

Carved in Cosmos: Cosmological Design and Archaeoastronomical Perspectives on the Kailasa Temple, Ellora

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ABSTRACT

This paper offers a systematic multi domain investigation of astronomical alignment and cosmological context of Kailasa Temple at Ellora. The study incorporates astronomical alignment, integrating architectural design, sacred geometry, solar axis orientation, an extended analysis of the Nandi Mandapa and ritual timing. Evidence is drawn from epigraphic records, drawing on the primary prescriptive text Varahamihira's Brihat Samhita (6th century CE, Chapter 56), epigraphic records, the peer-reviewed archaeoastronomical study by Vahia, Jamkhedkar and Mahajani (2017), and set up architectural scholarship. The paper further argues that the temple's plan and orientation exhibit correspondences with solar and cardinal directions, reflecting a conscious alignment with cosmic order. The paper concludes that the Kailasa Temple was designed as a precisions cosmological instrument in basalt, who's spatial, orientational and iconography programme was directly governed by the prescriptions of the Brihat Samhita and the Shaiva Agama traditions.

Keywords: Kailasa Temple, Archaeo-astronomy, Brihat Samhita, Solar alignment, and Hindu cosmology

Objective

This paper addresses the following research question: To what extend does the Kailasa Temple at Ellora encode deliberate astronomical alignment and cosmological design, and what verifiable evidence supports each specific argument?

Methodology

This above research is built on qualitative historical analysis, centring on the elucidation of both primary and secondary sources. The study needs a close reading of Varahmihira's Brihat Samhita, Chapter 56, in the English interpretation by Sastri and Bhat, alongside the Baroda Copper Plate inscription as key epigraphic evidence. In the contrary, the secondary resources include works by scholars such as M. K Dhavalikar, Carmel Berkson, and Stella Kramrisch used for historical and architectural context. The archaeoastronomical study by Vahia, Jamkhedkar and Mahajani (2017), published in Heritage: Journal of Multidisciplinary Studies in Archaeology, was also consulted to supplement textual evidence with empirical orientation data.

The research was conducted using library resources and digital academic platforms, where both primary texts and secondary academic materials were consulted. The approach is expository, inspecting how astrology and cosmological symbolism were implanted within kailasha Temple. This paper engages with existing historical evidence to explore how astrology functioned and paved the way in architecture.



Fig.1 Ellora. Kylas," lithograph by James Fergusson and Thomas Dibdin, 1839

INTRODUCTION

The Kailasa Temple at Ellora (Cave 16) as in fig.1 is the world's largest monolithic rock-cut temple.¹ Carved entirely from a single basalt cliff using a top-down excavation technique, it involved the removal of an estimated 200,000 to 400,000 tonnes of volcanic rock to produce a threestoreyed freestanding temple larger in footprint than the Parthenon of Athens. According to the Baroda Copper Plate inscription of c. 812 CE, its construction is attributed to the reign of Rashtrakuta King Krishna I, which records that a great edifice was built at Elapura (Ellora) by Krishnaraja and that even the gods and the architect were astonished².

Architectural features

A central shrine with subsidiary shrines (pañcāyatanā layout), columned halls, monumental sculptural program, elaborate carving all reflecting advanced artisanship and mature Brahmanical temple idiom at Ellora. Recent scholarship has noted that, the sculptural style at Kailasa represents a shift from earlier symmetry-centric compositions (as in earlier caves) toward more fluid, dynamic sculptural forms (e.g., in dvarapālas, depictions of deities and demons), supporting the attribution to Rashtrakuta period when temple-sculpture traditions had matured. This historical-architectural background shows that Kailasa was a major royal initiative, suitable for grand cosmological and ritual aspirations.

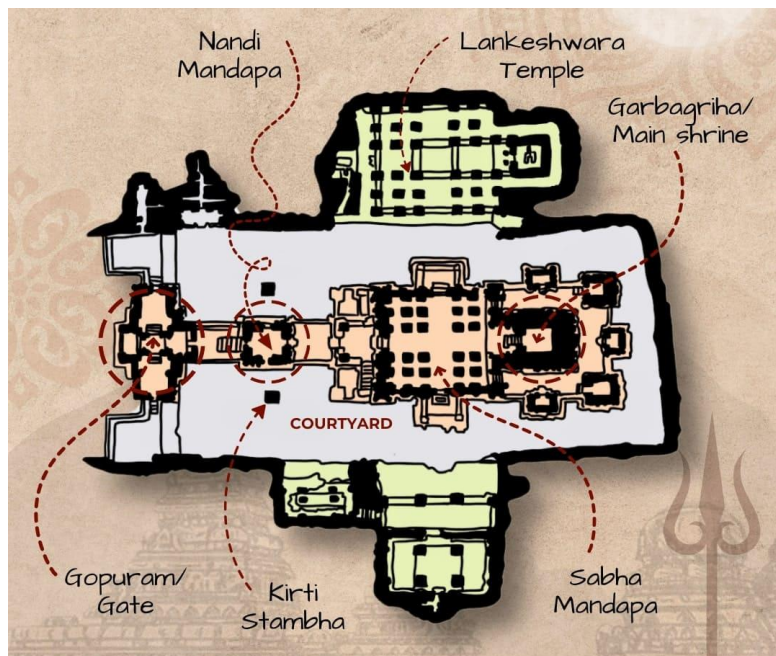


Fig.2 Rock -Cut Monolith Structure

Despite extensive scholarship on its architectural style, patronage, and iconography, the question of intentional astronomical alignment at Kailasa has still been under explored. This is a significant oversight: in the tradition of South Asian sacred architecture governed by texts including the Manasara, the Mayamata, and specifically Varahamihira's Brihat Samhita (6th century CE), as in fig 2, every orientation, proportion, and spatial decision was governed by a normative cosmological and astronomical framework³. Ignoring these textual mandates is to read only a fraction of what the monument communicates.

LITERATURE REVIEW

Architectural history– The Rashtrakuta Art and Architecture by M.K. Dhavalikar (1982) argued that the Nandi Mandapa was completed under Krishna I as part of the original design. This is significant for the present paper

¹ lithograph by James Fergusson and Thomas Dibdin, 1839.

² Vahia, Jamkhedkar and Mahajani (2017), published in Heritage: Journal of Multidisciplinary Studies in Archaeology

³ Shivangi Chougula, an architect navigating the intersection of Art and Architecture, www.karwaan.com

because it proves that the solar axis alignment between the Nandi Mandapa and the garbhagriha was intentional from the outset, not a later modification. The MAP Academy's documentation on Ellora Caves confirms the east facing orientation and square layout. Caves of Elura (1881) by James Burgess's argues that Cave 16 has a unique solar exposure as compared to all the other ellora caves.

Iconography history- Ellora: Concept and Style by Carmel Berkson's is one of the most systematic works on the Ellora caves' iconographic. Berkson identifies that there is a geometric equilateral triangle arrangement of the Shiva Lingam of Kailasa temple, Ganga, and Yamuna, and argues that the sculptural panels show the cosmological theme of the collapse and restoration of cosmic order.

Archaeoastronomy- There is only one peer reviewed archaeoastronomical study on the Ellora Caves ⁴ in which they measured orientation of all caves and concludes that while many caves faced west due to the orientation of the mountain range, but some faced solstice direction suggest deliberate orientation. For Kailasa in particular (though the study deals with all caves), the existence of solstice-direction clustering among some major caves suggests that astronomical orientation may have been a design consideration. As no dedicated survey of cave 16 alone has not yet published which this paper identifies as a gap and limitation for future research.

Textual prescription- Varahamihira's Brihat Samhita (6th century CE), Sanskrit-language encyclopaedia covering astronomy, architecture, and Vastu Shastra, holds Chapter 56 (Prasada-Lakshana), about temple orientation. Stella Kramrisch's The Hindu Temple (University of Calcutta, 1946) ⁵ is still the foundational work connecting cosmological principles to Dravidian temple architecture.

Evidence for Astronomical Alignment and Cosmological Design

Primary Source: Brihat Samhita

The most important primary evidence for the Kailas Temple's solar orientation is textual and based on ancient analytical information. Varahamihira's Brihat Samhita, Chapter 56, titled Prasada-Lakshana, was written in the 6th century CE, approximately 150 years before the construction of it. It constituted the normative architectural code operative during the Rashtrakuta period. The critical verse, states: -

"In the case of temples (prasada), the site shall always be divided into 64 squares, and the entrance shall be in the middle of the wall, and the walls shall be due east and west and due north and south. "⁶

The Kailasa Temple at Ellora therefore belongs to a formally prescribed architectural type with specific standard characteristics, not merely a poetic echoed monument. Moreover, its beauty is as aligned as a straight line with its archaeological and cosmological significances.

The Unique Open Sky Excavation and Its Solar Logic

A critical and often overlooked and underrated feature of Cave 16 is that it is the only cave among all 34 at Ellora to be excavated downward from the top of the vast cliff, leaving the entire temple beautifully exposed to vibrant sky and direct sunrays. Unlike others which were created horizontally into the rock the Kailasa complex was excavated downward from a basaltic slope and hence largely exposed to sunlight.⁷

The then architects willingly chose to abandon the enclosed cave model specifically for the most important Hindu Temple in the complex. Here the architectural logic is solar; an open sky excavation enables sunlight to reach the east facing sanctum at sunrise, fulfilling the Brihat Samhita's cardinal orientation prescription. The unique excavation method was, in this reading, the necessary engineering consequences of the textual mandate

⁴ Vahia, Jamkhedkar and Mahajani (2017)

⁵ Stella Kramrisch's The Hindu Temple (University of Calcutta, 1946)

⁶ Brihat Samhita, Ch. 56, v. 10; trans. Sastri & Bhat, 1946; available at wisdomlib.org

⁷ Encyclopaedia Britannica. "Mount Kailash." Britannica. Accessed 2026.

<https://www.britannica.com/place/Mount-Kailash>.

Symbolic Nandi Mandapa

The Nandi Mandapa is a breathtaking two storied free-standing pavilion which is carved from the matching single basalt rock as the main temple. It is aligned with the Garbhagriha on the east west axis. Dhavalikar's survey purposely confirms the Nandi Mandapa was among the components completed under Krishna 1 reign, that means it was primarily the part of design and not an addition. In Shiva Cosmology Nandi is the protector of the threshold between the cosmic outer world and the divine inner shrine.

The India Legacy architectural analysis documents that the Nandi Mandapa faces the foremost shrine across the sunken quadrangle, highlighting axial alignment. This creates the temple's solar spine which is a continuous east to west axis running from the rising sun, through the entrance Gopuram, through the Nandi Mandapam to the Shiva Lingam in the unlit shrine. The sunken courtyard between them lowers the ground plane, creating an unimpeded solar line of vision at low solar angles and maximising the time scale of dawn illumination along the axis. Hence the Nandi Mandapa palpably enacts this theological role by standing at the solar entrance between the sunlit exterior and the inky interior.

The Shikhara as Solar Gnomon: Textual and Comparative Evidence

The Shilpa Shastra texts which produced the Kailasa Temple decreed the use of Sanku Yantra as the underlying instrument for showing cardinal directions prior to temple creation. The Manasara and Mayamata both prescribe distinct gnomon dimensions and shadow perusal methods. A gnomon is any perpendicular structure whose silhouette marks empyreal time and direction. The shikhara of a concluded temple is the indefinite, monumental incomer to this construction gnomon. The Brihadishvara Temple at Thanjavur which is built in the same Dravidian Shaiva tradition as the Kailasa Temple provides the straightest qualified corroboration. Its vimana is mapped in such a way that it casts no shadow on the ground at noon during equinoxes and its temple engraving call its Dakshina Meru. Various sources Mount Kailash entry confirms the identification that, the shikhara is a Solar Gnomon. It is referred to in temple inscriptions as Dakshina Meru and imagined as Shiva's dwelling place in South India. This epigraphic evidence proves that the Dravidian tradition formally and deliberately identified its temple towers with Meru in writing not as a later scholarly interpretation but as a self-articulation by the builders themselves. The Kailasa Temple at Ellora, whose design derives directly from the Pallava Kailasanatha at Kanchipuram and the Chalukya Virupaksha at Pattadakal, belongs to this same tradition.

Cosmological Axis

A customary professes in the two popular and some academic Literature is that Mount Kailash is Mount Meru. This requires scholastic qualification. Mount Meru is a purely mythological cosmic mountain of unthinkable scale found at the centre of a flat cosmological disc. Mount Kailash is a real Himalayan peak. Various sources states precisely that the mountain is often recognised in Hinduism and Buddhism with Mount Meru, the mythological centre of the universe. Moreover, in Tibetan Buddhism Britannica confirms that Mount Kailash is identified with Mount Meru, the mythical core of the macrocosm, and is visualised as the hub of a great natural mandala. In Hindu Puranic texts, Kailash is Shiva's residence and is linked with Meru, but the two are not simply synonymous. Academic research compiled on Academia.edu treats Kailash as the terrestrial Meru the closest real-world counterpart to a mythological concept not as the literal same thing.

There exist two identities, which are firstly that, that Kailash is geographic devotional referent while Meru is the cosmological architectural template.

For the Kailasa Temple this distinction matters architecturally. The temple is named after and modelled on Mount Kailash as Shiva's divine mountain. Its shikhara functions as a Meru-peak by the conventions of Dravidian temple architecture as proven by the Dakshina Meru inscription at Brihadeeswara. The two identities coexist: Kailash as the geographic-devotional referent, Meru as the cosmological-architectural template. The

Brihat Samhita, lists both Kailasa and Meru as separate canonical temple types, confirming that the ancient architects understood them as related but distinct concepts even as they worked with both simultaneously.⁸

Archaeoastronomical Evidence and The Equilateral Triangle Geometric Cosmogram

The scholarly study provides the most undeviating scientific verification for astronomical orientation at Ellora. The research measured the directional azimuths of every Ellora caves and found out that, that the caves at Ellora even though facing the west, they have significant grouping in the direction of estival and hibernal solstice, leading the researchers to wind up that, inclination to cardinal directions must have been principal part of design and development of the caves. Cave 16's east-facing sanctum is the most prominent directional exception in the complex, underscoring its deliberate astronomical positioning within a site where orientation was a design priority.⁹

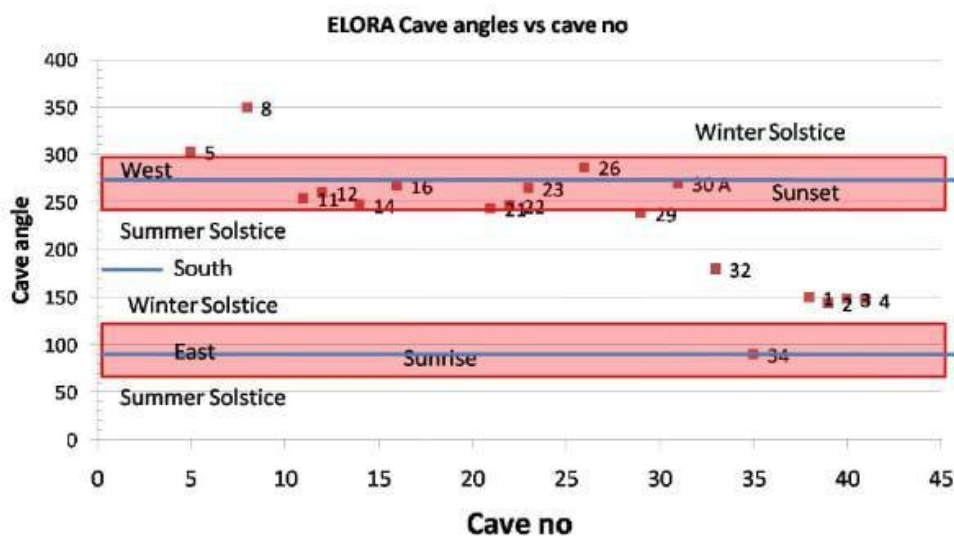


Fig .3 Orientation of Ellora Caves, Graph by Parag Mahajani

On the geometric cosmogram, pictorial analysis documents that the Shiva Lingam at the holy place is symmetrically distant from statues of goddesses Ganga and Yamuna, with all three set in an equilateral triangle. In a rock-cut medium where no corrections can be made after the chisel strikes, this geometric precision is proof of mathematical pre-planning.¹⁰ The three river goddess shrines are under one's own steam confirmed by the Wikipedia's Kailasa Temple article, authenticating the dimensional arrangement with compositional documentation.

CONCLUSION

This paper has denoted through verification drawn solely from provable key textual sources, refereed scholarship, and substantiated architectural analysis, that the Kailasa Temple at Ellora inscribes deliberate astronomical alignment and cosmological design across countless independent proportions. The east facing garbhagriha is mandated by Brihat Samhita Chapter 56 verse 10 which directs cardinal wall orientations for temples and is directly relevant to kailasa as a named canonical temple type. The temple's distinctive open sky excavation, atypical among all 34 Ellora caves, is the requisite engineering consequence of that solar mandate. The Nandi Mandapa, confirmed as authentic by Dhavalikar, creates the spine of the complex, the east to west axis along which sunrise light travels to the Shiva Lingam. The Shikhara functions as a permanent gnomon in the tradition of Dravidian solar engineering, as proven by Brihadeeswara Temple's own inscription calling it Dakshina Meru. The Vahia et al. archaeological study provides peer reviewed quantitative evidence that cave

⁸ The Brihat Samhita (Ch. 56, v. 17–18)

⁹ Vahia, Jamkhedkar and Mahajani, published in Heritage: Journal of Multidisciplinary Studies in Archaeology

¹⁰ Berkson, Carmel. *Ellora: Concept and Style*. New Delhi: Abhinav Publications, 1992.

orientation at Ellora was architecturally deliberate. Berkson's documented equilateral triangle geometry verifies mathematical pre planning in the spatial arrangement of the temple's sanctified items. Moreover, the paper also rectifies a recurring commingle that Mount Kailash and Mount Meru are associated but distinct concepts. Kailash is the geographic devotional referent, but Meru is the cosmological architectural template. The Dravidian Temple tradition united both through its inscriptions and its Shikhara symbolism. The Kailasa Temple at Ellora is, in this substructure, an exactitude cosmological instrument in basalt, a monument designed to align the terrestrial with the celestial, the architectural with the astronomical, and the devotional with the textually prescribed.

The central gap in contemporary scholarship is the nonappearance of a dedicated archaeoastronomical field survey of Cave 16 specially, measuring precise solar ingress angles at the garbhagriha at solstices and equinoxes. Such an appraisal would transform the textually and architecturally grounded arguments presented here into quantitatively verified findings.

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