Executive Summary:

**Cosmic Considerations in Megalithic Architecture:**

An investigation into possible astronomical intent in the design and layout of megalithic monuments of the Indian subcontinent with a view to understanding megalithic knowledge systems

This dissertation discusses the results of investigation of the megalithic structures of the Indian subcontinent for deliberate orientation to directions of astronomical significance. Megaliths are the earliest known examples of construction of monuments on the Indian subcontinent, generally ascribed to the south Indian Iron Age. It was only with the advent of agriculture in the Neolithic in south India (c. 3000BC) that early humans could start living a settled life as an agro-pastoralist. The earliest attempts at monumental architecture in the subcontinent are probably the enigmatic ashmounds of the south Indian Neolithic, though the exact nature and purpose of these structures remain shrouded in mystery. The construction of megaliths – which are a class of features, varied in form, made of locally available stone or sometimes, with earth, are much more widely distributed over the subcontinent than ashmounds, may have started as early as the middle period of the Neolithic, though it appears that their popularity peaked in the subsequent Iron Age (c. 1200BC – 500BC).

A large fraction of megalithic monuments were burials or memorials. However, there are several typologies, such as the megalith type known as stone alignment, which do not fit either description. Such structures typically have several large stones spread over an area of several hundred square meters.

The present work was undertaken to comprehend the understanding of space and knowledge-systems of the creators of these monuments based on the design and layout of these structures. We put special emphasis on the concept of space and astronomy in these megaliths.
In the Chapter 1, we summarise our current understanding of the stages of world prehistory and place the prehistory of the Indian subcontinent in this context. We describe the Age of the megaliths in a separate section to emphasise the cultural context of these monuments in the framework of our understanding of settlement patterns and socio-economic conditions prevailing during the period.

In Chapter 2, we describe the intellectual origins of astronomy in human evolution as understood from studies of prehistoric monuments all over the world and focus on the Indian context, as interpreted from early literary and archaeological sources. We discuss the possible astronomical phenomena – events and cycles that could have been observed and tracked by early man with the unaided eye and the social and technological context of these observations and measurement.

Chapter 3 looks at the design, form and structure of the Indian megaliths in detail and explores the possibilities of intentional orientation of some megalithic types to directions of astronomical significance. We also investigate the specific typologies that could have been designed specifically for astronomical observations. We explore the classification of Indian megaliths and the form of each typology studied in detail, with emphasis on the structural and architectural aspects. The issues of orientation, its measurement, and accuracy of alignments is also discussed. We specifically emphasize the possibilities that isolated menhirs may have been used as gnomons, or may have acted as markers for fore- and back-sights of astronomical sightlines. We also explore the complex megaliths such as stone alignment/avenue and address their relation to astronomy and the cosmos.

Subsequent to this, in Chapter 4, we emphasise the methodology adopted in this investigation to meet the objectives of the present study, which is to identify any intentional alignment or other characteristic in the design of megaliths which may be related to keep track of any astronomical phenomenon. This may include deliberate orientations to astronomical phenomena like sunrise/sunset on certain dates for specific ritual purposes such as mortuary ceremonies and even to mark time by observing the solar/lunar cycle. We follow a two-pronged approach wherein we survey and study orientations in a limited sample of various megalithic types and
study them for intentional orientations. We then compare them with theoretical expectations for alignments intended to study various astronomical phenomena of interest to the megalith-builders by deriving forms for structures that could have been used for astronomical studies. We then give a detailed description of all the study areas and their contexts. We also outline survey and other study methods in this part of the chapter.

Chapter 5 presents the data from the various megalithic sites – including details of the surveys, site features and monument descriptions, orientation and alignment data etc. We analyse the data from various sites and present the details on sites that seem to have astronomical relevance. We discuss the statistical tests used to derive the sightlines to determine whether the observed phenomena could occur due to random chance.

In Chapter 6, we present our major findings and discussion of their relevance in the context of state of knowledge in the field. The major findings of this investigation include the establishment of a new category of megalithic stone alignments detected in two regions geographically removed from each other and the identification of definite astronomical orientations (to the Solstices and possibly the Lunistices) of sightlines in stone alignments in at least two such sites. Minor findings include understanding patterns in orientation of sepulchral megaliths at various localities and the possible correspondence of the same with chronology as guessed from stylistic variations. Another consequence of this investigation is the discovery of two new megalithic sites in the course of our explorations. The monuments where intentional astronomical alignments were observed are compared to similar monuments elsewhere in the country and the world. We also discuss the possibility of using archaeoastronomy for the dating of such sites especially in the context of the poor understanding of the chronology of megalithic monuments in India. We also discuss the possibility of new findings based on these investigations to further understanding of later architecture and astronomy in the region.
In conclusion, we present the new findings from this research and emphasise its relevance to the status of knowledge in the study of megalithic architecture and ancient astronomy in the Indian subcontinent. The directions for future research springing from the current investigation are also outlined – especially with regard to understanding later monumental architecture in the subcontinent – be they sepulchral/memorial stupas, anthropomorphic figures or open-air/structural temples. The architectural and sculptural wealth of this region is exceedingly rich and megalithic structures arguably represent the earliest steps in the development of the human attempts to delineate and use space exclusively for motives that go beyond the mere functional and more of expressions of belief-systems of the builders – be they burial or astronomy. The knowledge of heavenly phenomena and cycles and the influence of these on the design and layout of early terrestrial monumental structures is an essential starting point in our understanding of the concepts behind the development of the form and principles of later architecture, especially of religious and monumental nature in this region.

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