女之神主当其月……是七月时，秤量之神主当其月……是八月时，蝎神主当其月……

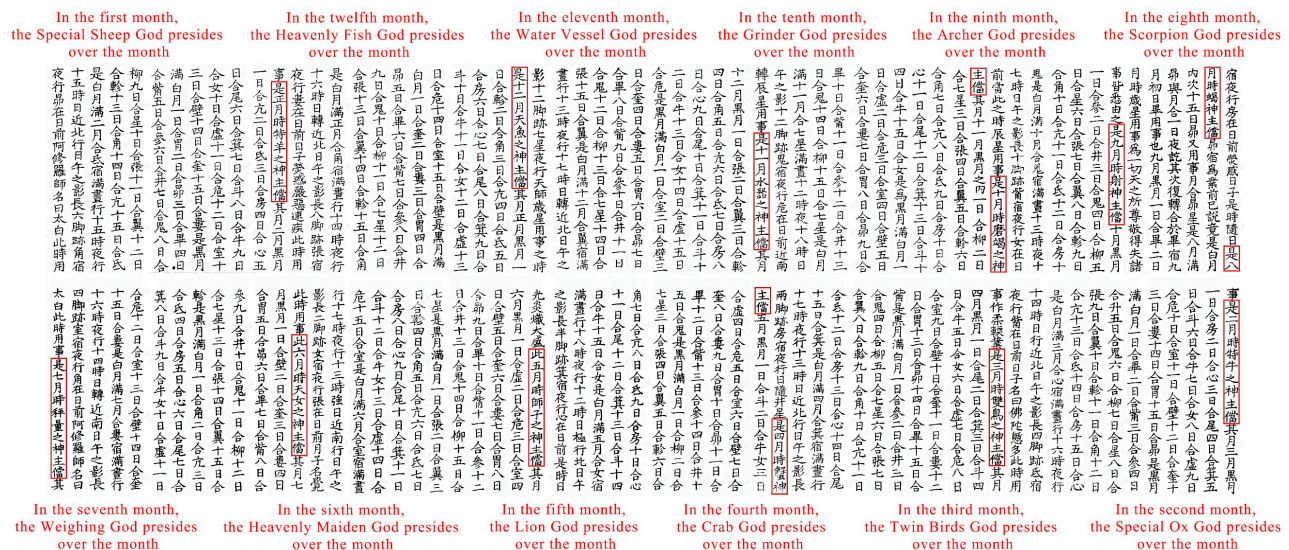


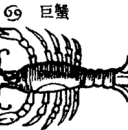
**Figure 3.** The Section on the Constellations in the Forty-Second Volume of the Mahayana Mahayana Sutra of the Sun Treasury, Part Two (Narendra-yas n.d., pp. 91–117).

Artisans painted this palace diagram on a circular dome with a diameter of 2.17 m. Twelve concentric circles form a large ring, and each palace occupies a circle within a circle. While preserving the West Asian system, it adopts a Greek geometric framework and incorporates a strong Tang Dynasty style. Beginning with Aries (Special Ram), the constellations follow the Babylonian nomenclature in a clockwise sequence, except for Taurus (Special Ox), which natural decay or human damage destroyed (Huebner 2016). Compared to the Greek foundational figures, these exhibit strong Tang-Song stylistic characteristics. The figures model Tang Chinese rather than Westerners. For example, Virgo depicts a Tang Chinese woman in Tang Chinese attire, portraying her as two women rather than one, while Aquarius shows a neck-banded pan-mouth bottle instead of a human figure holding a vessel and pouring water (Zheng 1996) (Table 2). These pronounced Tang Dynasty stylistic characteristics did not appear when the constellation charts first entered China (during the Sui and Tang dynasties). Only through development during the Tang Dynasty did the charts gradually adopt local stylistic elements, culminating in the Liao Dynasty.

**Table 2.** Comparative Chart of Zodiac Signs in Eastern and Western Traditions.

| No. | Signs of the Zodiac | Ancient Babylon                         | Ancient Greece                                                                      | Liao Dynasty                                                                        | Liao Mural Adaptations                                                              | Departures from Hellenistic Prototypes (Item) |
|-----|---------------------|-----------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| 1   | Aries               | 0–30°<br>(Ancient vernal equinox point) |  |  | It is a bowing ram rather than a reclining beast with a sheep's head, body and tail | 3                                             |

Table 2. Cont.

| No. | Signs of the Zodiac | Ancient Babylon                              | Ancient Greece                                                                      | Liao Dynasty                                                                        | Liao Mural Adaptations                                                                                                                                                 | Departures from Hellenistic Prototypes (Item) |
|-----|---------------------|----------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| 2   | Taurus              | 30–60°                                       |    | Destroyed                                                                           | /                                                                                                                                                                      | /                                             |
| 3   | Gemini              | 60–90°                                       |    |    | It is the image of a male and female duet rather than the posture of two god-like brothers with their waists clasped together                                          | 4                                             |
| 4   | Cancer              | 90–120°                                      |    |    | For a crab rather than a realistic lobster                                                                                                                             | 2                                             |
| 5   | Leo                 | 120–150°                                     |    |    | It is a yellow lion image rather than a realistic male lion                                                                                                            | 2                                             |
| 6   | Virgo               | 150–180°<br>(Autumnal equinox)               |   |   | They are Chinese dressed in Tang Dynasty costumes and are a pair of women rather than a single one                                                                     | 3                                             |
| 7   | Libra               | 180–210°                                     |  |  | It is a balance supported by a stand to maintain equilibrium rather than a balance without a stand                                                                     | 2                                             |
| 8   | Scorpio             | 210–240°                                     |  |  | They are all scorpions                                                                                                                                                 | 1                                             |
| 9   | Sagittarius         | 240–270°                                     |  |  | It is a portrait of a man leading a horse with a whip rather than a man with a horse's body bending a bow and shooting arrows                                          | 3                                             |
| 10  | Capricornus         | 270–300°                                     |  |  | It is a dragon-headed, fish-body and winged beast rather than a sheep-headed, sheep-body and fish-tail beast                                                           | 2                                             |
| 11  | Aquarius            | 300–330°                                     |  |  | It is a bottle with a sash around its neck, not a human figure holding a bottle and pouring water                                                                      | 2                                             |
| 12  | Pisces              | 330–360/0°<br>(Today's vernal equinox point) |  |  | Make the posture of the twin fish swimming in the Chinese style for the twin fish instead of joining the tails of mermaids and flying fish together with a thin string | 2                                             |

However, a fragment of a Tang Dynasty astrological manuscript that archaeologists unearthed in Turpan, Xinjiang 新疆, constitutes the only extant image proving the presence of Tang Dynasty traces in the zodiacal imagery. This fragment represents the earliest surviving depiction of the twelve zodiac signs in China and preserves the sole memory of Tang Dynasty palace diagrams. Judging from the surviving fragments, the lines are simple and concise. Only the upper right corner remains intact, preserving seven of the Twenty-eight Lunar Mansions and three zodiac signs: Libra (with both text and image), Scorpio (text only), and Virgo (image only) (Figure 4) (Y. Li 2025). However, according to relevant historical records, scholarly consensus holds that Liao palace diagrams inherited Tang-era iconographic programs (Figure 5) (Sun and Gai 2015). Given the near-total loss of Tang mural evidence, this study relies on the Turpan manuscript fragment as the sole extant pictorial reference for Tang Dynasty zodiacal imagery in China. While acknowledging the medium discrepancy, the fragment nonetheless reveals critical differences in figural treatment: Tang-era prototypes exhibit linear simplicity and volumetric suggestion, whereas the Zhang Shiqing tomb murals demonstrate a shift toward planar decoration and regional stylistic integration. This represents a distinct approach to cultural adaptation through two-dimensional stylization, differing from both Hellenistic volumetric conventions and the linear economy of the Tang fragment.

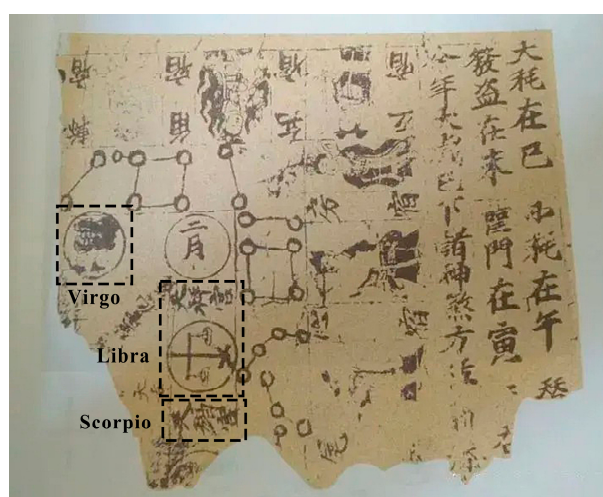


**Figure 4.** Fragments of a Tang Dynasty Astrological Chart Manuscript Unearthed in Turpan, Xinjiang, China.

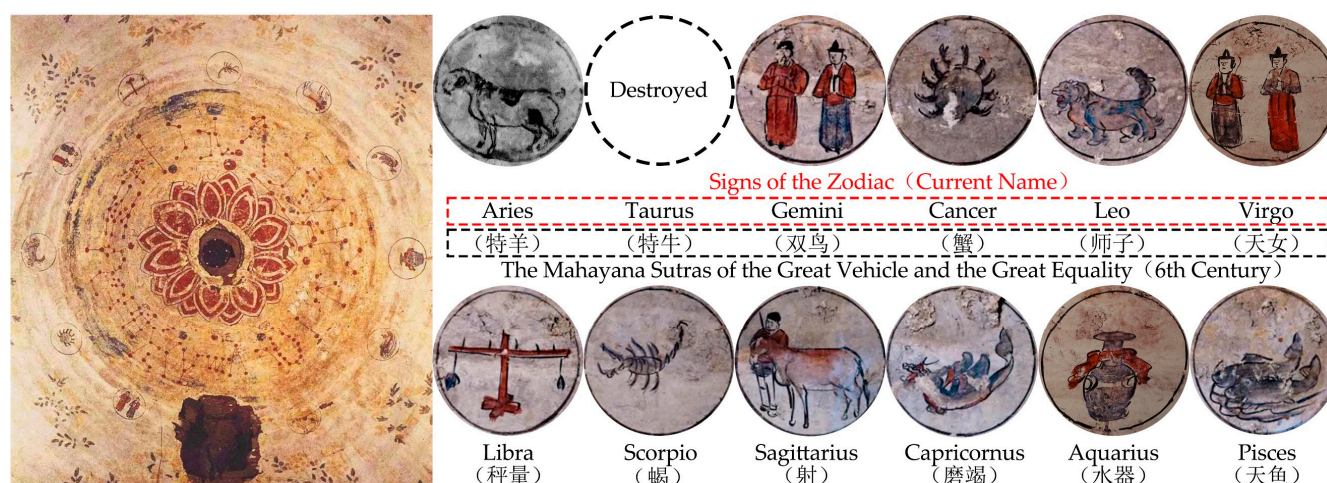


**Figure 5.** Zodiac Signs on the Ceiling of the Rear Chamber of Zhang Shiqing's Tomb.

Turning to the specific case of Zhang Shiqing's tomb, the zodiac imagery, building upon its Babylonian-Greek origins, underwent significant cultural adaptation and localization upon its introduction to China through Buddhism. Building upon the Tang Dynasty style, the artisans behind the palace diagrams in Zhang Shiqing's tomb actively localized and adapted them. This represents a distinct approach to cultural adaptation through two-dimensional stylization (flattening of volumetric forms), differing from both Greek illusionistic conventions and Tang dynasty painterly models. The following four palace diagrams primarily encompass this approach:

1. The Gemini Palace depicts a male figure on the left wearing a Khitan-style robe with a round collar and narrow sleeves. Historical records and surviving images indicate that robes primarily dominated the traditional attire of both men and women of the Khitan people, and these garments typically featured round collars and narrow sleeves. They wore long trousers, cinched the waist with a belt, and put boots on their feet—hallmarks of nomadic steppe cultures (Figure 6) (W. Sun 2019).
2. The Virgo Palace depicts two Khitan women wearing long robes with crossed collars, narrow sleeves, and left-lapel closures, their hair forming a single high bun. Married Khitan women primarily adopted this bun as their hairstyle (Figure 7) (Lin 2021).
3. The Sagittarius also depicts a male figure clad in Khitan attire, holding a long whip while leading a horse. Unlike the Gemini Palace, a short-sleeved tunic constitutes its upper garment, and tapered leggings known as “diao dun 吊敦” and leather boots complement the outfit. This attire, combined with the horse—a vital tool for travel, hunting, and warfare—ensures the robe drapes smoothly over the legs while riding. It provides maximum leg coverage for warmth while allowing unrestricted movement (Figure 8) (A. Wu 2020).
4. The Pisces Palace uniquely depicts environmental elements among all palace charts, specifically water ripples, which intrinsically link to the Khitan people's traditional Spring Nabuo 捺钵 ritual<sup>1</sup>. Given the Khitan custom of settling near water sources, their reverence for water deities and profound belief in shamanism gave rise to the “Water Deity Sacrifice” ceremony. This solemn ritual to honor the water deity preceded the core “fishing” activity of the spring Nabuo ceremony within the emperor's annual “Four Seasons Nabuo” system (Liang 2018). Over time, it evolved into a standard sacrificial practice for Khitan fishing and hunting. Thus, the Double Fish Palace configuration serves as a metaphorical invocation to the water deity for abundant catches during these activities (Figure 9).

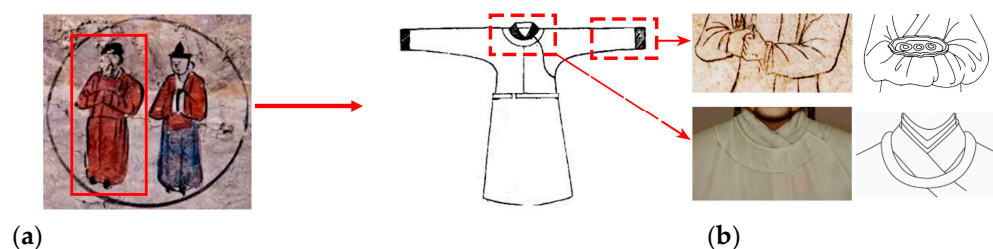


**Figure 6.** The Khitan Nomadic Culture in Gemini. (a) Gemini (Dong 2004, p. 101); (b) Narrow sleeves and round collars in Khitan clothing. Source: color photo taken by the author, Inner Mongolia Museum. All line art above was created by the author.

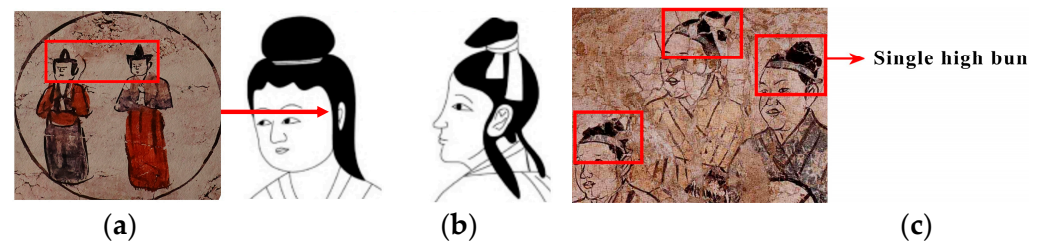


**Figure 7.** The Khitan Nomadic Culture in Virgo. (a) Virgo (Dong 2004, p. 101); (b) Front and side views of a single high bun hairstyle; (c) “Travel Map” of the Liao Dynasty Tomb in Lamagou 喇嘛沟, Aohan 敖汉 Banner, Inner Mongolia, China. Source: color photo taken by the author, Inner Mongolia Museum. All line art above was created by the author.

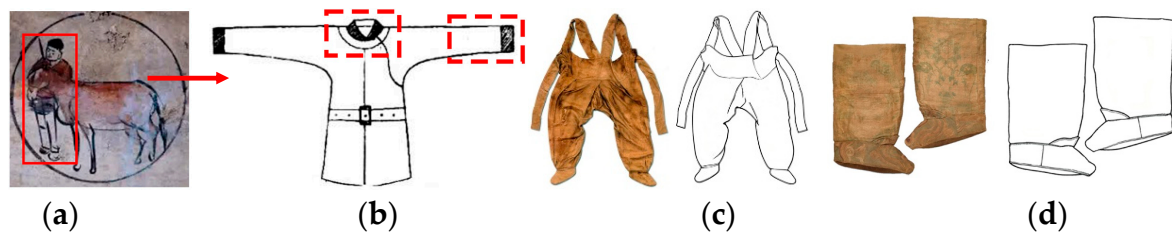


**Figure 8.** The Khitan Nomadic Culture in Sagittarius. (a) Sagittarius (Dong 2004, p. 101); (b) Narrow sleeves and round collars in Khitan clothing; (c) Tight-fitting skinny pants. Source: color photo taken by the author, Inner Mongolia Museum; (d) Leather boots. Source: color photo taken by the author, Inner Mongolia Museum. All line art above was created by the author.

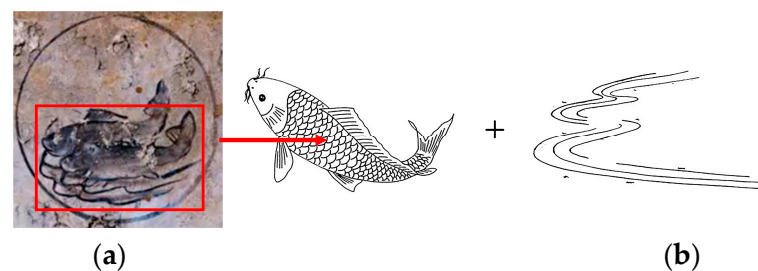


**Figure 9.** The Khitan Nomadic Culture in Pisces. (a) Pisces (Dong 2004, p. 101); (b) “Fish” represents the catch, while “water” symbolizes the water deity ritual. Together, they metaphorically embody the core activity of the spring Nabo ceremony within the four-season Nabo system: fishing and hunting. All line art above was created by the author.

Thus, while retaining the Greek framework, the zodiac diagrams achieved a profound transformation into a distinct Chinese style during the Liao Dynasty, simultaneously embodying the unique characteristics of that era.

## 2.2. Cultural Choices in the Curved-Necked Pipa of the “Scattered Music” Painting

The eastern wall of the front chamber in Zhang Shiqing’s tomb features a mural depicting a group of musicians. Among the various instruments, one held close to the chest originates from West Asia—the “curved-neck pipa.” (Esin Funda 2025). Having traversed the Eurasian continent from West Asia, this instrument integrated into the Liao Dynasty’s musical system with its distinctive form. The curved-neck pipa, as its name suggests, features a neck that curves backward—a defining characteristic distinguishing it from other pipas. Its body rounds at the bottom and tapers gradually upward, with four strings and four bridges (no frets) (Figure 10). The neck is shorter than the body, and musicians play it either held horizontally or diagonally across the body (Che 2012).

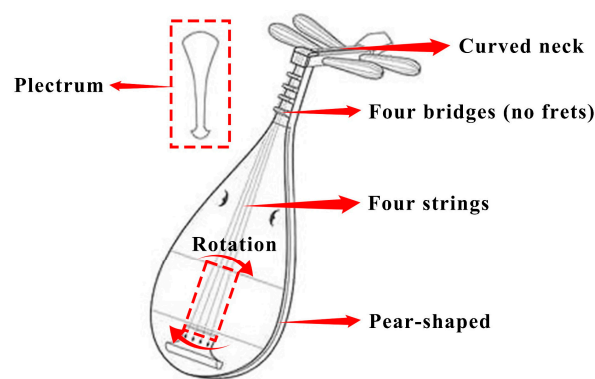


**Figure 10.** Structure of the Curved-Neck Pipa. Created by the author.

Its distant ancestry traces back to Sasanian Persia (modern-day Iran), where musicians knew it as the “Barbat” (بربط) or “Oud.” Through collecting and organizing materials on the eastward transmission of the curved-neck pipa, this paper summarizes the transmission routes and structural characteristics of the curved-neck pipa from Persia to China. The curved-neck pipa, as a material import directly from West Asia (Persia/Iran), shows obvious continuity.

It reveals that throughout this process, the instrument’s fundamental features remained largely consistent with no significant structural changes. Minor variations occurred only in the playing posture, the curvature direction of the neck, and performance techniques: musicians initially embraced it slantly, then predominantly held it horizontally after its introduction to China, and finally returned to the slanted embrace during the Liao Dynasty. The neck initially curved upward from the base. During the Wei 魏, Jin 晋 and the Southern and Northern Dynasties (220–589 AD), it curved downward from the top. In the Sui and Tang dynasties, it curved upward from the base before bending backward into a “Z” shape (Xu 2010; Zhang 2012; Zhou 2009). By the Liao Dynasty, it curved downward from the top. Musicians introduced the plectrum into playing technique. Although obscured in Zhang Shiqing’s tomb, the curved-neck pipa’s core features—curved neck, four strings, and diagonal holding—closely match Persian characteristics. It gradually integrated into the Liao Dynasty’s musical system and appears in other Liao tombs’ musical themes (Figure 11).

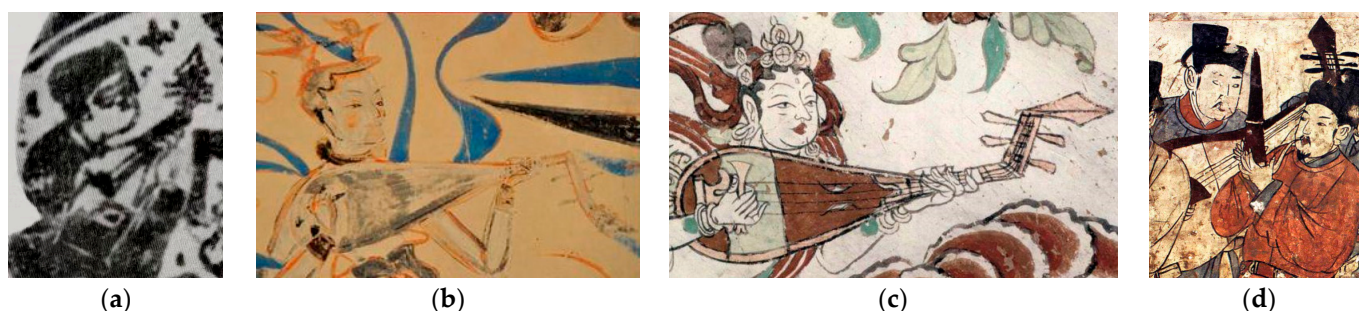


**Figure 11.** Characteristic Evolution of the Curved-Necked Pipa During Its Eastward Transmission. Source: (a) Pipa-playing musician depicted on a pottery shard unearthed in Persia (Sheng 2014); (b) South Wall of the Main Chamber, Cave 285, Mogao Caves 莫高窟, Western Wei 西魏 Period; (c) Mogao Cave 112 from the Middle Tang Dynasty; (d) The mural depicting musicians on the eastern wall of the antechamber in Zhang Shiqing’s tomb, Liao Dynasty.

These two forms of West Asian art did not undergo simple imitation or singular adaptation to Tang-Song visual conventions, but rather emerged as outcomes of cultural selection, visual construction, and cultural integration during their localization and adaptation in the Liao Dynasty. While differing in the degree of their localized adaptation, both exemplify the process of indigenous fusion and innovation that foreign cultures undergo upon entering China. After this paper clarifies the origins and selection of the primary West Asian artistic elements within the tombs, the following analysis will further examine the systematic adaptive characteristics these elements exhibit at the levels of tomb visual structure and social function.

### 3. Phenomenon: The Adaptive Logic of West Asian Art

#### 3.1. Visual Juxtaposition and Fusion

The celestial map of the zodiac signs on the dome ceiling of Zhang Shiqing's tomb does not stand in isolation. Multiple astrological systems arranged concentrically within the inner circle, forming a circular celestial map that fused the cultures of various regions into a single cosmic model. This physical spatial arrangement itself embodies a knowledge order. Visually, four distinct systems—the zodiac signs, the Twenty-Eight Lunar Mansions and the Big Dipper, the Nine Luminaries, and the nine-petaled lotus—meticulously organize themselves in concentric layers from outer to inner, centered upon a circular dome with a bronze mirror as its apex. This concentric structure itself serves as a powerful cosmic metaphor: the center (the bronze mirror) symbolizes the “North Pole” or “cosmic origin”, the inner circle (Nine Luminaries, Twenty-Eight Lunar Mansions, Big Dipper) represents the vast stellar sky, while the outer circle symbolizes the ecliptic belt (the apparent path of the Sun's motion). This arrangement aligns with Chinese imperial cosmological models, notably the *gaitian* 盖天 (Canopy Heaven) and *huntian* 浑天 (Encompassing Heaven) theories, which posit a domed or spherical celestial structure (Deck 2015). This structurally juxtaposed “Celestial Map” appears in two other locations among the mural paintings of Liao tombs, and artists depicted it on the domed ceilings of the Zhang Gongyou 张恭诤 Tomb and the Zhang Shigu 张世古 Tomb in Xuanhua (Figure 12). However, in these two Liao Dynasty tomb murals, the Twelve Palaces occupy the inner circle of the Twenty-Eight Lunar Mansions (Hebei Provincial Institute of Cultural Relics 2001).

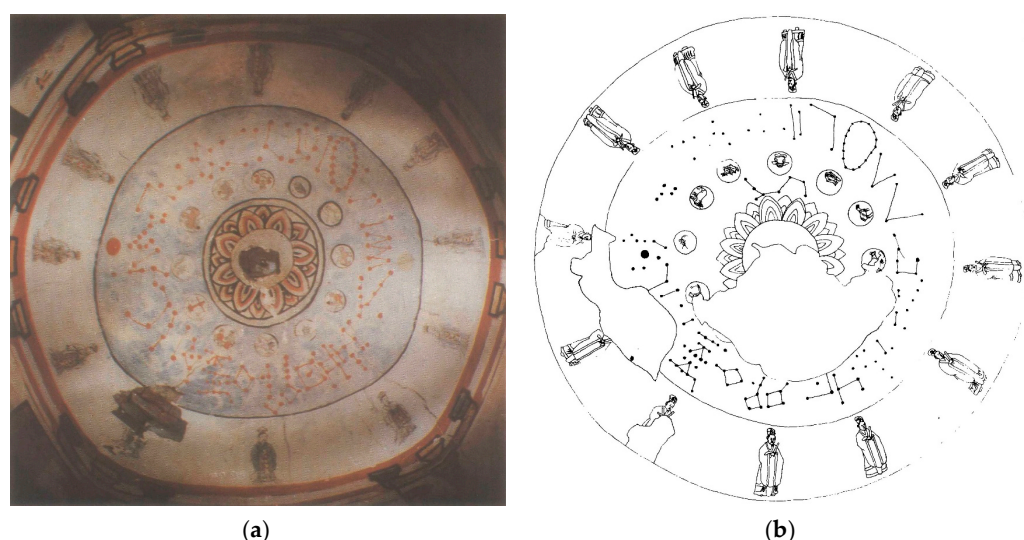


**Figure 12.** Celestial Maps in Other Liao Dynasty Tomb Murals. (a) Celestial Map on the Roof of Zhang Gongyou's Tomb (1113 AD) in Xuanhua; (b) Celestial Map on the Ceiling of the Rear Chamber of the Zhang Shigu's Tomb (1117 AD) in Xuanhua.

Simultaneously, this layout may resonate with the centripetal structure and function of mandalas in Buddhist art—both share the essence of constructing sacred space. At the core of a mandala lies an absolute origin (the principal deity/Buddha nature/Dharmakaya), from which the entire cosmic order emanates, organizes, and radiates outward. The square palace extends from the center to the inner circle, then to the outer circle, culminating in a protective ring—establishing a hierarchical structure of value and diminishing energy from core to periphery (Yang 2025). In contrast, the celestial map on the ceiling of Zhang Shiqing’s tomb centers on a bronze mirror, and successive tiers of celestial officials surround it. This arrangement reflects the imperial realm’s territorial divisions and civil and military officials guarding the center, each fulfilling their duties—replicating the earthly empire’s political and social hierarchy of “the sovereign at the center, with all directions paying homage.” (Qiu and Gan 2004) The outermost zodiac circle symbolizes the protective barrier in mandalas, and patterns like vajra chains or the Eight Great Cold Forests form this barrier. Both constructs establish a sacred cosmic space (Figure 13).

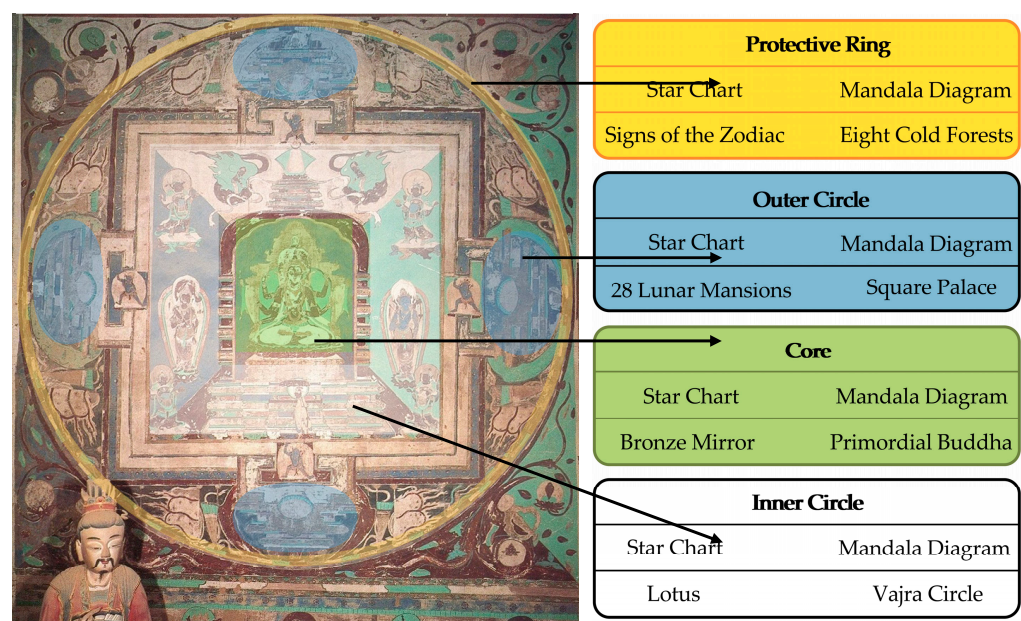


Figure 13. Correspondence Between Buddhist Mandala Diagrams and the Zodiac Signs.

Through the comparative study above, the evidence clearly shows that both structures share striking similarities in both form and spatial function. Both adopt a centripetal, circular, and hierarchical structure to construct cosmic space. This paper argues that such resemblance is not coincidental. The integration of the zodiac constellations with other celestial bodies likely drew inspiration from Buddhist mandalas, creating a cosmic model structurally and functionally akin to them. This adaptation ultimately gave rise to a “Chinese-style cosmic mandala” through localization. Thus, as a whole, it embodies both the traditional Chinese concept of “heaven being round” and serves as a Buddhist-influenced cosmic diagram. It represents a structured, symbolic visual abstraction of the “cosmos” within distinct cultural contexts, functioning as a miniature model of the universe.

However, regarding the core astrological systems of the star charts—the zodiac derived from Babylonian–Greek traditions and the indigenous Chinese Twenty-Eight Lunar Mansions—their juxtaposition aims to establish a correspondence between these two celestial sphere division systems. Sociologically speaking, the encounter between foreign knowledge and indigenous culture inevitably generates friction, leading to either fusion, conflict, assimilation, or innovation (Yixiong Wu 2025). Yet these two star-naming systems, rooted in distinct cultural traditions, exhibit perfect correspondence. They coexist

and mutually interpret each other, jointly describing the same cosmos. For instance, Aries corresponds to Leu 娄, Wei 胃, and Mao 昴 among the Twenty-Eight Lunar Mansions; Taurus aligns with Pi 毕, Tzu 觜, and Shen 参; Gemini corresponds to Ching 井 and Kuei 鬼 (Figure 14, Tables 3 and A1). This very arrangement serves as a visual declaration of knowledge integration, implying their equal importance and complementary nature.

The curved-neck pipa of West Asian art also does not constitute an isolated, accidental cultural fragment, but rather embodies a tangible outcome of the Khitan people's deliberate selection, technical assimilation, and systematic integration of cultural elements from different times and places during a specific historical period. Regarding the curved-neck pipa itself, its form exhibits remarkable stability. As previously noted, the core characteristics depicted in musical illustrations—a curved neck, four strings, and a pear-shaped soundbox—trace their origins to Persia. This design aligns closely with Tang Dynasty artifacts and persisted into the Liao Dynasty (R. Wu 2014). Although contrasting with the Song Dynasty of the same period (where the neck became longer and the soundbox proportions changed) (X. Wang 2004), musicians clearly used a plectrum to play (Tsao 2000). Nevertheless, the main structure of the pipa remained consistent with the Persian model, inheriting the playing techniques of the Tang Dynasty pipa, reflecting a cultural mindset that “revered the Tang as the standard”.

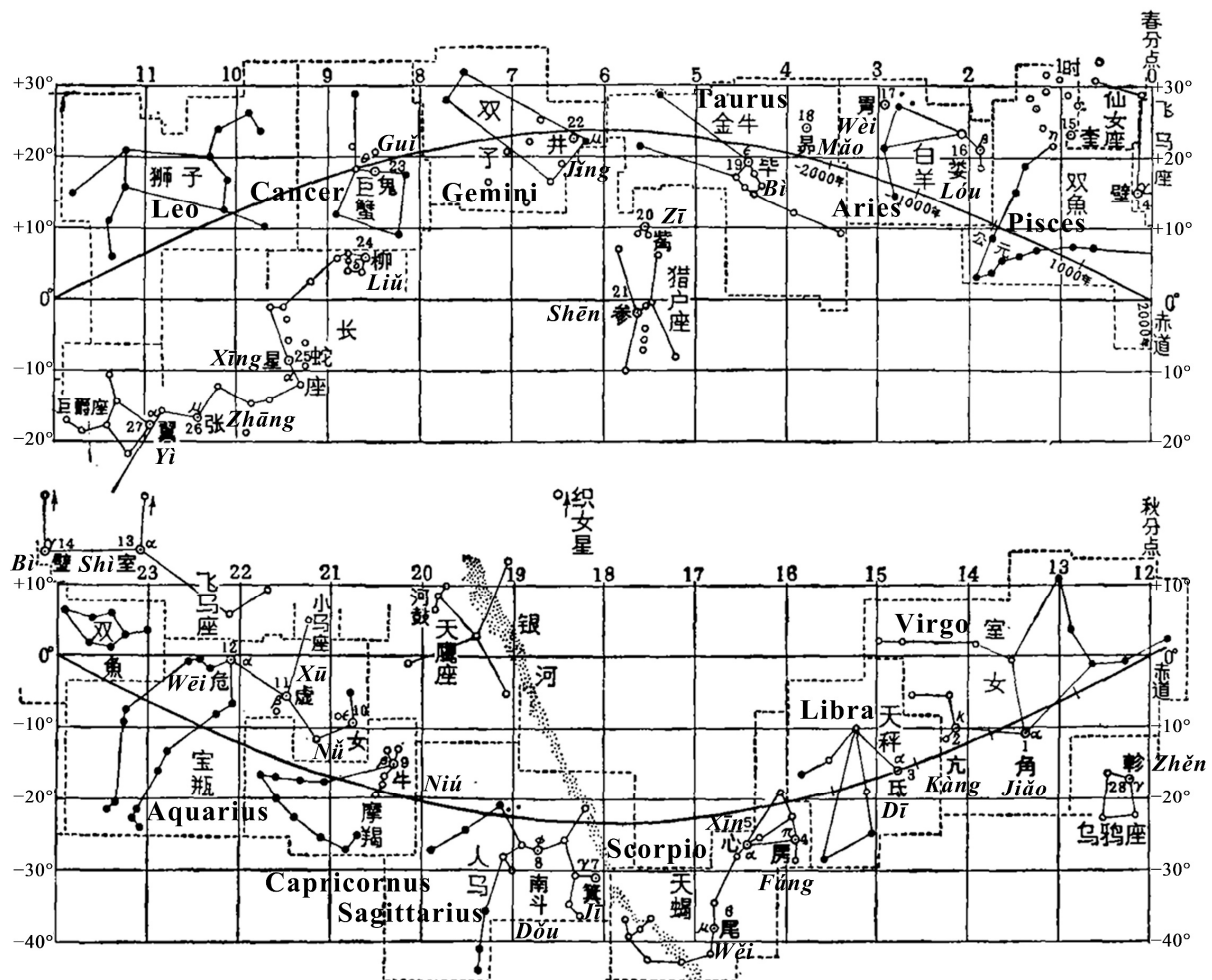
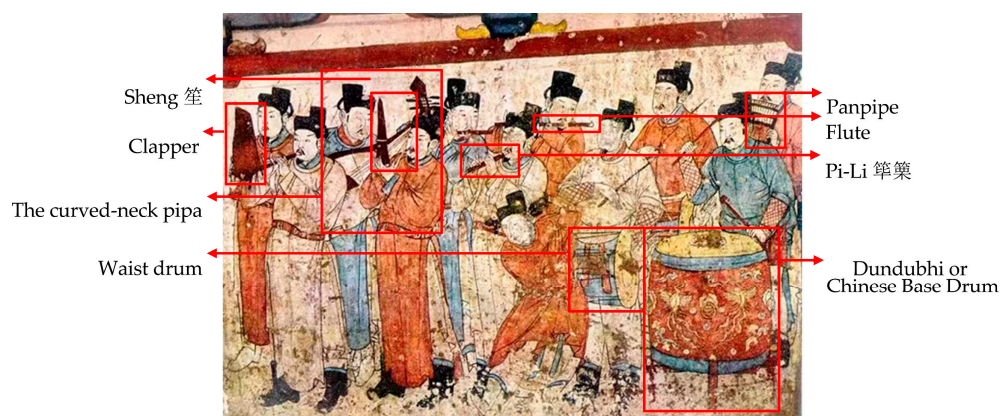


Figure 14. The Relationship Between the Twenty-Eight Lunar Mansions, the Twelve Palaces, the Celestial Equator, and the Ecliptic<sup>2</sup> (Xia 1976, p. 36).

**Table 3.** Correspondence Between the Zodiac Signs and the 28 Lunar Mansions.

| No. | Signs of the Zodiac | The 28 Lunar Mansions    |
|-----|---------------------|--------------------------|
| 1   | Aries               | Lóu, Wèi, Mǎo (娄、胃、昴)    |
| 2   | Taurus              | Bì, Zī, Shēn (毕、觜、参)     |
| 3   | Gemini              | Jǐng, Guǐ (井、鬼)          |
| 4   | Cancer              | Liǔ, Xīng, Zhāng (柳、星、张) |
| 5   | Leo                 | Yì, Zhēn (翼、轸)           |
| 6   | Virgo               | Jiǎo, Kàng (角、亢)         |
| 7   | Libra               | Dī, Fáng (氏、房)           |
| 8   | Scorpio             | Xīn, Wěi (心、尾)           |
| 9   | Sagittarius         | Jī, Dǒu (箕、斗)            |
| 10  | Capricornus         | Niú, Nǚ (牛、女)            |
| 11  | Aquarius            | Xū, Wēi (虚、危)            |
| 12  | Pisces              | Shì, Bì (室、壁)            |

The curved-neck pipa entered musical performance scenes, becoming part of a carefully designed, fixed “musical ensemble” configuration. This represents an innovative intellectual contribution to tomb art during the Liao Dynasty. It juxtaposes the curved-neck pipa with traditional Chinese instruments like the transverse flute, clappers, Chinese base drum, sheng 笙, and pan flute, alongside the Kucha-style Pi-Li 箏箏 from the Western Regions and the waist drum from India/China (its origin remains debated), all within a single musical performance scene (Yan 2019). This arrangement fuses cultural elements from multiple regions. All musicians’ postures, expressions, and movements exhibit a high degree of uniformity and stylization. Musicians arrange the instruments in strict order, with the dancers forming the central axis. The two sides of the musical ensemble are largely symmetrical, yet variations appear in the details: dancers lead the front row. The curved-neck pipa, due to its large size and the need to be held close, occupies the rear row (third row). The large drum sits on the ground in the second row. Artists arrange other smaller instruments appropriately, creating a staggered and harmonious effect. (Figure 15).

**Figure 15.** Mural Depicting Music and Dance on the East Wall of the Front Chamber of Zhang Shiqing’s Tomb.

Comparative analysis reveals that musical instrument ensembles depicted in multiple Liao Dynasty tomb paintings across other regions—typically including the curved-neck pipa—exhibit similar high stability (Figure 16). This fixed arrangement of the “scattered

music ensemble” represents a unique innovation in the tomb of a former Song subject under Liao rule. The pipa no longer remained an isolated West Asian instrument and instead became a standard voice within this ritualized, codified orchestra. Through knowledge integration, it evolved into an indispensable and vital component.

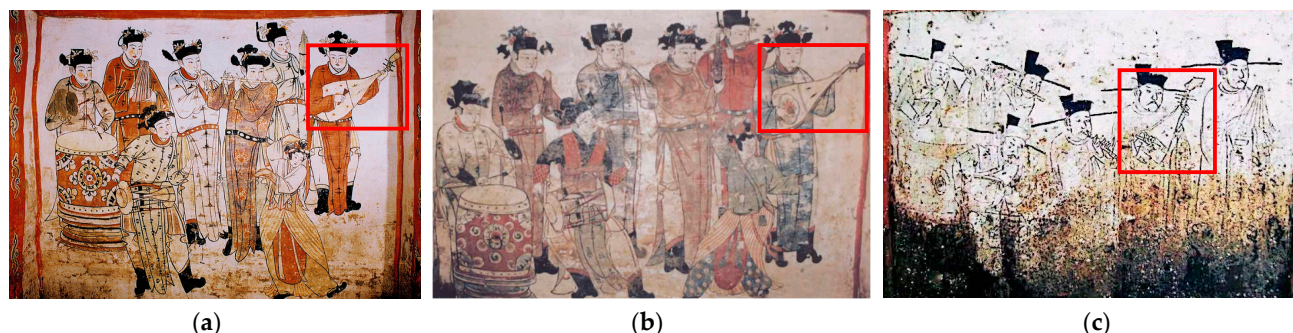


**Figure 16.** Musical and Dance Scenes in Other Liao Dynasty Tomb Murals. (a) The “Scattered Musician Painting” on the West Wall of the Anterostructure in Tomb M10 of Zhang Kuangzheng 张匡正; (b) the “Scattered Musician Painting” on the West Wall of the Antechamber in Tomb M6, Xuanhua Liao Tombs; (c) the “Scattered Musician Painting” on the Right Wall of Zhao Li 赵励’s Tomb in Shijingshan 石景山 District, Beijing 北京.

### 3.2. Functional Integration and Recontextualization in Space

The zodiac signs and other elements within the celestial map assume composite, mutually reinforcing functions within this new funerary context. The bronze mirror and lotus at the visual center, as symbols of the ultimate destination, dominate the entire celestial map with their potent Buddhist symbolism (Pure Land, birth, transcendence). They subsumed the peripheral “astronomical knowledge”—the twelve zodiac signs and twenty-eight lunar mansions—under Buddhism’s “ultimate concern.” This signifies that regardless of cosmic movements, the ultimate truth and destination lie in Buddhism’s Pure Land of Nirvana.

The Twenty-Eight Lunar Mansions in traditional Chinese culture associated with the dynastic “celestial divisions” theory (Qiu 2014), carrying strong connotations of political legitimacy. In Zhang Shiqing’s tomb, the tomb’s occupant perpetuated this function to proclaim the Liao Dynasty’s claim to the legitimate Chinese throne and to construct a cosmic environment familiar to him and aligned with the “Way of Heaven”. This ensured his soul could rest within a proper order. The twelve zodiac signs primarily served astrology and astronomical observation in the West (Yuhong Wu 2009). However, within Zhang Shiqing’s tomb, their function underwent a significant Buddhist transformation. This shift in role closely linked the twelve constellations to Buddhist concepts of time, space, and reincarnation. They became not merely markers of celestial regions but symbols determining the destinies of all beings—a transitional zone bridging the mundane and the sacred. Together with the twenty-eight lunar mansions, they formed a “safe zone” for the soul’s ascent to heaven, serving protective and benevolent functions. This star chart integrates disparate knowledge systems into a unified framework, representing a profound functional synthesis and value reconstruction.

Musicians primarily used the curved-neck pipa instrument in imperial court banquets, secular entertainment, and Buddhist celestial dance scenes, and it served as a vibrant component of musical life. However, in the murals of Zhang Shiqing’s tomb, it transformed from a tool of earthly entertainment into a fixed symbol within the funerary ritual space, dedicated to providing the tomb owner with “eternal music” in the afterlife.

First, a physical spatial transition occurs from the banquet halls of the living to the burial realms of the dead. The curved-neck pipa originally existed within a dynamic,

sonic physical space—the banquet settings of imperial palaces and aristocratic residences—where its core function was auditory appreciation, serving the entertainment and artistic enjoyment of the living present. Within Zhang Shiqing’s tomb, however, it undergoes re-contextualization. The artists transplant the pipa into a static, silent, eternal space created for the deceased—the tomb. This fundamental spatial shift transforms its core function from auditory artistry to visual symbolism. Its significance no longer hinges on tone or technique, but on the presence of the image itself.

Secondly, the curved-neck pipa underwent a localized adaptation from an entertainment instrument to a ceremonial implement. As a significant instrument steeped in Persian cultural heritage, its music conceptually served as a ritualistic sound capable of communicating with deities, entertaining spirits, and soothing souls—akin to ceremonial music in sacrifices. Thus, Liao society or the tomb’s occupant endowed it with entirely new, elevated social and religious functions. Within the specialized ceremonial space of the tomb, every artifact served the tomb’s occupant. The curved-neck pipa became a symbol of power and status, showcasing Zhang Shiqing’s wealth, taste, and social standing in the afterlife. It signified his continued entitlement to high-level honors in the underworld, matching those enjoyed in life—or even surpassing them. By merging the Tang Dynasty concept of “music” with its own “ritual,” it created a new mural image paradigm—a trinity of musicality, visuality, and ceremoniality.

Finally, the zodiac signs and the curved-neck pipa depicted in the murals of Zhang Shiqing’s tomb each exhibit knowledge-integration adaptation within their respective contexts. When both are placed within the entirety of the tomb space, a functional coordination emerges between them. This coordination is not a direct physical link but a ritual complementarity rooted in Buddhist cosmology. The curved-neck pipa, integrated with other musical instruments in the front chamber, participates in constructing a sacred sonic field—what Buddhist ritual texts term “celestial sound” 天乐 or “Dharma sound” 法音. The related esoteric texts explicitly associate instrumental performance with Pure Land visualization: sound marks sacred space and accompanies the deceased’s consciousness through intermediate realms (Li and Fei 2010). The ensemble’s directional orientation—musicians facing the rear chamber where the celestial map is located—creates a spatial axis from sound to stars, but this is not guidance in a navigational sense. Rather, it constitutes atmospheric consecration: the sonic field renders the tomb a liminal environment between death and rebirth, within which the zodiac provides astral coordinates and the ensemble provides sacred ambience. Together they form a coordinated ritual technology for afterlife transition (Figure 17).

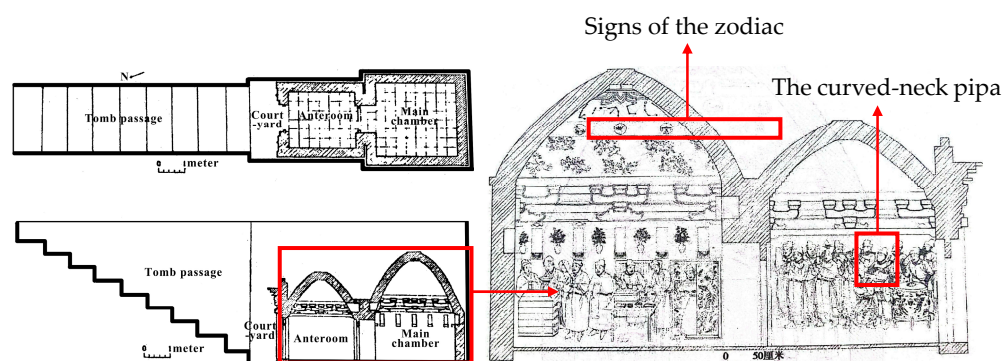


**Figure 17.** Plan and Section of Zhang Shiqing’s Tomb. In *Xuanhua Liao Tombs: Burial Art and Liao Dynasty Society*, by Q. Li (2008, p. 85).

This demonstrates that West Asian culture exhibits remarkable cultural adaptability, not only achieving localization within its own context but also integrating with other cul-

tures in the same environment to produce richer cultural outcomes. Research indicates that cultural integration during the Liao Dynasty did not simply replace or exclude other elements, but rather created a synthesis that preserved distinct characteristics. From the perspective of cultural adaptation theory, the zodiac signs in tombs embody “knowledge-integration adaptation,” representing a complex model of cultural adaptation. According to Berry’s two-dimensional model of cultural adaptation, this process involves two core dimensions: preserving original cultural identity and engaging with other cultural groups (S. Sun 2018). When encountering Western zodiac knowledge, the Liao Dynasty maintained its commitment to the traditional Chinese system of the Twenty-Eight Lunar Mansions while actively integrating the zodiac signs. This integration did not merely result from cultural contact; rather, the Liao Dynasty deliberately implemented it as part of its national political strategy, rendering the process more systematic and constructive. From the perspective of cultural fusion theory, the zodiac signs and curved-neck pipa collectively exhibit characteristics of “cultural convergence” and “cultural cross-fusion,” while individual elements also represent minor cultural integrations.

However, the adaptation patterns observed in Zhang Shiqing’s tomb involve three distinct mechanisms that must be analytically separated:

- (1) Active selection. The Khitanization of zodiac figures and the Pisces–water deity association represent deliberate cultural engineering: artisans modified imported prototypes to assert steppe identity and local ritual knowledge. The pipa’s fixed position in the ensemble similarly reflects programmatic choice, not random inclusion.
- (2) Accommodative absorption. Buddhist scripture and workshop tradition provided non-negotiable frameworks within which foreign elements were received. The zodiac sequence follows the *Mahāvaiṣṇava Mahāsamghāta Sūtra* not because artisans selected this ordering from alternatives but because Buddhist cosmology constituted the only available epistemic container for astral knowledge. The Tang–Song figural style was transmitted through workshop pattern-books as professional default. Yet these constraints were not merely limiting: they enabled integration by providing recognizable visual grammars.
- (3) Innovative reconstruction. The tomb program does not simply juxtapose foreign and local elements but reconfigures their relationships to produce unprecedented syntheses. The zodiac ceiling is not a Babylonian–Greek chart with Khitan figures substituted; it is a Buddhist cosmic mandala that reassigns astral divination to soteriological function. The pipa ensemble is not a Persian instrument added to a Chinese orchestra; it is a Liao ceremonial soundscape in which the foreign instrument’s sacred connotation (Buddhist liturgical association) is activated while its secular entertainment function is suppressed.

#### 4. Materials and Methods

The study adopts an interdisciplinary, image-led workflow that integrates high-resolution field documentation, 3D photogrammetry, and open-source GIS to guarantee replicability.

##### 1. Data acquisition

- Tomb interior: We generated a 0.5 mm ground-sample-distance (GSD) orthomosaic of every mural from 1200 Nikon D850 RAW images (24 mm lens, f/8, ISO 200), capturing the images on a carbon-fiber gantry to avoid contact.
- Celestial map: We recorded the 2.17 m dome with a 5-stop bracket at 30° intervals; we stitched HDR cubes in Agisoft Metashape v.1.8 and georeferenced them to the 1116 AD celestial equator (J2000.0 precession corrected) using IAU constellation boundaries.

- Comparative corpus: We sampled curved-neck pipa depictions from 42 securely dated Liao tombs (907–1125 AD) stored in the Hebei 河北 Provincial Archives; we vectorized each instrument outline in Inkscape 1.2 and deposited it as the SVG dataset “LIAO-PIPA-2025” (CC-BY 4.0) (Table 4).

Table 4. Imaging protocols for mural documentation.

| No. | Region                                    | Equipment Model | Lens Focal Length | GSD (mm px <sup>−1</sup> ) | Exposure Mode      | Image Count | Output Format | Purpose                                 |
|-----|-------------------------------------------|-----------------|-------------------|----------------------------|--------------------|-------------|---------------|-----------------------------------------|
| 1   | Celestial Map on the Domed Ceiling        | Nikon D850      | 24 mm             | 0.22                       | HDR 5-br           | 144         | 16-bit TIFF   | Vectorization of Constellation Outlines |
| 2   | Scattered Musician Scene on the East Wall | Canon R5        | 50 mm             | 0.38                       | Single sheet 1/60s | 96          | 14-bit RAW    | Instrument Morphometry                  |
| 3   | Complete Tomb Reconstruction              | DJI P4 RTK      | 24 mm             | 0.80                       | Timer 2s           | 312         | 20 MP JPG     | General Plan and Section Modeling       |

2. Analytical protocol
- Visual feature coding: Two independent coders ( $k = 0.87$ ) annotated 38 morphological traits for every zodiac figure (head–body ratio, garment fold angle, attribute presence) and 14 lutherie metrics for each pipa (neck curvature, string count, playing posture). A third coder resolved discrepancies.
  - Cultural adaptation scoring: We applied a four-level ordinal scale (0 = exact import, 1 = cosmetic tweak, 2 = functional hybrid, 3 = de novo creation) was applied; inter-rater reliability (weighted  $k = 0.82$ ) exceeded the 0.75 threshold.

5. Mechanism: The Driving Force Behind Adaptive Trait Formation

The zodiac constellations and curved-neck pipa depicted in the murals of Zhang Shiqing’s tomb primarily exhibit an adaptation that knowledge integration characterizes. The Liao Dynasty’s dual political system of “governing according to local customs,” the spread of Buddhism, and shifting social functions that achieved visual integration shaped this feature.

5.1. Political Drivers: The Inherent Demand for Knowledge Integration in the “Dual-Unity” Political–Cultural Structure

The Liao Dynasty adopted a dual administrative system as its core governance strategy, which “governed according to local customs” (Chen 2024). This ingeniously established two parallel yet complementary administrative frameworks tailored to the distinct production methods (nomadic pastoralism and agriculture) and cultural heritages of the various ethnic groups within its realm, including the Khitan, Han, and Bohai peoples (Sloane 2019). This political duality manifested in cultural policy as a high degree of pragmatism and inclusivity. The Liao Dynasty required both the institutional frameworks of the Tang Dynasty to consolidate its rule and the resources of West Asia and Buddhism to enrich its spiritual world and international trade. This state-level integration strategy provided fertile ground for the introduction and adaptation of the zodiac signs. Thus, the Liao Dynasty itself functioned as a vast “cultural integration machine”. Its political structure inherently demanded mastery and navigation of multiple cultural traditions. The celestial charts in Zhang Shiqing’s tomb murals, featuring multiple constellations juxtaposed, represent the microcosmic projection of this state-level cultural strategy within a burial space.

Simultaneously, the ensemble depicted in the Scattered Music Painting—comprising instruments like the curved-neck pipa—constitutes a display of cosmopolitan ritual competence. The presence of instruments associated with multiple cultural spheres does not

reflect administrative structure but constructs prestige through geographic breadth: the tomb occupant commands sonic resources from across the known world, asserting after-life status through cultural range. This is ritual competition, not political homology. The mural's orchestra thus became an idealized, ritualized model of Liao order. Conversely, the political aspiration for "unity" inevitably projected itself culturally through the integration of the curved-neck pipa with other instruments.

### 5.2. Religious Drives: The "Packaging" and "Localization Integration" of Buddhism

The zodiac constellations did not enter China as an independent astronomical theory but rather as part of the esoteric Buddhist scriptural system, entering the Liao Dynasty cultural sphere in the form of a "knowledge package". From the Northern and Southern Dynasties through the Tang Dynasty, translators rendered numerous Buddhist texts containing astronomical and astrological content into Chinese. Amoghavajra 不空 (705–774 AD) translated *the Sutra of the Constellations* 宿曜经 during the Tang Dynasty, and these texts integrated the Babylonian-Greek zodiac constellations and the Indian twenty-seven/twenty-eight Mansions ("Nāsaṭra") with China's traditional Twenty-Eight Mansions. Buddhist scholars systematically integrated these systems into Buddhist cosmology and spiritual practices. The sutra explicitly aligned the twelve zodiac signs with concepts like the twelve lunar months, the twelve links of dependent origination, the Twenty-Eight Mansions, and the Nine Luminaries (H. Li 2007). Practitioners employed this framework for divining fortune, selecting auspicious dates, and imbued it with Buddhist interpretations. This endowed the zodiac with a sacred religious aura and practical functionality, integrating it as part of the Buddha's teachings transmitted through the "Thus Have I Heard 如是我闻" tradition.

Concurrently, Buddhism flourished immensely during the Liao Dynasty (D. Wang 2023). For devout Buddhists like Zhang Shiqing (whose tomb inscription explicitly records his recitation of sutras, worship of Buddha, and construction of Buddhist temples), inheriting this scholarly tradition and systematically visualizing these textual correspondences through tomb murals constituted a religious practice aimed at accumulating merit and ensuring rebirth in a favorable realm. Buddhism's authority granted ideological legitimacy and necessity to this imported knowledge, making it an essential religious element for constructing an ideal afterlife.

The curved-neck pipa stands as one of the core instruments in Buddhist music. Buddhist chants documented in scriptures, such as the *"Puyan Chant 普庵咒"*, feature passages like "Buddha's Head", "Commencement of Chant", and "Lotus Throne Manifesting Auspicious Signs", and musicians perform all of these primarily on the pipa (Zhang and Fu 2020). The instrument's clear, elegant timbre creates a profoundly sacred atmosphere, allowing devotees to experience the solemnity of Buddhist teachings through music. It serves to purify the mind and calm the spirit, making it an essential tool for Buddhist practice. As a devout Buddhist, Zhang Shiqing naturally depicted the curved-neck pipa in his "Scattered Music" painting. Originally a traditional Persian instrument, the curved-neck pipa later became a Buddhist ritual implement. Its integration into the tomb served dual purposes: to highlight the tomb owner's social status and Buddhist faith, while also leveraging the pipa's Buddhist function to transform it into a conceptual ritual implement. This served the entire burial ritual space by calming and stabilizing the spirit.

### 5.3. Social Function-Driven: Guiding the Soul Within Spaces and Constructing Ceremonial Sound Fields

In premodern funeral beliefs, unknowns and dangers filled the afterlife, requiring clear orientation for the soul's journey. The integration of the Twelve Palaces and Twenty-Eight Mansions on the ceiling of Zhang Shiqing's tomb served a cognitive-mapping function: it provided a coordinate system for locating the soul within Buddhist cosmology,

not a mechanical navigation system. The zodiac marks temporal-cyclical position (ecliptic); the Twenty-Eight Mansions mark spatial-equatorial position. Together they constitute a dual-axis reference frame—what we term a “cosmic coordinate system”. Neither the Twelve Palaces nor the Twenty-Eight Mansions alone constituted a complete coordinate system. Their integration provided the soul with a precise dual-coordinate system for spatio-temporal positioning.

The Twenty-Eight Lunar Mansions (associated with the Chinese equatorial coordinate system) function as the vertical axis, establishing the soul’s fundamental orientation within the traditional Chinese celestial sphere. Meanwhile, the Twelve Zodiac Signs (associated with the ecliptic coordinate system) serve as the horizontal axis, marking the Sun’s annual apparent motion trajectory and symbolizing the cyclical nature of time and rebirth. This “dual-coordinate” celestial map guides the soul, enabling it to pinpoint its precise spatiotemporal location within the vast cosmos, facilitating smooth reincarnation and preventing spiritual disorientation. Zhang Shiqing thus painted it on the ceiling of the main burial chamber to establish a correct path guiding the soul’s ascent to heaven.

Moreover, the centripetal structure of the entire celestial map suggests a clear ascension path: the soul departs from the burial space (the real world), first entering the “Ordered Starry Sky” that the Twelve Palaces guard. It then traverses inward along this corridor paved with sacred knowledge, passing through the inner circles (where the Twenty-Eight Lunar Mansions and Nine Luminaries reside), ultimately reaching the lotus at the cosmic center—the symbol of the Buddhist Pure Land. Here, the twelve zodiac constellations do not merely constitute regions but serve as “relay stations” that the soul must pass through sequentially, a process imbued with ritualistic and procedural significance.

In contrast, the curved-neck pipa participated in Buddhist ceremonial soundscapes, contributing to “musical offerings” 音乐供养 that consecrated ritual space. Its documented role in both Buddhist liturgy (Zhang and Fu 2020) and secular entertainment endowed the pipa imagery with dual ritual potential: within the tomb, this potential is activated toward sacred function—not because the pipa “guides” the soul, but because its presence signifies the availability of celestial sound. The tomb owner does not “use” the pipa to navigate; rather, the pipa’s depiction marks the tomb as a sonically consecrated environment within which afterlife transition occurs.

## 6. Conclusions

This study integrates perspectives from multiple disciplines including art history, ethnology, geography, archaeology, and history. Through analyzing the Western Asian artistic elements (the zodiac signs and the curved-neck pipa) in the murals of Zhang Shiqing’s tomb, it reveals a multi-mechanism adaptation process that selectively absorbs, functionally reconstructs, and visually recreates foreign elements while preserving regional cultural sovereignty. This achieves an organic fusion of cultural elements. Throughout this localization process, West Asian art exhibits distinct characteristics of “knowledge-integrated adaptation.” The zodiac signs, while retaining their Greek graphic framework, incorporate Khitan nomadic stylistic elements, forming visual symbols with both Chinese and Western features that integrate into the Liao Dynasty’s celestial constellation system. The curved-neck pipa, with its highly stable form, organically embeds itself into the ensemble configurations of Liao Dynasty folk music. This characteristic emerged as a product of conscious cultural selection and visual reconstruction, and the unique political, religious, and social functional contexts of the Liao Dynasty drove it.

The Liao Dynasty's proactive and strategic integration of West Asian art reveals how cosmopolitan display functioned as ritual capital in elite burial practice. Rather than manifesting political structure, this integration constructs afterlife sovereignty through the deliberate assembly of prestigious foreign and regional elements. It demonstrates that cultural fusion can create new, richer cultural forms while preserving distinct cultural identities. This constitutes not only research on Liao Dynasty art but also a valuable exploration of premodern Chinese cross-cultural history, offering a significant perspective for understanding the complexity and creativity of premodern Sino–Western cultural exchange.

## 7. Patents

During the research process, a computer software copyright was obtained from the National Copyright Administration of the People's Republic of China. The software, titled "3D Reconstruction and Data Archiving Platform for West Asian Elements of Liao Dynasty Tombs V1.0," has been officially registered under the number 2025SR1473712.

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**Conflicts of Interest:** The authors declare no conflicts of interest.

## Abbreviations

The following abbreviations are used in this manuscript:

|       |                                           |
|-------|-------------------------------------------|
| BCE   | Before the Common Era                     |
| AD    | Anno Domini                               |
| 3D    | Tri Dimensional                           |
| GIS   | Geographic Information System             |
| GSD   | Ground Sampling Distance                  |
| RAW   | RAW Image Format                          |
| HDR   | High Dynamic Range                        |
| IAU   | International Association of Universities |
| SVG   | Scalable Vector Graphics                  |
| CC-BY | Creative Commons Attribution              |
| ANOVA | Analysis of Variance                      |
| CE    | Declination between $\pm 35^\circ$        |
| Fa    | Fall                                      |
| Wi    | Winter                                    |
| Sp    | Spring                                    |
| Su    | Summer                                    |

Appendix A

**Table A1.** The Star sequence naming, earthly branches, areas, locations, seasons, number of stars of magnitudes 1–4, and number of stars visible to the naked eye for the zodiac signs.

| No. | Signs of the Zodiac | Star Sequence Naming    | Earthly Branches | Area (Square Degrees, °²) | Location | Season | The Number of Stars of Magnitude 1–4 | Stars Visible |
|-----|---------------------|-------------------------|------------------|---------------------------|----------|--------|--------------------------------------|---------------|
| 1   | Aries               | jiàng lóu<br>(降娄宫)      | Dog 戌            | 441°²                     | CE       | Fa     | 0-1-1-2                              | 50            |
| 2   | Taurus              | Aldebaran<br>(大梁宫)      | Rooster 酉        | 797°²                     | CE       | Wi     | 1-1-2-23                             | 125           |
| 3   | Gemini              | shí shěn<br>(实沈宫)       | Monkey 申         | 514°²                     | CE       | Wi     | 1-2-4-12                             | 70            |
| 4   | Cancer              | Alhena<br>(鹑首宫)         | Goat 未           | 506°²                     | CE       | Wi     | 0-0-0-6                              | 60            |
| 5   | Leo                 | chún huǒ<br>(鹑火宫)       | Horse 午          | 947°²                     | CE       | Sp     | 1-2-3-12                             | 70            |
| 6   | Virgo               | chún wěi<br>(鹑尾宫)       | Snake 巳          | 1294°²                    | CE       | Sp     | 1-0-3-11                             | 95            |
| 7   | Libra               | shòu xīng<br>(寿星宫)      | Dragon 辰         | 538°²                     | CE       | Su     | 0-0-3-4                              | 60            |
| 8   | Scorpio             | Antares<br>(大火宫)        | Rabbit 卯         | 497°²                     | CE       | Su     | 1-3-10-10                            | 100           |
| 9   | Sagittarius         | Kaus Australis<br>(析木宫) | Tiger 寅          | 867°²                     | CE       | Su     | 0-2-8-10                             | 115           |
| 10  | Capricornus         | Altair<br>(星纪宫)         | Ox 丑             | 414°²                     | CE       | Fa     | 0-0-2-7                              | 50            |
| 11  | Aquarius            | xuán xiāo<br>(玄枵宫)      | Rat 子            | 980°²                     | CE       | Fa     | 0-0-2-13                             | 90            |
| 12  | Pisces              | Simmah<br>(娵訾宫)         | Pig 亥            | 889°²                     | CE       | Fa     | 0-0-0-7                              | 75            |

Notes

- <sup>1</sup> The History of Liao: Records of the Imperial Camps states that “nabo” is a transliteration of the Khitan term corresponding to the Chinese “imperial residence”, referring to the Liao emperors’ seasonal camps. This political system involved the Liao rulers migrating with the seasons to engage in fishing, hunting, and deliberating state affairs. The system comprised four seasonal nabo camps—spring, summer, autumn, and winter—which moved with the water and grass, forming a mobile political center.
- <sup>2</sup> The straight lines connect the zodiac signs; the Chinese Twenty-Eight Lunar Mansions are represented by circles, with black dots at their centers indicating the reference stars for each mansion; the dashed lines mark the boundaries of the zodiac signs; the thick horizontal line at 0° is the celestial equator; the thick curved line is the ecliptic.

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