

THE DOME AS A MODEL OF THE WORLD: A CONSTRUCTIVE–SEMIOTIC COMPARISON OF THE YURT AND THE PANTHEON

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Abstract. This article presents a comparative historical, architectural, and semiotic analysis of the traditional Kazakh yurt and the Roman Pantheon. The dome is approached not only as a constructive solution, but also as a spatial form in which geometry, habitation, symbolic meaning, and perception are brought into relation. *The aim* of the study is to determine how a shared formal principle, namely a circular enclosure with a central opening, gives rise to different models of centrality in distinct cultural and architectural contexts. The *methodological framework* combines historical and architectural analysis, architectural semiotics, phenomenological interpretation of spatial experience, and a constructive comparison based on existing literature. Such an approach allows examining domed architecture not simply as form or structure, but as a multilayered system of spatial organization. The *findings* show that, despite their external formal similarity, the yurt and the Pantheon represent two different models of centered space. In the yurt, the dome is integrated into a mobile, climate-responsive dwelling environment structured by kinship relations. Its space is organized around the shanyrak, which functions as both a constructive and a symbolic center. In the Pantheon, the dome acquires a monumental character through geometry, the mass of Roman concrete, and the oculus, which organizes light, visual hierarchy, and sacred verticality. The comparison allows domed architecture to be understood not as a neutral typology, but as a multilayered architectural cosmogram in which constructive logic, embodied experience, and cultural meaning remain inseparable.

Keywords: dome; yurt; Pantheon; architectural centrality; shanyrak; oculus; architectural semiotics; embodied perception; historical-architectural analysis; spatial symbolism.

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Introduction

This research employs a multilayered methodological framework designed to examine the Kazakh yurt and the Roman Pantheon as two historically distant yet formally comparable models of centered space. In accordance with the article's central argument, the study is positioned primarily as a historical-architectural and semiotic inquiry, supplemented by literature-based constructive analysis rather than by original engineering simulation. Such a framework enables the analysis of not only the physico-spatial characteristics of domed architecture but also its cultural, symbolic, and perceptual dimensions within a single comparative framework (Kalelioğlu & Çanakpınar, pp. 1933–1954; Flohr, pp. 65–85).

At the first level, the study conducts a historical-architectural analysis of textual and visual materials, including plans, reconstructions, diagrams, and structural descriptions of both the traditional yurt and the Roman Pantheon. The purpose of this level is not to produce new measurements, but to reconstruct the formal and typological logic of each object through existing scholarship. In the Roman case, the analysis draws on studies of geometric design and construction history that explain the Pantheon through polygonal ordering, proportional coherence, and the technological conditions of Roman concrete dome building (Aung & Bork, pp. 25–48; Flohr, pp. 65–85). In the Kazakh case, the discussion relies on archaeological and cultural-historical studies that trace the continuity of centered dwelling forms and the persistence of circular spatial organization in the architecture of the steppe (Ganiyeva, pp. 48–67).

The second level consists of a semiotic analysis of symbolic structures, with particular attention to the categories of center, opening, vertical mediation, and cosmological orientation. At this level, the shanyrak and the oculus are treated not

simply as constructive apertures, but as culturally encoded centers that organize meaning, hierarchy, and relations between the interior and the exterior, the domestic and the cosmic, the ancestral and the divine. This interpretive layer is grounded in architectural semiotics and in studies that reconstruct the semantic universe of space through oppositions such as vertical and horizontal, surrounding and surrounded, and center and periphery (Kalelioğlu & Çanakpınar, pp. 1933–1954; Adiyeva & Beskempirova, pp. 503–515). It is precisely here that the comparison moves beyond morphology and begins to reveal how similar geometric configurations may be invested with radically different cultural meanings.

The third level involves a constructive comparison based on published literature. Instead of claiming original CFD or FEM modeling, the article analyzes already available research on geometry, material behavior, illumination, and the environmental logic of centered structures. In the Roman case, this concerns the material and technological conditions that enabled large-span concrete domes, as well as the relationship between dome form and the organization of light through the oculus (Flohr, pp. 65–85; Kamble & Gupta, pp. 61–66). In the Kazakh case, the focus falls on the lightweight structural logic of the yurt, including the interrelation of the lattice wall, roof poles, central ring, and climate-responsive enclosure, as reconstructed through historical and archaeological scholarship (Ganiyeva, pp. 48–67). The aim of this level is therefore not numerical verification, but a restrained analytical reconstruction of how structural form conditions habitation, environmental adaptation, and spatial use.

The fourth methodological level is phenomenological and concerns the embodied perception of domed space. Here, the dome is approached not merely as a covering element but as a perceptual regime that modulates light, enclosure,

orientation, bodily scale, and the sensory experience of interiority. This perspective makes it possible to connect formal and symbolic organization with lived spatial effect. In this respect, the Pantheon is examined as a monumental environment of vertical attention and light choreography. In contrast, the yurt is interpreted as an intimate centered space structured by domestic proximity, thermal containment, and the shared axis of the hearth and shanyrak (Asadzadeh Bonabi, pp. 171–187; Kamble & Gupta, pp. 61–66).

The article's central comparative paradox determines the selection of these methodological approaches. Although the yurt and the Pantheon share a circular enclosure and a central opening, they do not represent a single universal type of meaning. Rather, they function as different regimes of spatial centrality – one domestic, mobile, and genealogical, the other monumental, imperial, and cosmological. Their juxtaposition demonstrates that the dome should not be understood as a neutral engineering shell, but as an architectural cosmogram in which geometry, constructive logic, symbolic function, and embodied experience are inseparably intertwined. For this reason, the article deliberately adopts the more methodologically honest format of a historical-architectural and semiotic study with elements of constructive analysis grounded in the literature, while avoiding the fictive empirical contour of unsupported simulation claims.

Methods

This study employs a multilayered methodological framework designed to examine the Kazakh yurt and the Roman Pantheon as two historically distant yet formally comparable models of centered space. In line with the article's main research logic, the methodology is positioned not as an experimental or simulation-based procedure, but as a

historical-architectural and semiotic investigation supplemented by literature-based constructive analysis. Such an approach makes it possible to analyze domed architecture simultaneously as form, structure, symbol, and lived spatial environment, while preserving methodological proportionality between the claims of the article and the actual evidentiary base (Kalelioğlu & Çanakpınar, pp. 1933–1954; Flohr, pp. 65–85).

At the first level, the study applies historical-architectural analysis to textual and visual sources, including plans, reconstructions, structural diagrams, and descriptive studies of both the traditional yurt and the Roman Pantheon. The purpose of this level is to reconstruct the formal and typological logic of each object through existing scholarship rather than to generate new measurements. In the Roman case, the analysis draws on studies of Pantheon geometry and Roman construction history, which explain the building through polygonal ordering, proportional coherence, and the technological conditions of concrete dome construction (Aung & Bork, pp. 25–48; Flohr, pp. 65–85). In the Kazakh case, the discussion relies on archaeological and cultural-historical research that traces the continuity of centered dwelling forms and the persistence of circular spatial organization in the architecture of the steppe (Ganiyeva, pp. 48–67).

The second level consists of a semiotic analysis of symbolic structures, with particular attention to the categories of center, opening, vertical mediation, and cosmological orientation. At this level, the shanyrak and the oculus are treated not merely as constructive apertures, but as culturally encoded centers that organize meaning, hierarchy, and relations between the interior and the exterior, the domestic and the cosmic, the ancestral and the divine. This interpretive layer is grounded in architectural semiotics and in studies showing how built form generates

a semantic universe through oppositions such as vertical and horizontal, surrounding and surrounded, and center and periphery (Kalelioğlu & Çanakpınar, pp. 1933–1954; Adiyeva & Beskempirova, pp. 503–515). Such a level is essential to the article because it demonstrates that morphological similarity does not imply symbolic equivalence.

The third methodological level involves a comparative constructive analysis based on published literature. Rather than claiming original CFD or FEM modeling, the article analyzes existing research on geometry, material behavior, illumination, and the environmental logic of centered structures. In the Roman case, this includes the material and technological conditions that enabled large-span concrete domes, as well as the relationship between dome form and the organization of light through the oculus (Flohr, pp. 65–85; Kamble & Gupta, pp. 61–66). In the Kazakh case, the focus falls on the lightweight structural logic of the yurt, including the interrelation of the lattice wall, roof poles, central ring, and climate-responsive enclosure, as reconstructed through historical and archaeological scholarship (Ganiyeva, pp. 48–67). The purpose of this level is therefore not numerical verification, but a restrained reconstruction of how structural form conditions habitation, environmental adaptation, and spatial use.

The fourth level is phenomenological and concerns the embodied perception of domed space. Here, the dome is approached not simply as a covering element, but as a perceptual regime that modulates light, enclosure, bodily orientation, and sensory experience (Nurkusheva & Ashimova, pp. 294–299). This perspective makes it possible to connect formal and symbolic organization with lived spatial effect. Within this framework, the Pantheon is interpreted as a monumental environment of vertical attention, light choreography, and cosmological orientation. In contrast, the

yurt is understood as an intimate-centered space structured by domestic proximity, thermal containment, and the shared axis of hearth and shanyrak (Asadzadeh Bonabi, pp. 171–187; Kamble & Gupta, pp. 61–66; Proietti et al., pp. 339–342).

The article's central comparative paradox guides the selection of these methodological approaches. Although the yurt and the Pantheon share a circular enclosure and a central opening, they do not represent a single universal type of meaning. Rather, they function as different regimes of spatial centrality – one domestic, mobile, and genealogical, the other monumental, imperial, and cosmological. Their juxtaposition demonstrates that the dome should not be understood as a neutral engineering shell, but as an architectural cosmogram in which geometry, constructive logic, symbolic function, and embodied experience are inseparably intertwined. For this reason, the study deliberately adopts a more methodologically consistent format of a historical-architectural and semiotic inquiry, with elements of constructive analysis based on the literature, while avoiding unsupported empirical claims such as questionnaires, interviews, or original simulation modeling.

Discussion

Existing scholarship on domed architecture may be divided into several partially disconnected strands, each of which clarifies an important aspect of the problem but rarely enters into sustained dialogue with the others. One line of research addresses geometry and constructive logic. In the Roman case, studies of the Pantheon reconstruct its proportional order through polygonal operations and situate its dome within the technological history of Roman concrete construction (Aung & Bork, pp. 25–48; Flohr, pp. 65–85). In the steppe context, archaeological and historical studies trace the continuity of

centered dwelling forms in Kazakhstan and emphasize the persistence of circular plans, central hearths, and climate-responsive building traditions (Ganiyeva, pp. 48–67). These works explain how such structures stand and endure, yet they do not, by themselves, account for how centered form acquires symbolic or perceptual force.

A second strand concerns the semiotics of the architectural center. Research on Kara Shanyrak demonstrates that, in Kazakh cultural discourse, the roof ring is not merely a structural element but also a sign of ancestral continuity, sanctity, inheritance, and domestic centrality (Adiyeva & Beskempirova, pp. 503–515). More general studies in architectural semiotics show that built form may be interpreted through oppositions such as vertical and horizontal, surrounding and surrounded, thereby disclosing a building's semantic universe rather than only its technical composition (Kalelioğlu & Çanakpınar, pp. 1933–1954). However, this body of scholarship usually remains detached from constructive description and from the environmental logic of domed structures.

A third strand focuses on perception and embodied spatial experience. Phenomenological approaches argue that architecture is encountered not as neutral geometry but as embodied meaning structured by orientation, enclosure, and immediate perception (Asadzadeh Bonabi, pp. 171–187; Proietti et al., pp. 339–342). In relation to the Pantheon specifically, light-centered readings show how the oculus transforms the interior into a choreographed field of illumination and sacred attention, making the dome perceptually active rather than merely tectonic (Kamble & Gupta, pp. 61–66). Yet such studies tend to remain either within contemporary phenomenological vocabulary or within isolated descriptions of visual effect, without being fully reintegrated into the historical and material logic of dome construction.

Taken together, these strands reveal a clear methodological fragmentation. Studies of construction and geometry explain how domes are formed and stabilized; semiotic studies explain how centers signify; phenomenological accounts explain how enclosed volumes are sensed and inhabited. What remains underdeveloped is an integrated comparison capable of relating structural logic, symbolic centrality, and embodied experience within a single analytical frame. This gap is especially significant in relation to the Kazakh yurt and the Roman Pantheon, since both rely on circular enclosure and a central opening, yet mobilize these features within radically different architectural, social, and cosmological regimes.

The present study addresses this gap through a triangulated comparison of three mutually related dimensions: historical-architectural form, semiotic centrality, and literature-based constructive analysis, supplemented by a phenomenological reading of spatial experience. Within this framework, the shanyrak and the oculus are treated not as superficially analogous details, but as distinct regimes of centered mediation. The yurt emerges not simply as a shelter adapted to climate, but as a domestic cosmogram in which kinship, hearth, and vertical orientation converge (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67). The Pantheon, by contrast, appears not simply as a technical dome, but as a monumental synthesis of geometry, concrete technology, and light-centered cosmology (Aung & Bork, pp. 25–48; Flohr, pp. 65–85; Kamble & Gupta, pp. 61–66). The dome is therefore approached here not as a static shell, but as a multi-level architectural environment in which form, meaning, and perception are inseparably intertwined (Figure 1).

In contrast, the Pantheon may be understood as a monumentally centralized and visually sacral structure in which the function of the center is displaced

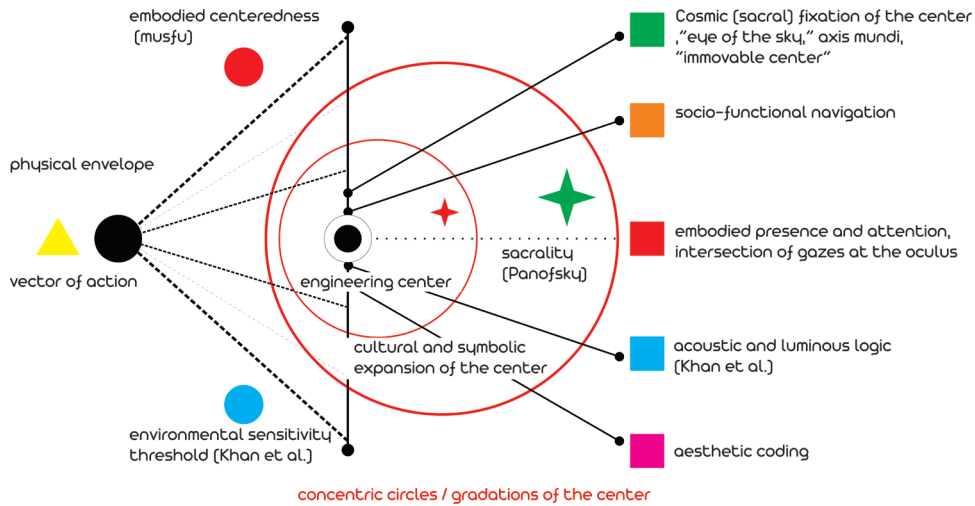


Figure 1. Multilayered architecture of the dome: intersections of engineering, perception, and symbolic centering

upward into a cosmological axis. Rather than organizing domestic life around a habitable core, the building directs attention toward the oculus, where light, height, and enclosure are combined into a regime of vertical orientation. In this sense, the center is not bodily occupied but perceptually contemplated from below. The Pantheon therefore stabilizes centrality as an object of visual and symbolic concentration rather than as an immediate social or thermal focus (Aung & Bork, pp. 25–48; Kamble & Gupta, pp. 61–66; Flohr, pp. 65–85).

From this perspective, the comparison between the yurt and the Pantheon goes beyond mere morphological resemblance and reveals two distinct paradigms of architectural centrality. In the Kazakh yurt, the center is organized through corporeal and domestic functions: heat retention, proximity, kinship distribution, and the vertical mediation of the shanyrak above the shared interior. In the Pantheon, by contrast, centered form is monumentalized and abstracted into a cosmological order articulated through geometry, concrete mass, and the choreographed operation of light. The distinction is visible not only at the level of perception but also in constructive logic: the yurt is assembled through interdependent lightweight

elements that generate centered space from inhabitation outward, whereas the Pantheon consolidates centered space through fixed material mass, geometric control, and imperial building technology (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Aung & Bork, pp. 25–48; Flohr, pp. 65–85).

Such a comparison allows architecture to be understood not merely as a physical enclosure, but as a multi-layered coding system in which structural, symbolic, and perceptual dimensions remain inseparable. One of the central aims of this study is therefore to demonstrate that domed forms should not be reduced to either technical efficiency or abstract symbolism in isolation. What is at stake is the relation between geometry, inhabitation, and meaning: the way in which a centered form may organize bodily conduct, perceptual hierarchy, and cultural identity at the same time (Kalelioğlu & Çanakpınar, pp. 1933–1954; Canetti, Yaffe & Langenthal, pp. 32–39).

Within this framework ((Figure 2), the yurt is approached not as a merely technical shelter, but as a domestic cosmogram whose spatial logic binds together kinship, thermal containment, and symbolic continuity. The shanyrak, while materially involved in regulating smoke and

organizing the roof structure, also functions as a sign of ancestral continuity and the ritual center of the dwelling. The Pantheon, conversely, transforms the central opening into a device of monumental perception: the oculus structures light, scale, and vertical attention, turning the interior into a field of visual sacrality rather than domestic enclosure. The comparison thus shows that a similar formal principle – circular enclosure with a central opening – may encode radically different spatial regimes: one intimate, genealogical, and inhabited; the other monumental, imperial, and cosmologically staged (Adiyeva & Beskempirova, pp. 503–515; Kamble & Gupta, pp. 61–66; Asadzadeh Bonabi, pp. 171–187).

If required, a brief concluding remark may note that the yurt continues to survive in contemporary cultural imagination as a sign of local identity and architectural memory. However, such a line should remain strictly secondary to the article’s main analytical corpus, which is centered on the historical-architectural and semiotic comparison of the yurt and the Pantheon rather than on tourism or branding discourse.

In the Kazakh context, the dome continues to serve as a spatial and symbolic center. Yet, this centrality is organized

through domestic life, kinship continuity, and embodied inhabitation rather than through monumental visual authority. Studies of Kara Shanyrak show that the roof ring functions not merely as a structural element but also as a sign of ancestral transmission, familial legitimacy, and the continuity of the household across generations (Adiyeva & Beskempirova, pp. 503–515). In this respect, the central opening is inseparable from the dwelling’s social and ritual logic.

By contrast, the Pantheon may be interpreted as a monumentally centralized and visually sacral structure in which the center is displaced upward into a cosmological axis. Rather than organizing everyday life around a habitable core, the building directs attention toward the oculus, where light, height, and enclosure are combined into a regime of vertical orientation. The center is therefore not bodily occupied but perceptually contemplated from below. In this sense, the Pantheon stabilizes centrality as an object of visual and symbolic concentration rather than as an immediate thermal or domestic focus (Aung & Bork, pp. 25–48; Kamble & Gupta, pp. 61–66; Flohr, pp. 65–85).

From this perspective, the comparison goes beyond morphology and reveals

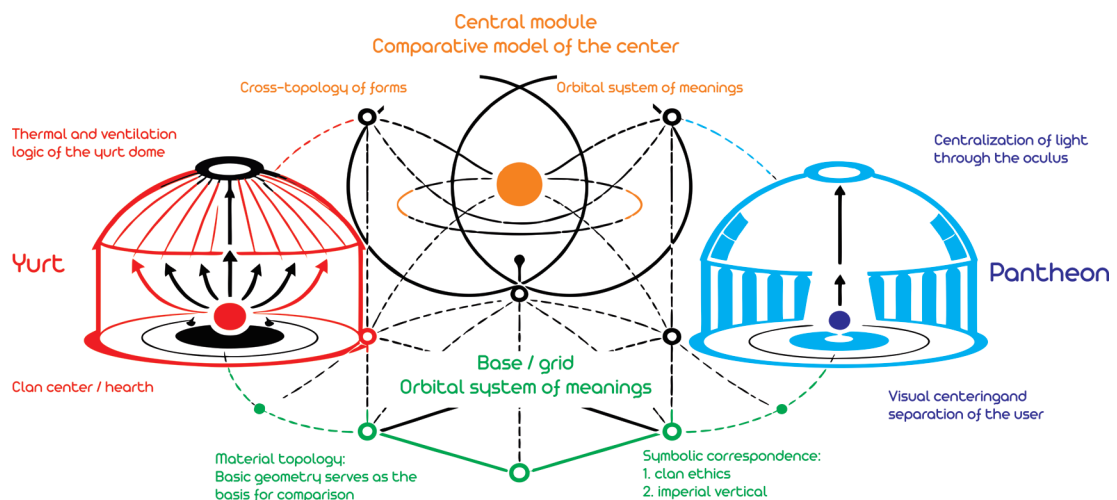


Figure 2. Comparative architectures of the center: from clan embodiment to imperial verticality

two different paradigms of architectural centrality. In the yurt, centered form is organized through corporeal and domestic functions: heat retention, proximity, kinship distribution, and the vertical mediation of the shanyrak above the shared interior. In the Pantheon, by contrast, centered form is monumentalized and abstracted into a cosmological order articulated through geometry, concrete mass, and the choreographed operation of light. This distinction is visible not only at the level of perception but also in constructive logic: the yurt is assembled through interdependent lightweight elements that generate centered space from inhabitation outward, whereas the Pantheon consolidates centered space through fixed material mass, geometric control, and imperial building technology (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Aung & Bork, pp. 25–48; Flohr, pp. 65–85).

Domed forms also possess a specific capacity to shape sensorial environments. Phenomenological studies emphasize that enclosed architecture is experienced not as neutral geometry but as embodied space structured through light, enclosure, bodily orientation, and perceptual hierarchy (Asadzadeh Bonabi, pp. 171–187; Canetti Yaffe & Langenthal, pp. 32–39). In the Pantheon, this takes the form of vertical awe and light-centered visual concentration. In the yurt, by contrast, centered space is constituted through warmth, smoke circulation, acoustic intimacy, and shared bodily presence around the hearth. The dome is therefore not merely a structural unit, but a cognitive environment in which geometry modulates behavior and attention without explicit instruction.

Such a comparison allows us to move beyond the conventional understanding of architecture as a simple enclosure and to approach it instead as a multi-layered coding system in which structural, symbolic, and perceptual dimensions

remain inseparable. One of the central aims of this study is precisely to demonstrate that domed forms should not be reduced either to technical efficiency or to abstract symbolism taken in isolation. What is at stake is the relation between geometry, inhabitation, and meaning: the way in which a centered form may organize bodily conduct, perceptual hierarchy, and cultural identity at the same time (Kalelioğlu & Çanakpınar, pp. 1933–1954; Canetti Yaffe & Langenthal, pp. 32–39).

Considering the yurt and the Pantheon as representational models of the center has thus enabled the systematization of several otherwise fragmented approaches – historical-architectural, semiotic, constructive, and phenomenological – within a single comparative framework. The analysis suggests that, despite major differences in scale, era, and function, both structures enact a shared architectural logic of centralization, though in sharply different modalities. In the yurt, centered form is embedded in lived intimacy and in the everyday regulation of heat, kinship, and interior orientation. In the Pantheon, the same formal principle is transformed into sacred spectacle, where geometry amplifies distance, hierarchy, and imperial order. Dome structures should therefore be understood not merely as technical solutions, but as architectural cosmograms: forms that materialize systems of thought, regulate perception, and mediate collective identity.

A comparative reading of the yurt and the Pantheon reveals that their apparent formal similarity conceals two markedly different strategies of architectural centrality. Both structures employ a domed enclosure organized around yet this shared geometric principle is actualized through distinct constructive logics, symbolic codes, and perceptual regimes (Table 1). In the yurt, the central opening is integrated into a lightweight inhabitable system that links ventilation, heat regulation, domestic orientation, and kinship symbolism. In the

Table 1. Comparative analysis of dome functionality: the yurt and the Pantheon

Level	Yurt	Pantheon
Geometric	Circular, modular, body-centred	Hemispherical, axial, monumental
Constructive	Lightweight frame, felt, adaptive opening	Monolithic concrete shell, fixed oculus
Environmental	Ventilation, heat retention, climatic responsiveness	Thermal mass, enclosed stability, light control
Symbolic	Kinship, hearth, ancestral continuity	Imperial order, sacral axis, cosmic hierarchy
Cognitive	Embodied proximity, shared orientation	Vertical contemplation, awe, symbolic distance

Pantheon, by contrast, the oculus operates within a monumental and materially stabilized shell, where the center is displaced upward and articulated through light, verticality, and visual concentration rather than through everyday habitation (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Aung & Bork, pp. 25–48; Flohr, pp. 65–85).

At the geometric level, both cases rely on circular enclosure and an axial opening; however, the internal logic of this geometry differs substantially. The yurt is modular, expandable, and centered around the inhabiting body, with spatial relations organized through the interplay of *kerege*, *uyk*, and *shanyrak*. The Pantheon, by contrast, presents a fixed and highly controlled geometry whose proportions have been reconstructed through a 150-foot circle and polygonal operations governing niches, coffers, and the relationship between the dome and the rotunda (Aung & Bork, pp. 25–48). Thus, what appears to be a common typological feature is in fact the basis for two distinct formal regimes: one adaptive and domestic, the other monumental and absolute.

At the constructive level, the difference is equally pronounced. The yurt is assembled from lightweight interdependent elements whose structural logic is inseparable from portability, climatic responsiveness, and repairability. The Pantheon, conversely, depends on mass, permanence, and the technological capacities of Roman concrete construction.

Research on Roman building technology has shown that the Pantheon must be understood within a wider field of imperial experimentation with concrete domes, material logistics, and the controlled use of aggregates and structural weight reduction (Flohr, pp. 65–85; Vaserman et al., pp. 10847–10847). The contrast, therefore, lies not only in scale or material but in the very idea of how centered space is made: assembled from inhabitation outward in the yurt, stabilized through material mass and geometric command in the Pantheon.

At the symbolic level, both structures function as cosmograms, yet they encode different ontologies of the center. In the yurt, the *shanyrak* signifies ancestral continuity, domestic legitimacy, and the ritual coherence of the household; it is a center that belongs to shared life and kinship transmission (Adiyeva & Beskempirova, pp. 503–515). In the Pantheon, the oculus and dome articulate a center of sacral distance, where the building frames cosmic order through light and height rather than through embodied domestic presence (Kamble & Gupta, pp. 61–66; Flohr, pp. 65–85). The comparison thus demonstrates that the central opening is never merely technical: it is also a symbolic device that organizes how a culture imagines the relation between interior and exterior, earth and sky, body and transcendence (Nurkusheva & Ashimova, pp. 294–299).

At the cognitive and perceptual level, the divergence becomes especially

clear. Phenomenological approaches to architecture suggest that domed space is experienced through bodily orientation, enclosure, light, and sensory hierarchy rather than through abstract geometry alone (Asadzadeh Bonabi, pp. 171–187; Canetti Yaffe & Langenthal, pp. 32–39). In the yurt, spatial awareness is distributed through warmth, smoke movement, acoustic softness, and the horizontal proximity of bodies gathered around the hearth. In the Pantheon, the spatial regime is dominated by upward attention, visual awe, and the dramatic inscription of the sunbeam through the oculus. The former produces intimate embodied centrality; the latter generates contemplative and monumental centrality.

Taken together, these observations suggest that the yurt and the Pantheon should not be treated simply as two examples of domed construction, but as two distinct paradigms of centered architecture. The yurt structures space from within, through inhabitation, kinship, and climatic adaptation. The Pantheon organizes space from above, through geometric control, material permanence, and sacral visibility. Their comparison therefore supports a broader claim: domed forms are not neutral envelopes, but multi-layered architectural systems in which geometry, constructive logic, symbolic order, and embodied perception remain inseparable.

Results

A comparative analysis of the domed forms of the Kazakh yurt and the Roman Pantheon reveals both structural parallels and fundamental differences, allowing these architectures to be understood not merely as engineered enclosures but as distinct spatial regimes of centrality. In both cases, centered space is articulated through a domed envelope and a central opening at the apex – the shanyrak in the yurt and the oculus in the Pantheon. Yet the function of this opening differs substantially. In

the yurt, the shanyrak participates in ventilation, daylight admission, and the symbolic mediation between the domestic interior and the cosmic order; in the Pantheon, the oculus operates within a monumental and materially stabilized shell, where light, height, and enclosure are combined into a regime of vertical orientation and sacral concentration (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Kamble & Gupta, pp. 61–66).

At the constructive level, the divergence is equally pronounced. The yurt is assembled from lightweight interdependent elements whose logic is inseparable from portability, climatic responsiveness, and repairability, whereas the Pantheon depends on mass, permanence, and the technological capacities of Roman concrete construction (Flohr, pp. 65–85; Vaserman et al., p. 10847). Thus, the yurt generates centered space through inhabitation outward, while the Pantheon stabilizes centered space through fixed material mass and geometric control. Visual analysis further confirms these different logics of centrality. In the yurt, the center remains embedded within the lived body of the dwelling, structured around hearth, kinship, and shared orientation; in the Pantheon, the center is displaced upward and contemplated from below as a monumental axis of light and symbolic order (Aung & Bork, pp. 25–48; Kamble & Gupta, pp. 61–66).

At the symbolic and cognitive levels, the contrast becomes even clearer. The yurt is mobile, kinship-centered, and adaptive; its domed form organizes warmth, proximity, and ancestral continuity through the ritual and social significance of the shanyrak (Adiyeva & Beskempirova, pp. 503–515). The Pantheon, by contrast, is monumental, centralized, and visually sacral, transforming the same formal principle into an architecture of cosmic hierarchy and imperial permanence (Flohr, pp. 65–85; Aung & Bork, pp.

25–48). Phenomenological approaches to architecture suggest that such domed forms should be read not as neutral containers, but as embodied spatial environments in which geometry shapes orientation, perception, and behavioral attention (Asadzadeh Bonabi, pp. 171–187; Canetti Yaffe & Langenthal, pp. 32–39). For this reason, the dome is approached here not simply as a technical solution, but as a multi-layered architectural system in which geometric, constructive, symbolic, and cognitive dimensions remain inseparable.

The comparison, therefore, suggests that the architectural difference between the yurt and the Pantheon cannot be reduced to material or scale alone. Rather, these two structures represent different paradigms of centered architecture: in the yurt, space is organized from within, around the hearth, kinship, and climatic adaptation; in the Pantheon, it is organized from above, around geometry, light, and sacral distance. The dome should thus be understood not as a neutral shell, but as an architectural cosmogram that materializes systems of thought, regulates perception, and mediates collective identity (Kalelioğlu & Çanakpınar, pp. 1933–1954; Canetti Yaffe & Langenthal, pp. 32–39).

Basic Provisions

This study is grounded in the premise that architectural form should be understood not merely as a constructive solution, but as a historically and culturally encoded spatial system through which meanings of center, hierarchy, and orientation are materially articulated. Focusing on the dome, the research interprets it as a form of spatial centrality operating simultaneously across geometric, constructive, perceptual, and symbolic registers. The comparative analysis of two distinct architectural typologies – the Kazakh yurt and the Roman Pantheon – is therefore based not only on their formal resemblance as centered domed structures with a

central opening, but also on the divergent historical and cultural logics of centrality that they embody. In the yurt, centered space is organized through mobility, climatic adaptation, kinship distribution, and the symbolic role of the shanyrak; in the Pantheon, it is monumentalized through geometry, concrete mass, light choreography, and sacral verticality (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Aung & Bork, pp. 25–48; Flohr, pp. 65–85).

Methodologically, the study adopts an interdisciplinary yet proportionate framework that combines historical-architectural analysis, architectural semiotics, phenomenological approaches to spatial perception, and literature-based comparative analysis. This framework enables examining domed architecture as a multi-layered system in which geometry, inhabitation, material logic, and cultural meaning remain co-constitutive. The central argument advanced here is that the dome should not be construed as a universally neutral architectural type. Rather, its operative, perceptual, and symbolic functions vary across sociocultural and technological contexts. The juxtaposition of the yurt and the Pantheon demonstrates how one formal archetype – circular enclosure with a central opening – may sustain radically different regimes of spatial centrality: one domestic, embodied, and genealogical; the other monumental, visual, and cosmological (Kalelioğlu & Çanakpınar, pp. 1933–1954; Kamble & Gupta, pp. 61–66; Asadzadeh Bonabi, pp. 171–187).

Conclusion

The present study has shown that domed architecture cannot be reduced to a purely constructive or formal problem. In the cases of the Kazakh yurt and the Roman Pantheon, the dome appears as a multi-layered architectural system in which geometry, material logic, symbolic

centrality, and embodied perception are inseparably intertwined. What initially seems to be a shared typological principle – circular enclosure combined with a central opening – is revealed, through comparison, as the basis for two markedly different regimes of architectural centrality (Aung & Bork, pp. 25–48; Flohr, pp. 65–85).

The analysis has demonstrated that the yurt organizes centered space through mobility, climatic adaptation, kinship distribution, and the symbolic role of the shanyrak. Its center is not abstract or distant, but socially inhabited and materially integrated into everyday life. The Pantheon, by contrast, monumentalizes the center through fixed geometry, concrete mass, and the visual operation of the oculus, transforming centrality into a cosmological and sacral axis articulated through light, scale, and vertical attention (Adiyeva & Beskempirova, pp. 503–515; Ganiyeva, pp. 48–67; Kamble & Gupta, pp. 61–66). In this sense, the yurt may be understood as a domestic cosmogram of kinship and embodied continuity. In contrast, the Pantheon operates as a monumental cosmogram of imperial order and transcendent hierarchy.

The comparison further suggests that differences between these two structures emerge not only at the level of symbolism but also in their constructive and perceptual logic. The yurt produces a centered space from inhabitation outward through lightweight interdependent elements and a climate-responsive enclosure. The Pantheon stabilizes centered space through permanence, structural mass, and geometric control. At the perceptual level, the former fosters intimacy, thermal proximity, and distributed bodily orientation, while the latter generates contemplative distance, visual awe, and vertically organized attention (Asadzadeh

Bonabi, pp. 171–187; Canetti Yaffe & Langenthal, pp. 32–39). Thus, the architectural center is shown not to be simply a geometric point, but a culturally mediated mode of organizing body, meaning, and environment.

The main contribution of this study lies in bringing together several lines of inquiry that are often treated separately – historical-architectural description, semiotic interpretation, and literature-based constructive analysis – within a single comparative framework. Such an approach enables moving beyond the opposition between engineering explanation and symbolic reading. The dome should therefore be understood not as a neutral shell, but as an architectural cosmogram: a form through which cultures materialize different relations between interior and exterior, earth and sky, body and transcendence, domestic order and monumental power (Kalelioğlu & Çanakpınar, pp. 1933–1954; Adiyeva & Beskempirova, pp. 503–515).

At the same time, the scope of the present study remains deliberately limited. It does not claim original engineering modeling, acoustic measurement, or ethnographic fieldwork. Its argument is based instead on a comparative reconstruction of the available literature and on the analytical premise that form, perception, and meaning should be read together rather than in isolation. Further research may deepen this framework through more specialized studies of Kazakh yurt construction, interior zoning, and environmental performance, as well as through more detailed investigations of light, acoustics, and ritual experience in the Pantheon. What this study establishes, however, is a clearer methodological basis for treating domed architecture as a historically variable yet persistently powerful medium of spatial centrality.

Вклад авторов:

Л.Т. Нуркушева – формирование теоретической части текста, работа с источниками и интерпретация полученных данных, анализ и систематизация материала, исполнение практической части исследования.

А.М. Ашимова – определение концепции исследования, выявление круга задач и разработка методологии исследования. Научное редактирование основного текста и аннотации, консультирование и научное руководство.

Авторлардың үлесі:

Л.Т. Нуркушева – мәтіннің теориялық бөлігін қалыптастыру, дереккөздермен жұмыс және алынған мәліметтерді интерпретациялау. Материалды талдау және жүйелеу, зерттеудің практикалық бөлігін орындау.

А.М. Ашимова – зерттеу тұжырымдамасын анықтау, міндеттер ауқымын анықтау және зерттеу әдістемесін әзірлеу. Негізгі мәтінді, аңдатпа мәтінін ғылыми редакциялау, кеңес беру және ғылыми жетекшілік ету.

Authors contribution:

L. Nurkuseva – formation of the theoretical part of the text, work with sources and interpretation of the data obtained. Analysis and systematization of the material, execution of the practical part of the study.

A. Ashimova – defining the research concept, identifying the scope of tasks and developing research methodology. Scientific editing of the main text, abstract text, consulting and scientific guidance.

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КҮМБЕЗ ӘЛЕМНІҢ МОДЕЛІ РЕТІНДЕ: КИІЗ ҮЙ МЕН ПАНТЕОННЫҢ ТАРИХИ-СӘУЛЕТТІК ЖӘНЕ СЕМИОТИКАЛЫҚ САЛЫСТЫРМАЛЫ ТАЛДАУЫ

Аннотация. Мақалада дәстүрлі қазақ киіз үйі мен римдік Пантеонның салыстырмалы тарихи-сәулеттік және семиотикалық зерттеуі қарастырылады. Зерттеу нысаны ретінде күмбез тек конструктивтік шешім ғана емес, сонымен бірге геометрия, қоныстану логикасы, символдық мағына және қабылдау өзара байланысқан кеңістіктік форма ретінде түсіндіріледі. Зерттеудің мақсаты ортақ формалық принциптің, яғни орталық саңылауы бар шеңберлі қоршаудың, әртүрлі мәдени және сәулеттік ортада орталықтанудың өзгеше үлгілерін қалай қалыптастыратынын анықтау болып табылады. *Әдіснамалық негіз* тарихи-сәулеттік талдауды, сәулет семиотикасын, кеңістікті феноменологиялық тұрғыдан түсіндіруді және әдебиетке сүйенген конструктивтік салыстыруды біріктіреді. Осындай тәсіл күмбезді сәулетті тек форма немесе құрылым ретінде емес, кеңістікті ұйымдастыратын көпқабатты жүйе ретінде қарастыруға мүмкіндік береді. *Зерттеу нәтижелері* киіз үй мен Пантеонның сыртқы формалық ұқсастығына қарамастан, олардың орталықтанған кеңістіктің екі түрлі моделін білдіретінін көрсетеді. Киіз үйде күмбез жылжымалы, климатқа бейімделгіш және туыстық қатынастарға негізделген тұрғын ортаның құрамдас бөлігі ретінде көрінеді. Оның кеңістігі шаңырақ төңірегінде әрі конструктивтік, әрі символдық орталық ретінде ұйымдасады. Пантеонда күмбез геометрия, римдік бетон массасы және жарық, визуалдық иерархия мен сакралды вертикальді ұйымдастыратын окулюс арқылы монументалды сипат алады.

Түйін сөздер: күмбез; киіз үй; Пантеон; сәулеттік орталықтылық; шаңырақ; окулюс; сәулет семиотикасы; дене қабылдауы; тарихи-сәулеттік талдау; кеңістіктік символика.

Дәйексөз үшін: Ляззат, Нуркушева, және Айбота Ашимова. «Күмбез әлемнің моделі ретінде: киіз үй мен пантеонның тарихи-сәулеттік және семиотикалық салыстырмалы талдауы». *Central Asian Journal of Art Studies*, т. 11, № 1, 2026, с. 181–197, DOI: 10.47940/cajas.v11i1.928

Алғыс: Авторлар «Central Asian Journal of Art Studies» журналының редакторларына мақаланы баспаға дайындауға көмектескені үшін және анонимді рецензенттерге зерттеуге назар аударып, қызығушылық танытқаны үшін алғысын білдіреді.

Авторлар қолжазбаның соңғы нұсқасын оқып, мақұлдады және мүдделер қайшылығы жоқ екендігін мәлімдейді.

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КУПОЛ КАК МОДЕЛЬ МИРА: ИСТОРИКО-АРХИТЕКТУРНОЕ И СЕМИОТИЧЕСКОЕ СРАВНЕНИЕ ЮРТЫ И ПАНТЕОНА

Аннотация. В статье представлено сравнительное историко-архитектурное и семиотическое исследование традиционной казахской юрты и римского Пантеона. Купол рассматривается не только как конструктивное решение, но и как пространственная форма, в которой взаимосвязаны геометрия, логика обитания, символическое значение и восприятие. *Цель* исследования заключается в том, чтобы определить, каким образом общий формальный принцип, а именно – круговое ограждение с центральным отверстием, формирует различные модели центральности в разных культурных и архитектурных контекстах. *Методологическая основа* объединяет историко-архитектурный анализ, архитектурную семиотику, феноменологическую интерпретацию пространственного опыта и конструктивное сравнение, основанное на существующей литературе. Такой подход позволяет рассматривать купольную архитектуру не просто как форму или конструкцию, а как многослойную систему пространственной организации. *Результаты* исследования показывают, что, несмотря на внешнее формальное сходство, юрта и Пантеон представляют собой две различные модели централизованного пространства. В юрте купол включён в мобильную и климатически адаптивную жилую среду, организованную на основе родственных связей. Пространство строится вокруг шанырака, который выступает одновременно конструктивным и символическим центром. В Пантеоне купол приобретает монументальный характер благодаря геометрии, массе римского бетона и окулюсу, организующему свет, визуальную иерархию и сакральную вертикаль.

Ключевые слова: купол; юрта; Пантеон; архитектурная центральность; шанырак; окулюс; архитектурная семиотика; телесное восприятие; историко-архитектурный анализ; пространственная символика.

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