

Srishti Kabbo

Cosmology Museum

Moheshkhali, Cox's Bazar, Bangladesh

By

Sarika Siraj

10108011

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COSMOLOGY MUSEUM

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ABSTRACT

The cosmological journey of this universe begun from darkness, from nothing- as it is seen from human perspective. This journey has been changing its shape through evolution as people started to question everything. Since ancient times the earth has taken two to three to four dimensional shape as we evolved. With all this the universe also took its form of infinite and expanding. This project intends to portray this journey of cosmological thought by experiential spaces which inspires asking questions.

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BACKGROUND OF THE PROJECT

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CHAPTER 01

BACKGROUND OF THE PROJECT

1.1 Project Introduction

For thousands of years people have wondered, speculated, and argued about the origin of the universe without actually knowing anything about it. The scientific discoveries in recent times have unfolded some universal questions about how life originated though it hasn't been able to answer the question why. A story is emerging in modern cosmology that will, if it follows the pattern of earlier shifts in cosmology, change our culture in ways no one can yet predict. It is important to start now to speculate on the possible meanings for our time of this emerging cosmological story. Rather than assuming that science and spirit are separate jurisdictions, I assume that reality is one, and that truth grows and evolves with the universe of which it speaks.

Modern cosmology is now undergoing a foundation-building revolution as it seeks a verifiable description of the nature and origin of the universe. This revolution may require that we transcend previous notions of space, time, and even reality. The research may result into a science whose metaphors may illuminate not only the subject matter of its own field but possibly also problems of humanity and the earth from a cosmic perspective.

From the context of Bangladesh, a little incentive is needed for people to actually think and research on this topic. As the connection between cosmos and human being is inseparable, I believe anyone can participate and contribute new ideas to broaden the horizon of cosmology. The intention of this project is to provide that little incentive in form of experiential spaces which would make people wonder. After all, everything we see today actually did start from someone's imagination.

1.2 Project Brief

Technological advancement has taken man far away from nature for which the connection between man and cosmos is rarely felt. This museum would be a space where this lost connection can be perceived once again. Also the cosmological journey that mankind is on from ancient times is something that is hidden in us, only we don't know of it. The spaces of wonderment would revive those memories once again and provoke enlightenment among visitors.

1.3 Project Rationale

The history of cosmology is written by dreamers. Dreamers who dreamt of solving the mystery of our origin, knowing the big answer to the question 'Who am I' or what our stand is as human beings in this vast space of universe and what is the ultimate fate of this story. I don't think it is too much of a big dream to believe that people of Bangladesh can also contribute something in this process of evolution of mankind's history. Which is why this museum is designed as the little incentive that I believe the people of this country need to think about this topic.

1.4 Aims of the Project

The aim of this project is to provoke thinking, to make people question. The habit that brought people this further on their cosmological journey- questioning everything around them, is once again necessary to revitalize in themselves as technology is taking them far away from the raw natural thought process.

1.5 Proposed Programs

Exhibition space
Learning Centre
Archive
Contemplating space
Multipurpose Hall
Cafeteria
Workshops
Utilities
Administrative office
Souvenir shops

CHAPTER 2

SITE APPRAISAL

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CHAPTER 2

SITE APPRAISAL

2.1 Location of the site

Location: AdinathPahar, Moheshkhali, Coxs' Bazar.

Area: 2,30,000sqft



2-1 Site

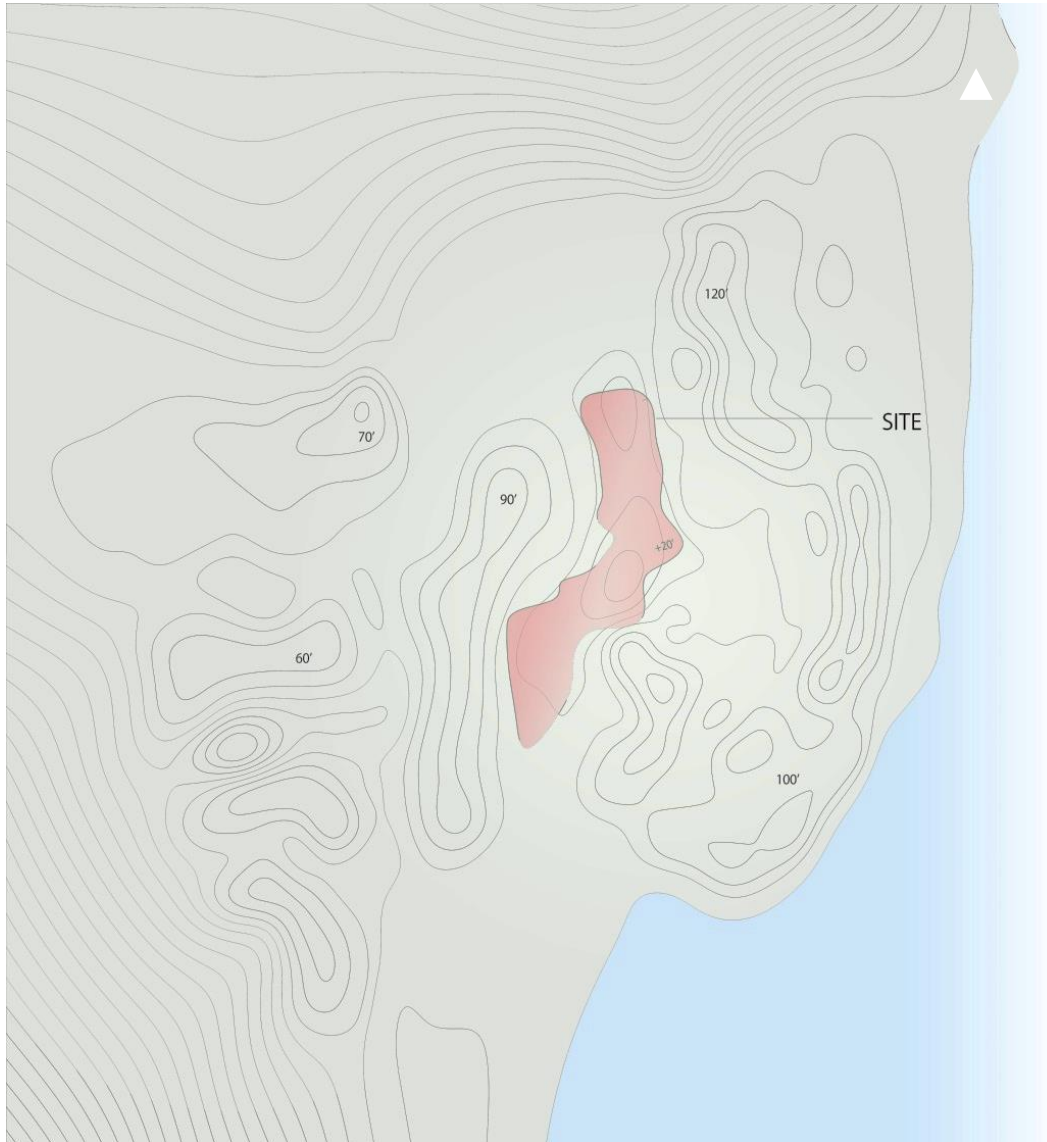


2-2 Top view of Site

The site is situated in Moheshkhali, Coxs' Bazar near Adinath Hill. As the intention of this project is to take people in a space where they can feel the connection with cosmos, so a place without light pollution was necessary to select. As Moheshkhali is an island in Bay of Bengal it has little chance of being light polluted in near future.

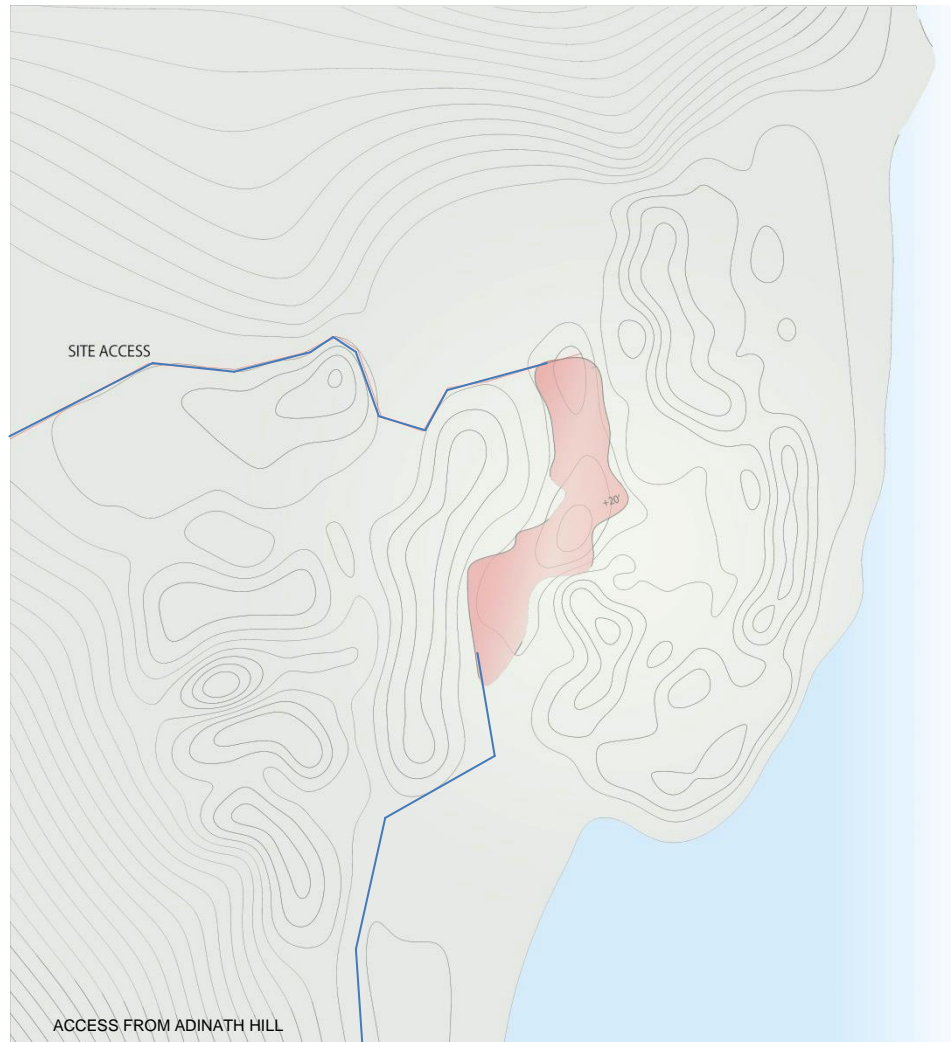
2.2 Topography of site

The site lies in between two mounds of elevation 90' and 120'. It is kind of a valley where the complex would be situated.



2-3 Existing Site Plan

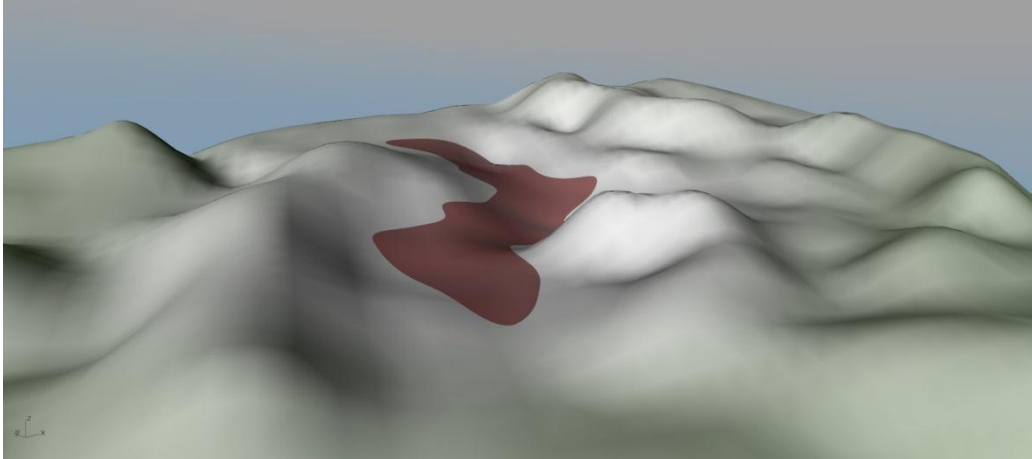
Site can be accessed in two ways. One is from Adinath Hill where people can easily go by a rickshaw and then have to walk for ten minutes. Another is a mud road which is presently used by the farmers.



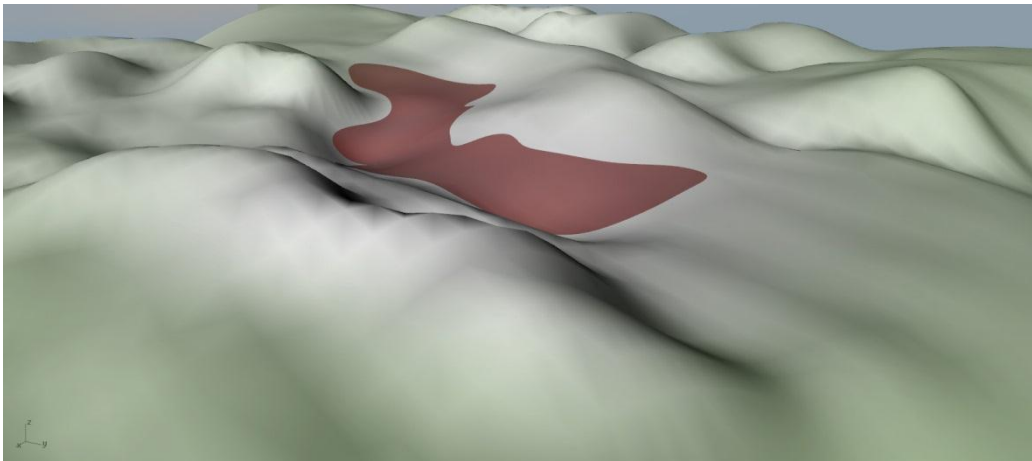
2-4 Site Access

3D view of site

The site is a valley surrounded by small mounds highest elevation of 120'.



2-5 3D view of site (From Adinath Hill)



2-6 3D view of site

Pictures of site



2-7 Panorama



2-8 View from South

Site surrounding



2-9 Sea can be seen on one side from up above



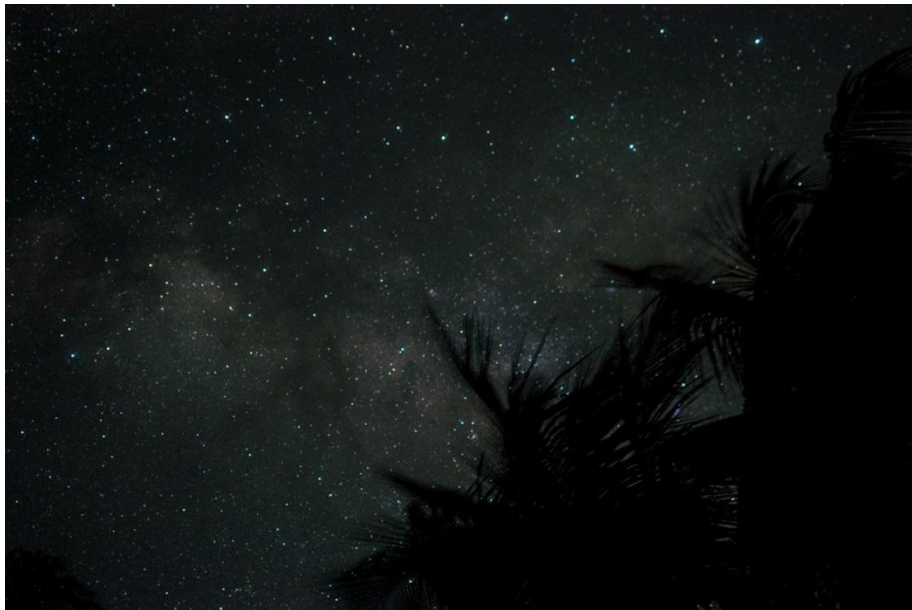
2-10 Paddy fields and water ponds seen on the other side

The situation of light pollution in site:

As Moheshkhali is an island there is minimum chance of the area getting light polluted. This pictures were taken in site at night which proves the site is light pollution free.



2-11 Milky Way can be seen with naked eye on a clear night



2-12 Picture taken from site

2.2 SWOT Analysis

Strength

Natural surrounding without any light or air pollution which is very useful for the project.

Already a tourist destination for which the museum would get visitors automatically.

Weakness

Distance can be a problem for the visitors.

Lack of accessibility.

Opportunity

Would attract more tourist in the site.

The area would get more developed.

Threat

Natural setting can get hurt if the project is designed insensibly.

Too much crowd can harm nature.

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CHAPTER 3

LITERATURE REVIEW

Phases of Cosmological Thinking

Many of the earliest recorded scientific observations were about cosmology, and pursue of understanding has continued for over 5000 years. Cosmology has exploded in the last 20 years with radically new information about the structure, origin and evolution of the Universe obtained through recent technological advances in telescopes and space observatories and basically has become a search for the understanding of not only what makes up the Universe (the objects within it) but also its overall architecture.

Modern cosmology is on the borderland between science and philosophy, close to philosophy because it asks fundamental questions about the Universe, close to science since it looks for answers in the form of empirical understanding by observation and rational explanation. Thus, theories about cosmology operate with a tension between a philosophical urge for simplicity and a wish to include all the Universe's features versus the total complexity of it all.

The evolution of cosmological thinking advanced by scientific skepticism. Mankind went through different phases when they believed in different gods in their journey. The starting of this cosmological evolution started in ancient times when man started thinking and questioning.

3.1 Ancient Times

Ancient man asked questions such as "What's going on around me?" which then developed into "How does the Universe work?", the key question that cosmology asks. Different civilizations grew different theories, myths and stories about creation which resulted in to some supernatural existence on earth.

Neolithic Cosmology:

Cosmology is as old as humankind. Once primitive social groups developed language, it was a short step to making their first attempts to understand the world around them. Very early cosmology, from Neolithic times of 20,000 to 100,000 years ago, was extremely local. The Universe was what you immediately interacted with. Cosmological things were weather, earthquakes, sharp changes in your environment, etc. Things outside your daily experience appeared supernatural, and so we call this the time of Magic Cosmology.

Early people projected their own inner thoughts and feelings into an outer animistic world, a world where everything was alive. Through prayers, sacrifices and gifts to the spirits, human beings gained control of the phenomena of their world. This is an anthropomorphic (magic) worldview, of the living earth, water, wind and fire, into which men and women projected their own emotions and motives as the guiding forces, the kind of world one finds in fantasy and fairy tales.



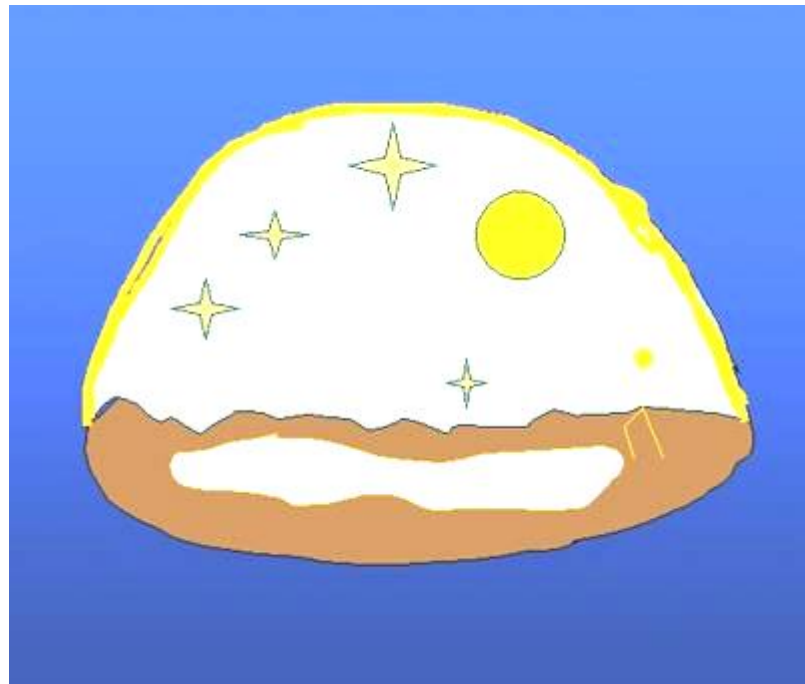
3-1 Cave Painting found in France

Mesopotamian Cosmology:

The Mesopotamian civilizations of Sumer, Babylon, Cannan, and Judea all had a common concept of the cosmos. First, it was based on water as the fundamental primordial

substance. Water was essential to life and perhaps even embodied a vital principle. All living things were wet inside. Water was the only substance known to the ancients that existed in all three phases; liquid, solid, and vapor

The basic feature of Mesopotamian cosmology was the firmament, or vault of heaven, that created a dry space above the Earth. The Earth was a disk, and the firmament rested on the Earth around its edge – as was obvious to any Mesopotamian scanning the horizon. Beneath the Earth were the waters of the abyss. The Earth had some thickness as was obvious from digging and from caves. Within the thickness of the Earth-disk was the underworld. So the world looked like figure 3-2.



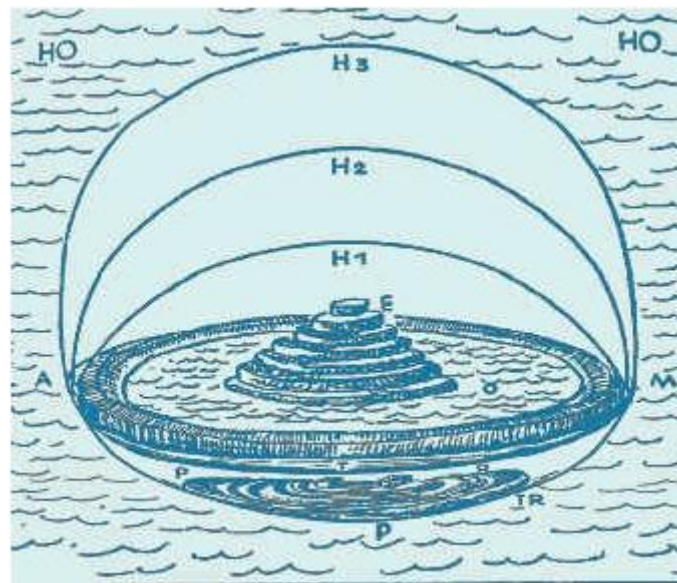
3-2 Ancient Cosmos

Babylonian Cosmology:

Like the other Mesopotamian cosmogonies, Babylon's begins with water. But there are two kinds of water: fresh, deified in Apsu (male), and salt, deified in Tiamat (female). They call into being a whole genealogy of gods. The new gods were noisy and Apsu complains that he gets no rest either by day or night. This is significant since the gods are still existing in the primordial waters; sun, moon, and earth have not yet been created. This shows that the Babylonians were not aware that day was caused by the sun. They thought of day and

night as fundamental and the sun as a mere marker of day. Apsu proposes to kill off the children gods that he and Tiamat have produced. But the gods take measures to prevent this and kill first Apsu and then Tiamat. The latter is accomplished by Marduk who is then the chief god. He splits Tiamat's body in two 'like and oyster'. One half becomes the firmament and the other half becomes the Earth. Tiamat's spittle provides rain and clouds. Her head becomes mountains and out of her eyes flows the Tigris and Euphrates rivers.

The Babylonians had a relatively complex model of the world, as shown in figure 3-3.



3-3. Babylonian universe.

It was a six-level universe with three heavens and three earths: two heavens above the sky, the heaven of the stars, the earth, the underground of the Apsu, and the underworld of the dead. The Babylonians made precise observations and made records; so they recognized the pattern of motion of the heavenly bodies. They attributed this to Marduk.

Egyptian Cosmology:

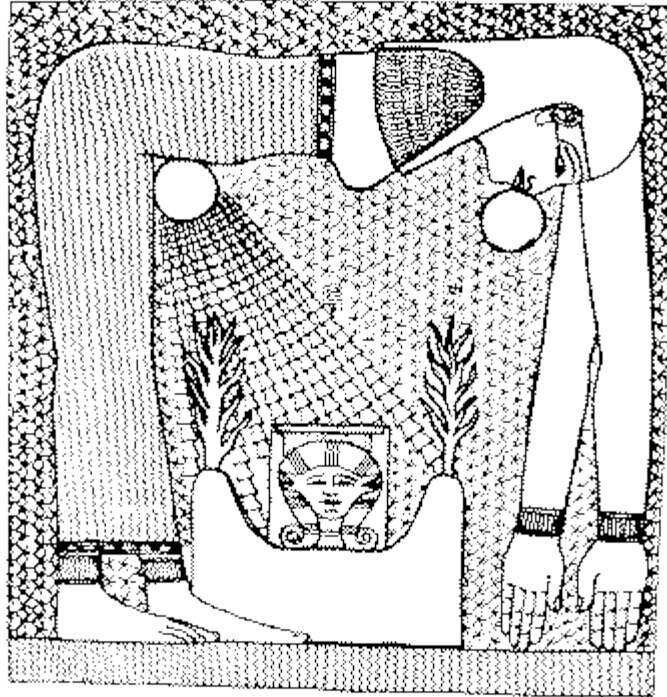
In the region now known as the Mideast, about 5,000 years ago humankind begins to organize themselves and develop the great Bronze Age cultures. These first great civilizations (clustered about the Nile and Euphrates rivers) gave the common man a greater sense of permanence to their daily existences. This leads to the development of myths, particularly creation myths, to explain the origin of the Universe. The development of

cosmology in ancient Egypt followed practical lines. Early man's impressions of the night sky formulated into various myths which then later became the core of Egyptian religion. Since its principal deities were heavenly bodies, a great deal of effort was made by the priesthood to calculate and predict the time and place of their god's appearances. These skills led to the division of the day and night into twelve sections each, the development of a lunar calendar and the development of a solar calendar of 12 30-day months with a special 5-day unit to bring the total to 365 days.



3-3 Egyptian Cosmology

Because the sun god, Ra, was the pre-eminent god, the annual solar motion along the horizon was a key astronomical observation for the Egyptians. The timing and position of the northernmost and southernmost turning points, the solstices, ultimately fixed the mythology of Egyptian cosmology. Egyptian legend declares that the sky goddess Nut gives birth to Ra once a year, catalyzing both calendar development and the concept of divine royalty plus the matrilineal inheritance of the throne.

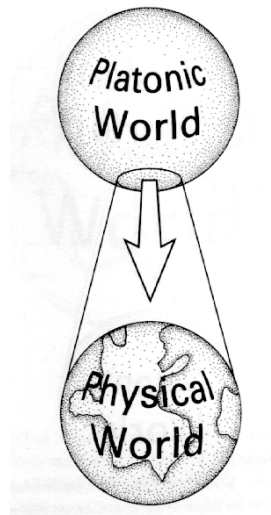


3-4 Sky goddess Nut giving birth to Ra

Greek Cosmology:

Perhaps one of the greatest influences on modern thought are the ideas that arose from Greek philosophy between 600 BC and start of the Roman Empire. The works of scholars from this era will influence philosophers and scientists into the 21st century and many of our modern cosmological frameworks have their root in ancient Greek ideas. While many of our first cosmologies were based on myths and legends, it is the Greek philosophical tradition that introduces an intellectual approach based on evidence, reason and debate. While many of their ideas barely qualify as scientific theories, their reliance on mathematics as a tool to understand the Universe remains to this day.

Idealization of physical phenomenon led Plato to hypothesize that there were two Universes, the physical world and an immaterial world of 'forms', perfect aspects of everyday things such as a table, bird, and ideas/emotions, joy, action, etc. The objects and ideas in our material world are 'shadows' of the forms (see Plato's Allegory of the Cave). This solves the problem of how objects in the material world are all distinct (no two tables are exactly the same) yet they all have 'tableness' in common. There are different objects reflecting the 'tableness' from the Universe of Forms.



3-5 Platonic World vs Physical World

So it is seen the ancient times was mostly the time of darkness when people weren't sure of anything and was looking for a solid explanation to believe in. Most of the myths and theories were made only by what they saw and as they haven't explored the world yet, their views stayed limited in their territories.

3.2 Nature Worshippers

Nature worship is the primitive source of modern religious beliefs. Variations of nature worshipping can be seen depending on regions.

Africa

Animism is practiced among the Bantu peoples of Sub-Saharan Africa. The Dahomey mythology has deities like Nana Buluku, Gleti, Mawu, and Xevioso.

Europe

In Baltic mythology, the sun is a female deity, Saule, a mother or a bride, and Mēness is the moon, father or husband, their children being the stars. In Slavic mythology Mokosh and Mat Zemlya together with Perun head up the pantheon. Celebrations and rituals are centered on nature and harvest seasons. Dragobete is a traditional Romanian spring holiday that celebrates "the day when the birds are betrothed."

India

In Hindu philosophy, the yoni is the creative power of nature and the origin of life. In Shaktism, the yoni is celebrated and worshipped during the Ambubachi Mela, an annual fertility festival which celebrates the Earth's menstruation.

Nature worshipping can be found in the form of of theism, panentheism, pantheism, deism, polytheism, animism, totemism, shamanism, and paganism spread across the world. Common to most forms of nature worship is a spiritual focus on the individual's connection and influence on some aspects of the natural world and reverence towards it.

3.3 Religion

The first organized religions appear to have been based on fertility. They were focused on the worship of the great Earth Goddess. Religion evolved to include male Gods who were gradually given increased importance by the priests. This development may have been caused by developing knowledge of the male's involvement in the process of reproduction.

Today, most people follow either:

A monotheistic religion, in which a single god is worshipped

A henotheistic religion -- a religion which recognizes a single main deity, but which recognizes other gods and goddesses, heroes, or saints as facets or manifestations or aspects of that supreme God.

Polytheistic religion- refers to the worship of or belief in multiple deities usually assembled into a pantheon of gods and goddesses, along with their own religions and rituals.

Most religions teach that they were directly revealed by their deity/deities to humanity, and are unrelated to other world religions. However there is considerable historical evidence from ancient times that religions in the area from India to the Middle East shared many religious beliefs.

World religions at present time-

Hinduism:

Hinduism is generally regarded as the world's oldest organized religion. It consists of "*thousands of different religious groups that have evolved in India since 1500 BCE.*" Because of the wide variety of Hindu traditions, freedom of belief and practice are notable features of Hinduism.

Most forms of Hinduism are henotheistic religions. They recognize a single deity, and view other Gods and Goddesses as manifestations or aspects of that supreme God. Henotheistic and polytheistic religions have traditionally been among the world's most religiously tolerant faiths. As a result, India has traditionally been one of the most religiously tolerant in the world.

Hindus believe in the repetitious *Transmigration of the Soul*. This is the transfer of one's soul after death into another body. This produces a continuing cycle of birth, life, death and rebirth through their many lifetimes. It is called *samsara*. *Karma* is the accumulated sum of one's good and bad deeds. Karma determines how you will live your next life. Through pure acts, thoughts and devotion, one can be reborn at a higher level. Eventually, one can escape *samsara* and achieve enlightenment. Bad deeds can cause a person to be reborn as a lower level, or even as an animal. The unequal distribution of wealth, prestige, health, disability, suffering, etc. are thus seen as natural consequences for one's previous acts, both in this life and in previous lives.

Christianity:

Christianity is the largest religion in the world, with a little over 2 billion members. It is significantly larger than the second largest religion: Islam, which has about 1.6 billion members. About one third of the world's population currently identifies themselves as Christian.

Christians believe that Jesus has a "unique significance" in the world. Most Christians believe that Jesus is the Son of God, fully divine and fully human, and the savior of humanity whose coming was prophesied in the Old Testament. Consequently, Christians refer to Jesus as Christ or the Messiah.

Islam:

Estimates of the total number of Muslims range from 0.7 to 1.8 billion. About 23% of all people on Earth follow Islam. The religion is currently in a period of rapid growth.

Muslims believe that God is one and incomparable and that the purpose of existence is to worship God. Muslims also believe that Islam is the complete and universal version of a primordial faith that was revealed many times before through prophets including Adam, Noah, Abraham, Moses, and Jesus. They maintain that the previous messages and revelations have been partially misinterpreted or altered over time, but consider the Arabic Qur'an to be both the unaltered and the final revelation of God. Religious concepts and practices include the five pillars of Islam, which are basic concepts and obligatory acts of worship, and following Islamic law, which touches on virtually every aspect of life and society, providing guidance on multifarious topics from banking and welfare, to family life and the environment.

Buddhism:

Buddhism was founded in Northern India by Siddhartha Gautama in the sixth century BCE. However, Buddhists believe that there were countless Buddhas -- humans who have achieved enlightenment -- before him and that there will be many more after him. When Siddhartha Gautama attained enlightenment, he assumed the title Lord Buddha (*one who has awakened*)

Buddhism shares with Hinduism belief in karma, dharma, and reincarnation:

Karma is the sum total of an individual's actions of body, speech and mind -- good, bad and neutral -- taken in their current and previous lives.

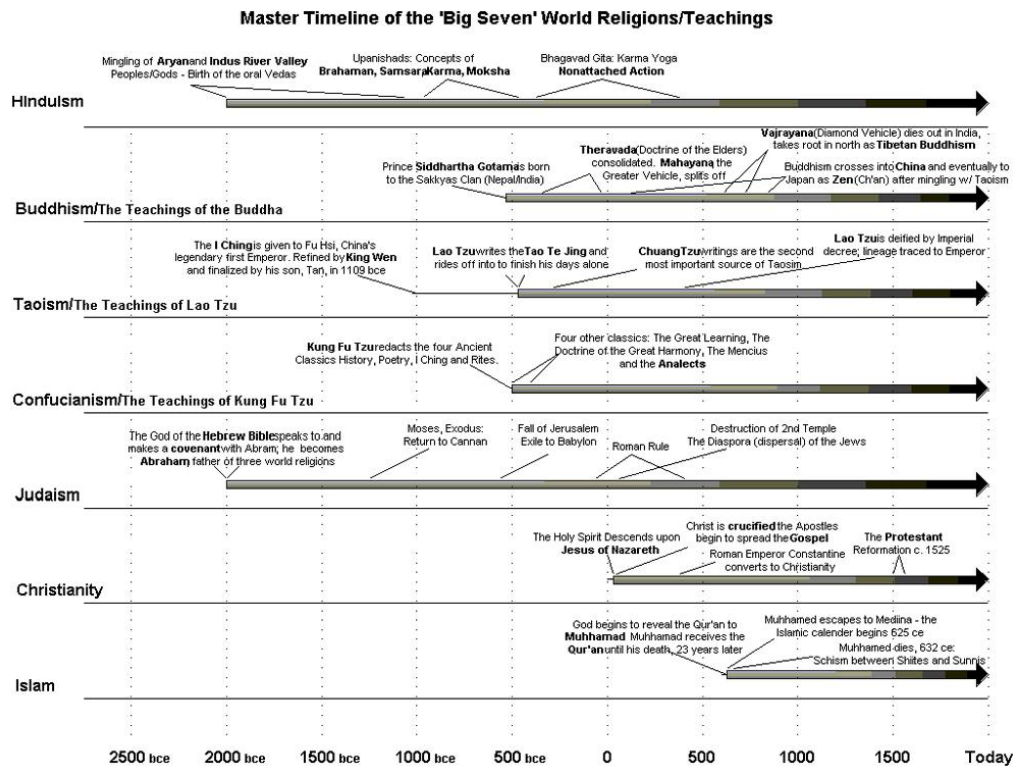
Dharma, in Buddhism, refers to two items:

The teachings of the Buddha; a person's path to enlightenment, and

The fundamental principles that order the universe

Reincarnation is the rebirth of a living being after death into a new body that is either a

human, animal or a supernatural being.



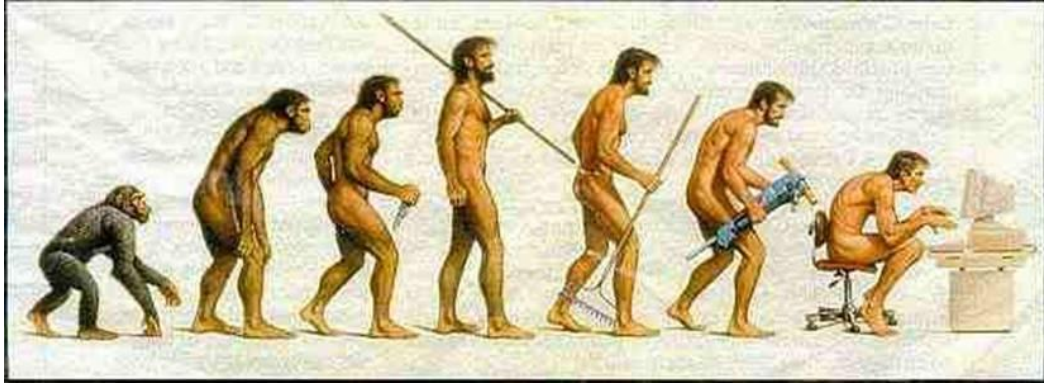
3-6 Timeline of religion

These are the major religions that people follow at present time. Shinto, Sikhism, Judaism, Korean shamanism, Caodaism, Jainism, Hoahaoism, Taoism and many other forms of religion are also followed in different parts of world.

3.4 Post-Religion:

Evolution of religious views led more religions to be born and chaos took over in the views of different people. Some believed in their Gods and fought for them, some stopped believing in anything and some still held on to scientific skepticism by never stopping the search.

The clash between different world view is still going on. Different conspiracy theories are being laid out, wars are being fought over religion and so on. The structure of society and monetary thinking is taking over people's life and people are drifting away from the nature and the core connection with them and universe.

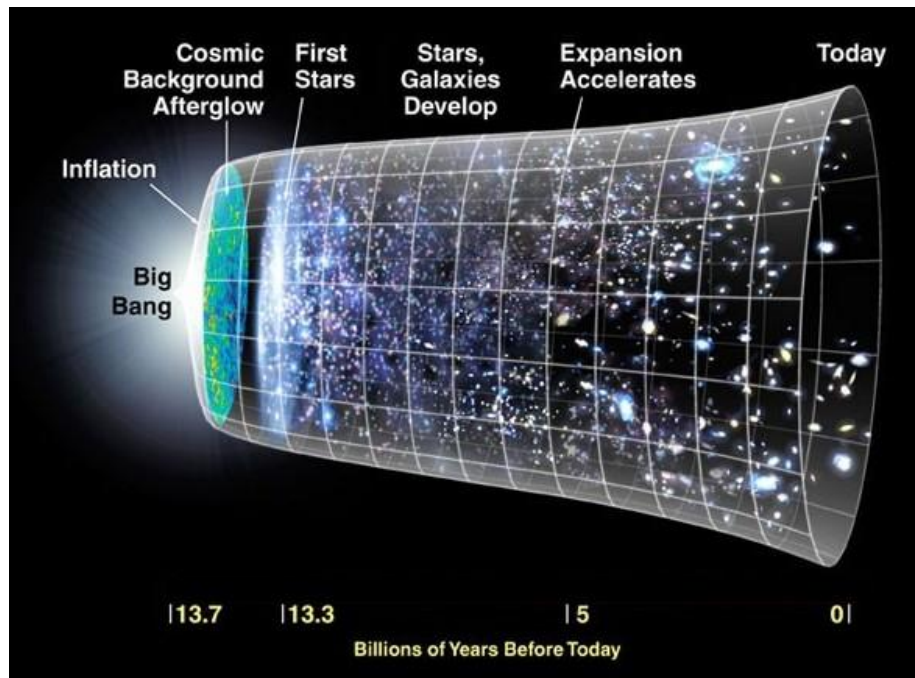


3-7 artists depiction of evolution towards technology

3.5 Scientific views on cosmology

Einsteinian Universe:

The model of the universe assumed by Albert Einstein in his groundbreaking theory of gravity in the early 20th Century was a static, dynamically stable universe which was neither expanding or contracting. However, he had to add in a “cosmological constant” to his general relativity equations to counteract the dynamical effects of gravity which would otherwise have caused the universe to collapse in on itself (although he later abandoned that part of his theory when Edwin Hubble definitively showed in 1929 that the universe was not in fact static).



3-8 Big Bang Model of the Universe

Big Bang Model of the Universe:

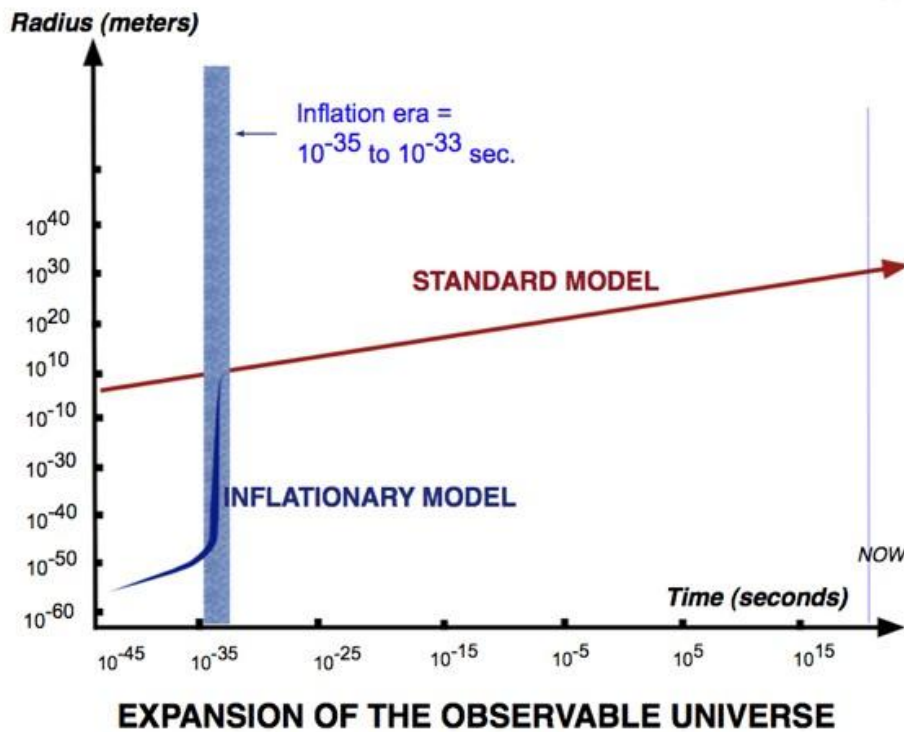
After Hubble's demonstration of the continuously expanding universe in 1929 (and especially after the discovery of cosmic microwave background radiation by Arno Penzias and Robert Wilson in 1965), some version of the Big Bang theory has generally been the mainstream scientific view. The theory describes the universe as originating in an infinitely tiny, infinitely dense point (or singularity) between 13 and 14 billion years ago, from where it has been expanding ever since.

Oscillating Universe:

This was Einstein's favoured model after he rejected his own original model in the 1930s. The oscillating universe followed from Alexander Friedmann's model of an expanding universe based on the general relativity equations for a universe with positive curvature (spherical space), which results in the universe expanding for a time and then contracting due to the pull of its gravity, in a perpetual cycle of Big Bang followed by Big Crunch. Time is thus endless and beginning less, and the beginning-of-time paradox is avoided.

Steady State Universe:

This non-standard cosmology (i.e. opposed to the standard Bang model) has occurred in various versions since the Big Bang theory was generally adopted by the scientific community. A popular variant of the steady state universe was proposed in 1948 by the English astronomer Fred Hoyle and the Austrians Thomas Gold and Hermann Bondi. It predicted a universe that expanded but did not change its density, with matter being inserted into the universe as it expanded in order to maintain a constant density. Despite its drawbacks, this was quite a popular idea until the discovery of the cosmic microwave background radiation in 1965 which supported the Big Bang model.



3-9 Expanding Universe

Inflationary (or Inflating) Universe:

In 1980, the American physicist Alan Guth proposed a model of the universe based on the Big Bang, but incorporating a short, early period of exponential cosmic inflation in order to solve the horizon and flatness problems of the standard Big Bang model. Another variation of the inflationary universe is the cyclic model developed by Paul Steinhardt and

Neil Turok in 2002 using state-of-the-art M-theory, superstring theory and brane cosmology, which involves an inflationary universe expanding and contracting in cycles.

Multiverse:

The Russian-American physicist Andrei Linde developed the inflationary universe idea further in 1983 with his chaotic inflation theory (or eternal inflation), which sees our universe as just one of many “bubbles” that grew as part of a multiverse owing to a vacuum that had not decayed to its ground state. The American physicists Hugh Everett III and Bryce DeWitt had initially developed and popularized their “many worlds” formulation of the multiverse in the 1960s and 1970s. Alternative versions have also been developed where our observable universe is just one tiny organized part of an infinitely big cosmos which is largely in a state of chaos, or where our organized universe is just one temporary episode in an infinite sequence of largely chaotic and unorganized arrangements.

However, the big mystery is still unknown. The questions remain unanswered. Scientists keep researching, Philosophers thinking and believers is going on believing. Optimistic views rely on the light of hope that someday human species would be able to enter the enlightenment bubble and solve all the mysteries determining our fate in this vast cosmic journey in to the universe.

Ergonomics for museum design-

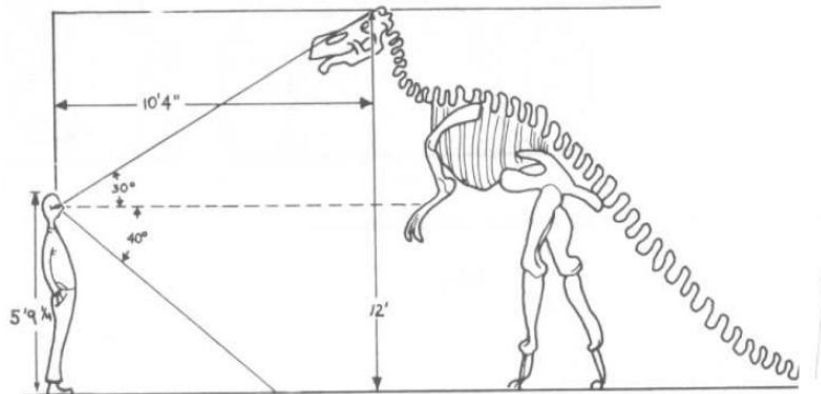


Fig. 6 Viewing distance should increase with greater size of object.

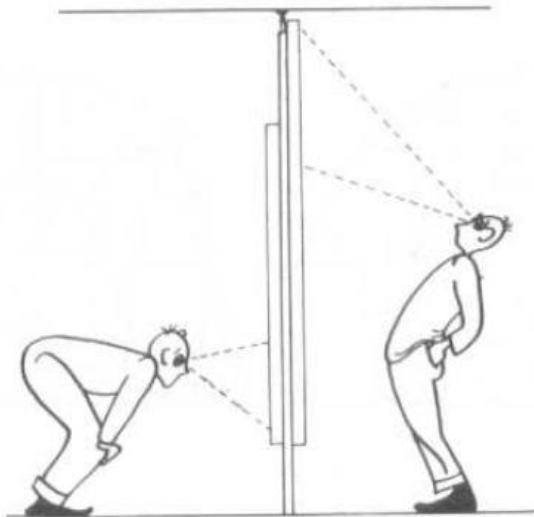


Fig. 5 Difficulties encountered in viewing details more than 3 ft below or 1 ft above one's eye level.

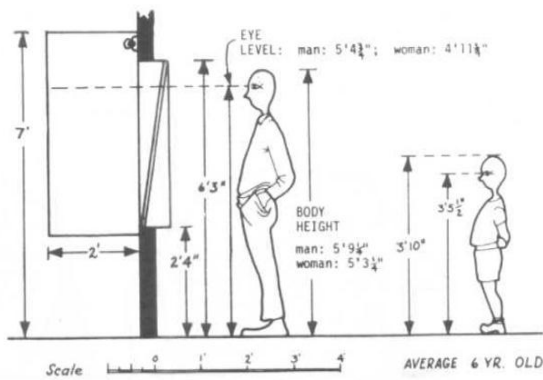


Fig. 4 Measurements of adult and six-year-old visitors in relation to cases.

CHAPTER 04

CASE STUDY

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CHAPTER 04

CASE STUDY

4.1 Lithuanian Museum of Ethnocosmology

The Lithuanian Museum of Ethnocosmology (Lithuanian: Lietuvos etnokosmologijos muziejus) is sky observatory and ethnocosmology museum in Kulionys village located about 70 kilometres (43 mi) north of Vilnius, Lithuania. It is the first such of museum in the world.^[3] It was established in 1990 next to the Molėtai Astronomical Observatory.



4-1 Lithuanian Museum

About museum

The museum is the first and the only museum of such character in the world. The essence of the museum is the relationship of a man and mankind with the Cosmic World.

Ethno cosmology is a reflection of the relations of a man and mankind with the Cosmic World and their manifestation in culture: traditions of life of the nation, its rites, material and verbal heritage, science, technology, literature, art, philosophy, religions, futurology and science fiction.

The main task of museum is to collect, accumulate, systematize, preserve, research the information on the relationship of a man and mankind with the Cosmic World and to provide it to the visitors



4-2 Museum



4-3 Interior

Programs

Day-time program "Ethno cosmology in Lithuania and abroad"

Night-time program using a 40 cm (mirror diameter) telescope

Night-time program using a 80 cm (mirror diameter) telescope

Consolation (substitute) program (this programme is organized in the evening if cloudiness hinders the night-time excursion)

Observation of surroundings

Observation of the Sun

History of the Museum

In the 1960s, the search for a location to build a new Lithuanian astronomical observatory began. The old one, situated in Vilnius' Čiurlionis St., could no longer function properly due to the city's dust, smoke, and lighting.

In 1978, we celebrated the 125th anniversary of the old astronomical observatory at Vilnius University. Thanks to Klimka, on this special occasion we opened a museum on one of the floors of the Molėtai Astronomical Observatory. Besides the telescopes from the old Vilnius observatory, one could find there several ethnographic exhibits that already marked our nation's connection with the celestial world.

On 15 March 1990, in accordance with the decision of the Presidium of the Lithuanian Academy of Sciences, the Museum of Ethnocosmology was established as a separate division of the Eksma experimental laboratory.

During 2007–2008 the museum was restored.

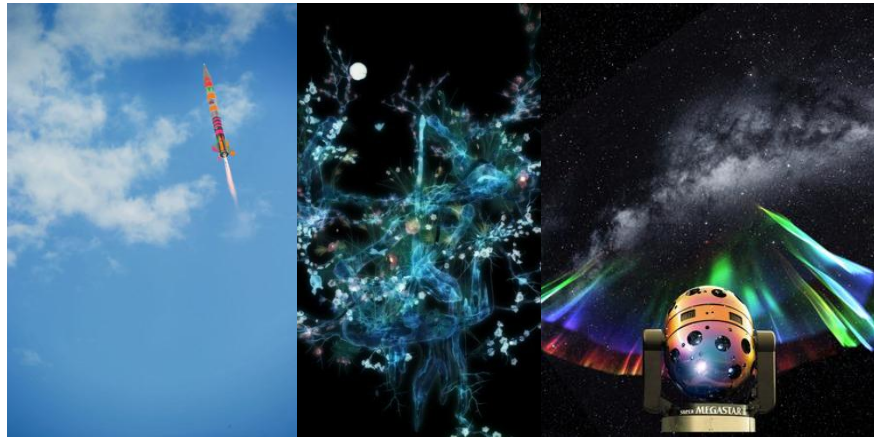
As there is no other cosmology museum to be found, some case studies cosmology exhibitions of different museum are presented below-

4.2 Museum of Contemporary Art Tokyo (MOT)

Mission [SPACE×ART] —beyond Cosmologies

The first decade of the twenty-first century has already passed and today we find 'space' drawing attention increasingly. Both outer space, into which research and development progresses, and artists' expressions of inner space are rapidly expanding/converging to constitute a parallel world. Coinciding with the 2014 space boom, we will look at the field of outer space that has drawn infinitely closer to our daily lives and also the inner space created by artists as a multiverse, surpassing individual cosmologies. In Japan, artistic experiments in this field began immediately after the Second World War and contemporary works (particle or cosmic ray works, artificial satellite art, etc.) continue

to develop. For approximately ten years JAXA's 'pilot missions in humanities and social sciences'* have carried out numerous ambitious, pioneering activities globally. Furthermore, in recent years have seen the return of the asteroid explorer, 'Hayabusa', to Earth and the launch of 'Hayabusa II', while large-scale expositions and exhibition facilities have opened and pre-events for the Tanegashima Space Art Festival have taken place, demonstrating the extent of the social boom in the space-related field. This exhibition will present art installations; items connected with space exploration, such as parts of satellites and rockets (fairings); material connected with entertainment, such as literature, manga and anime; interactive exhibits; discussions and other events to explore the new possibilities that 'reflect the expanding/converging world'. It will offer the opportunity to experience and consider 'space', not only as some different world or Utopia, but also as something that is 'ordinary' in a true sense.



4-4 NATSUNO ROCKET DAN, *Lift offed Rocket of NATSUNO ROCKET DAN "Strawberry"* (Launch Date 28th July 2012) [Reference Image], Takayuki Ohira, *SUPERMEGASTAR-II & Aurora*, 2008 [Reference Image], teamLab, *Cold Life*, 2014, Calligraphy: Sisyu [Reference Image]

Highlights of the Exhibition

- Introducing the Diverse Works/Materials Presented in 'Space × Art'
This exhibition will include various interactive exhibits, allowing it to appeal to a wide range of age groups. It will consist of approximately 50 works/materials on two floors, presenting diverse outlooks on space and art; science and artistic expression; art and entertainment; etc. It will include large-scale installations and videos etc., to explore the unparalleled

fascination of 'space' that continues to inspire and influence creativity in many fields, in the present tense

- Real Space and Imaginary Space

The space development project that JAXA inherited from its predecessors, NASDA, ISAS and NAL, has embarked on the age of manned space exploration with the Kibo module of the International Space Station (Koichi Wakata becoming captain of the Space Station on March 9, 2014). With international missions planned to explore the Moon and Mars, Earth's history is gradually expanding to become 'space history'. This exhibition uses 'a non-terrestrial viewpoint' as its keyword, presenting a bird's-eye view/sense of values that is common to both real space and the imaginary space created by artists.

- Depicting the World

The Japanese word for 'space' is 'uchu', 'u' referring to spatial and 'chu' temporal directions. Today, CERN (European Organization for Nuclear Research) has succeeded in proving the existence of the Higgs boson particle, but we still lack a comprehensive explanation of the 'dark energy', which is said to permeate all of space, or gravity. This exhibition will present a scientific approach to explaining the universe through particles, as well as the artistic approach, which tries to depict the world through dots/particles, the two strangely coinciding.

- Interactive Exhibits and Associated Projects

This exhibition will employ from the series of the super planetarium, 'Megastar' a stadium of stars; 'Space Dance in the Tube', which allows people to move their bodies and achieve an image of zero gravity; and a high-definition video showing Earth as viewed from space, presenting total immersion video and photography to create interactive displays. In addition, talks and workshops are scheduled to be held during the course of the exhibition (star observation/satellites/space debris=environmental problems in space/space architecture/space suit design/space travel/summer-holiday drawing classes/public readings on the subject of space/Tanegashima Space Art pre-events, etc.).

- To Think About Future 'SPACExART'

Space art: 1) Uses the concept of time and space within the universe to create a new worldview or aesthetics. 2) Uses a fusion of art, science and technology to forever question the state of 'space, Earth and life'. 3) The concept of space and the wide range of art regarding space activities that enables us to achieve the above (according to the definition of the research community named 'beyond' [space+art+design]). Astronomer, Roger F.

Malina, talks of 'Contemporary art which relies on space activity for its implementation' and suggests seven categories to define it. We hope that you will attend this exhibition in order to witness the inception of a new field of art.

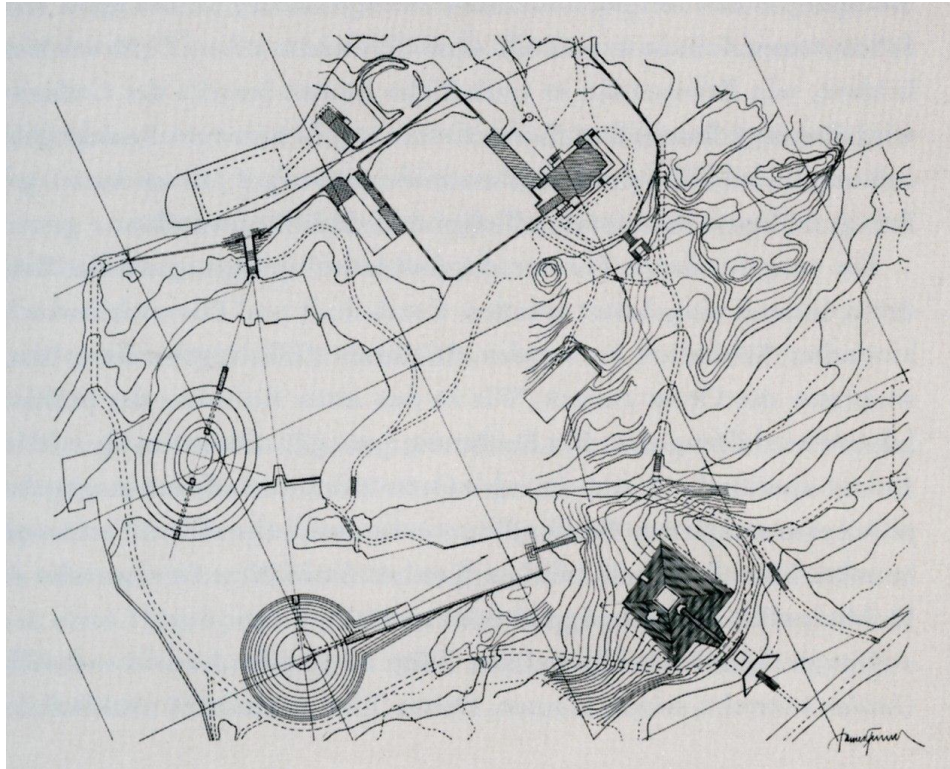
4.3 Roden Crater

Roden Crater is studied as case study of experiential spaces. Roden Crater is an extinct volcanic cinder cone, situated at an elevation of approximately 5,400 feet in the San Francisco Volcanic Field near Arizona's Painted Desert and the Grand Canyon. The roughly 400,000 year old, 600 foot tall red and black cinder cone is being turned into a monumental work of art and naked eye observatory by the artist James Turrell. Working with visual phenomena that have interested man since the dawn of civilization, the Roden Crater project will bring the light of the heavens down to earth, linking visitors with the celestial movements of planets, stars and distant galaxies. In addition to exploring the interplay of light and space in his art, Turrell has looked closely at the design of ancient observatories as places for visual perception:

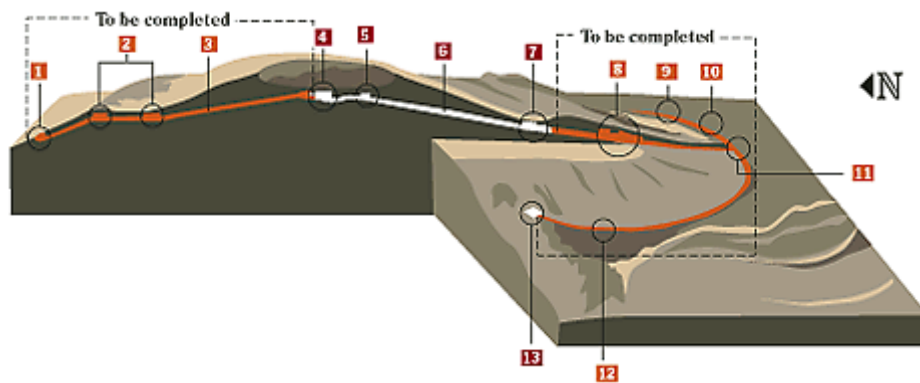


4-5 Site of Roden Crater

The artist James Turrell, for his land art project, acquired the 400,000-year-old, 3-mile-wide (4.8 km) crater's land. Turrell has since been transforming the inner cone of the crater into a massive naked-eye observatory, designed specifically for the viewing and experiencing sky-light, solar, and celestial phenomena. The fleeting Winter and Summer solstice events will be highlighted.



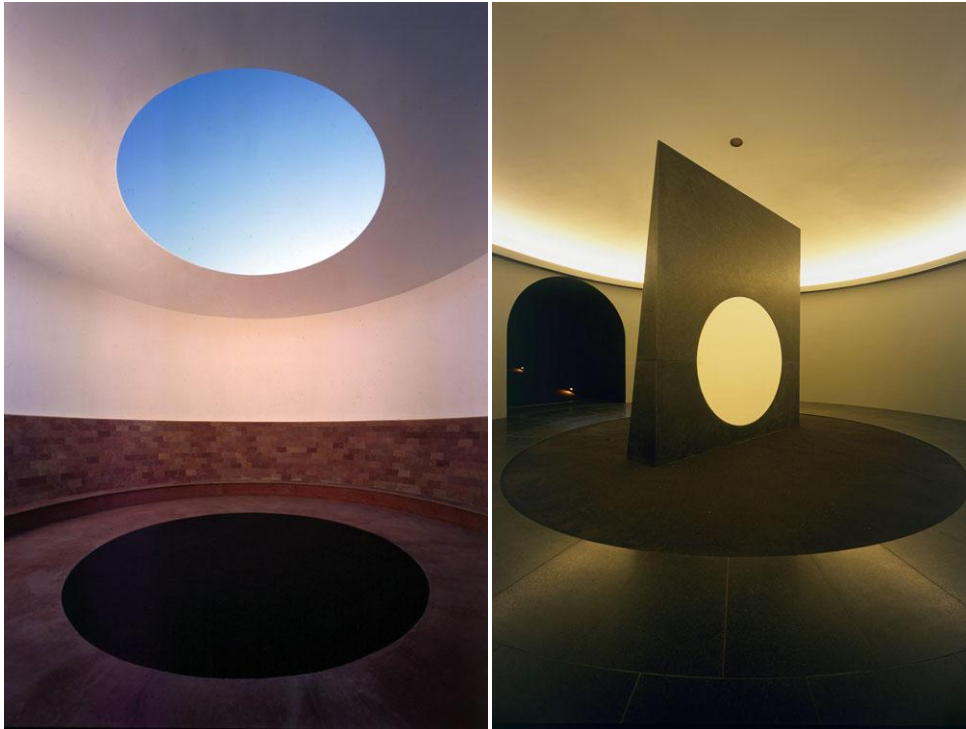
4-6 Plan of Roden Crater Project



4-7 Diagram of Construction



4-8 Interior Views



4-9 Experiential Spaces

His vision for the project has changed somewhat over the years, as spaces were added or altered based on experience he gained in working with light, but remains consistent with the original plan for the site. When complete, the project will contain 20 spaces (some with more than one viewing space). The light within the spaces will come from many sources, and some effects will be familiar to those who have seen the artist's installations and Skyspaces over the years. The relative remoteness of Roden Crater will require a journey and a commitment of time on the part of visitors, deepening the experience of discovery.

"My work is more about your seeing than it is about my seeing, although it is a product of my seeing. I'm also interested in the sense of presence of space; that is space where you feel a presence, almost an entity — that physical feeling and power that space can give.

Roden Crater has knowledge in it and it does something with that knowledge. Environmental events occur; a space lights up. Something happens in there, for a moment, or for a time. It is an eye, something that is itself perceiving. It is a piece that does not end. It is changed by the action of the sun, the moon, the cloud cover, by the day and the season that you're there, it has visions, qualities and a universe of possibilities."

- James Turrell, Architect of Roden Crater.

CHAPTER 5

PROGRAM DEVELOPMENT

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CHAPTER 5

PROGRAM DEVELOPMENT

5.1 Rational of the program

The program has been selected to make the museum more experiential which is why most space has been fixed for galleries. Public Facilities like Multi-purpose, Cafeteria, Learning Centre has also been provided.

5.2 Program derivation

As the site is in a natural setting it would be tried to design the complex as nature friendly as possible,It is very important to involve the locals in this pursuit. Therefore in addition to segregated workshops there will be exhibition areas and interaction spaces where local people would also play a role.

Broad Program	Area (sq.ft)	
1 Permanent Gallery Space	55000	
2. Multipurpose Hall	4800	
3. Temporary Gallery Space		25000
4. Learning Centre Office	5500	
5. Cafe	5000	
6. Plaza/ Terrace	4400	
7. Contemplation Space	6000	
8. Learning Centre	19190	
9. Admin	5500	
10. Service and Facilities	6300	

Total Program Area	120290
Circulation 30%	36087
Total built area	156377

Public Area:

Lobby & Lounge	4000 sft.
Reception	200 sft.
Toilets	300 sft.
Souvenir Shop	1000 sft.
Tickets Counter	100 sft.
Food Corner	1500 sft.

Total: 7400 sft.

Exhibition:

Permanent Galleries	35000sft.
Temporary Galleries	5000 sft.
Outdoor Display	2000 sft.

Total: 42000 sft.

Learning Centre:

Lobby & Information	250 sft.
Card Catalogue	250 sft.
Reading Area	2500 sft.
Stack Area	800 sft.
Research Area	1500 sft.
Archives	3000 sft.
Outdoor Reading Area	750 sft.
Librarian	150 sft.
Assistant Librarian	100 sft.

Total: 9400 sft.

Multi-Purpose:

Lobby & Lounge	700 sft.
Projection Room	100 sft.
Seatings	1750 sft.
Stage	1200 sft.
Rehersal Room	400 sft.
Green Room	200 sft.
Store	100 sft.

Toilets	300 sft.
---------	----------

Total: 4750 sft.

Administration:

Reception	150 sft.
Waiting	200 sft.
Director's Office	250 sft.
Asst. Director's Office	200 sft.
Curator	150 sft.
Public Relations Officer	100 sft.
Chief Accountant	100 sft.
Conference Room	400 sft.
Common Office Space	600 sft.
Design Section	300 sft.
Documents Officer	100 sft.
Records Room	150 sft.

Total: 5500 sft.

Service & Maintenance:

Reception Room	200 sft.
Lobby	500 sft.
Receiver Officer	150 sft.
Workshop	1000 sft.
Complex Supervisor	300 sft.
Engineering Section	300 sft.
Control & Security	800 sft.
Maintenance Staff	350 sft.
Prayer Room	200 sft.
Kitchenette	100 sft.
Toilets	300 sft.
Generator	180 sft.
Machine Room	250 sft.
Storage	2500 sft.

Total: 6330 sft.

CHAPTER 6

DESIGN DEVELOPMENT

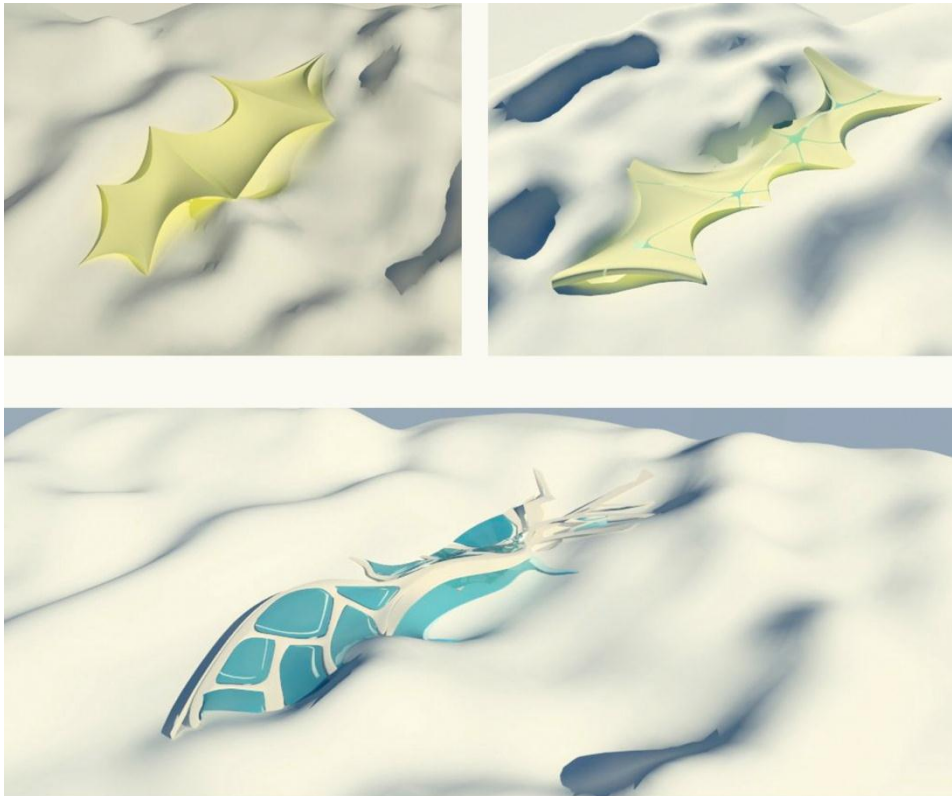
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CHAPTER 6

DESIGN DEVELOPMENT

6.1 Form Development

The form was developed merging with the landscape. The intention was to ensure human access across the roof so that people can pass by walking over the structure. As farmlands exist surrounding the site, farmers move from one place to another whole day for work. The structure should not be any obstacle in their movement which is why the structure followed the contour and took shape.



6-1 Form Development

6.2 Concept:

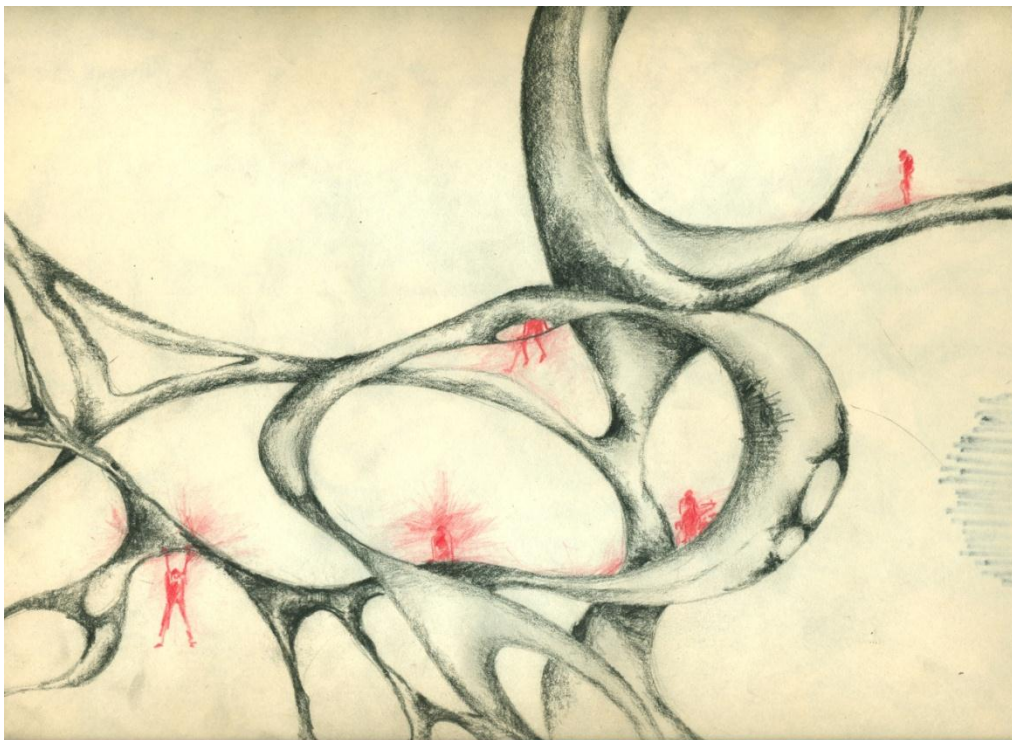
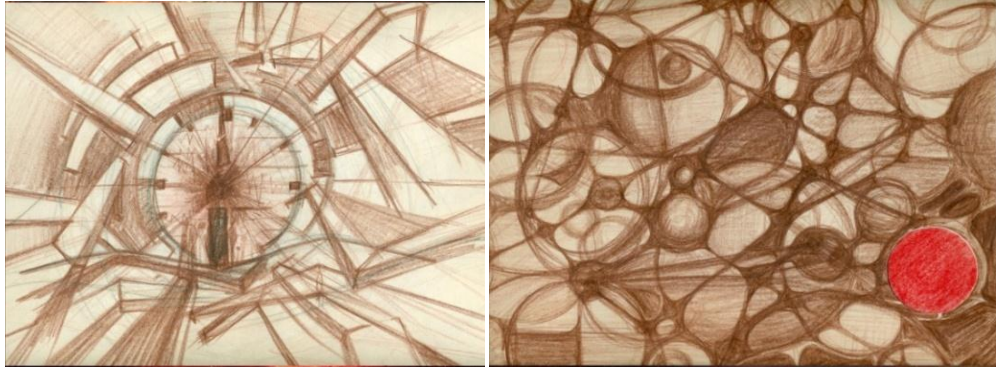
The complexity this universe holds were intended to be abstracted in the interior spaces. Everything in this universe grows slowly with time being connected with each other. With that connection we along with nature grow ourselves keeping our own identities and variation. Similarly the structure grew on site with connection to the surrounding nature. The intention was to keep the complexity as well as the connectivity in terms of form and space within the structure.



6-2 Conceptual Sketches

Thinking about cosmology often leads to confusion as we still do not know the answers we have been looking for thousands of year. One might think of many solutions but cannot be

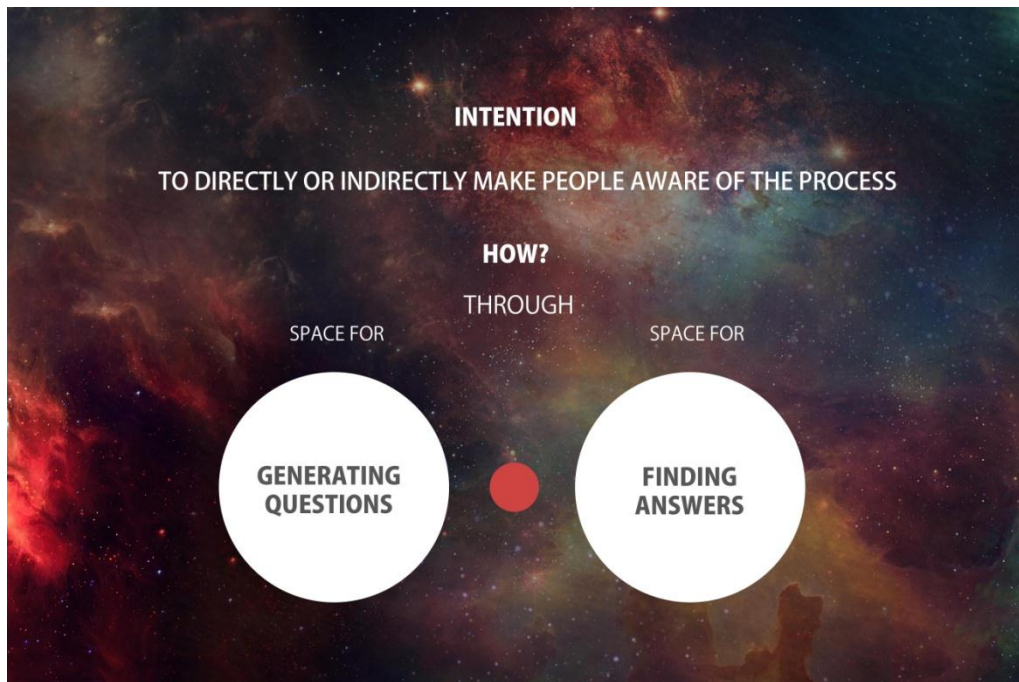
certain about any of them. This feeling of confusion was what I wanted people to feel in the interior spaces.



6-3 Conceptual Spaces

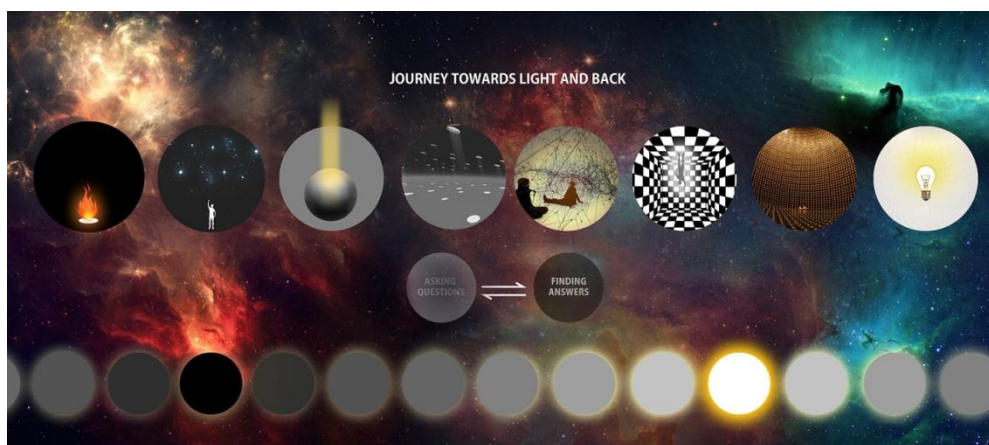
Concept of Gallery Spaces

As the main intention was to make people question, I started thinking about providing some spaces which would make people wonder and some spaces to provide the answers to the questions that arose.



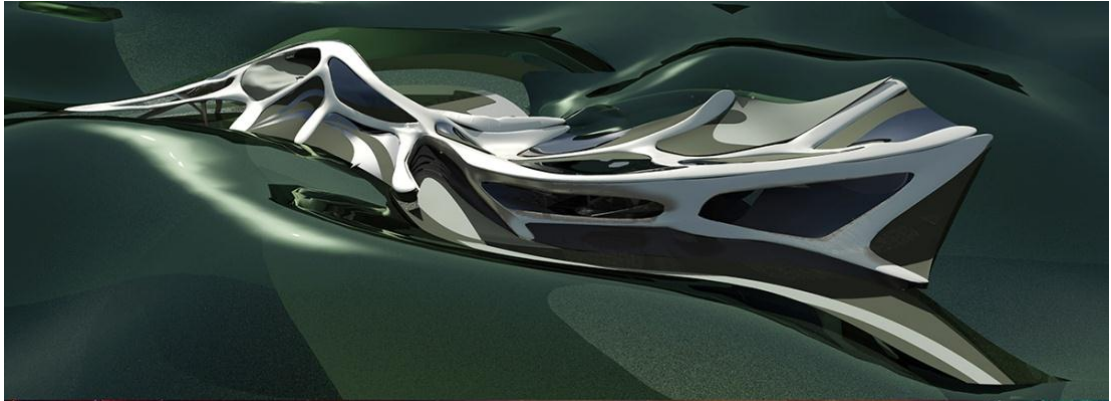
6-4 Concept Diagram

To me, the cosmological journey we are in feels like a journey going back and forth towards light and darkness. Sometimes we are lost in darkness proving our own theories wrong and sometimes we find our path back seeing a ray of light in front of us. With this concept in mind I designed the gallery spaces according to the historical phases human beings went through by bringing them from darkness to slowly exposing to broad daylight.



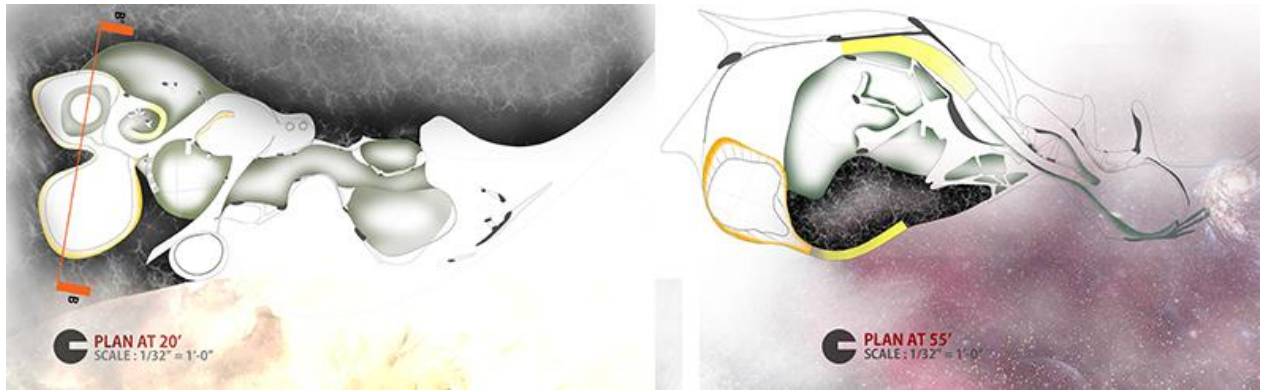
6.3 Final Design:

Perspective

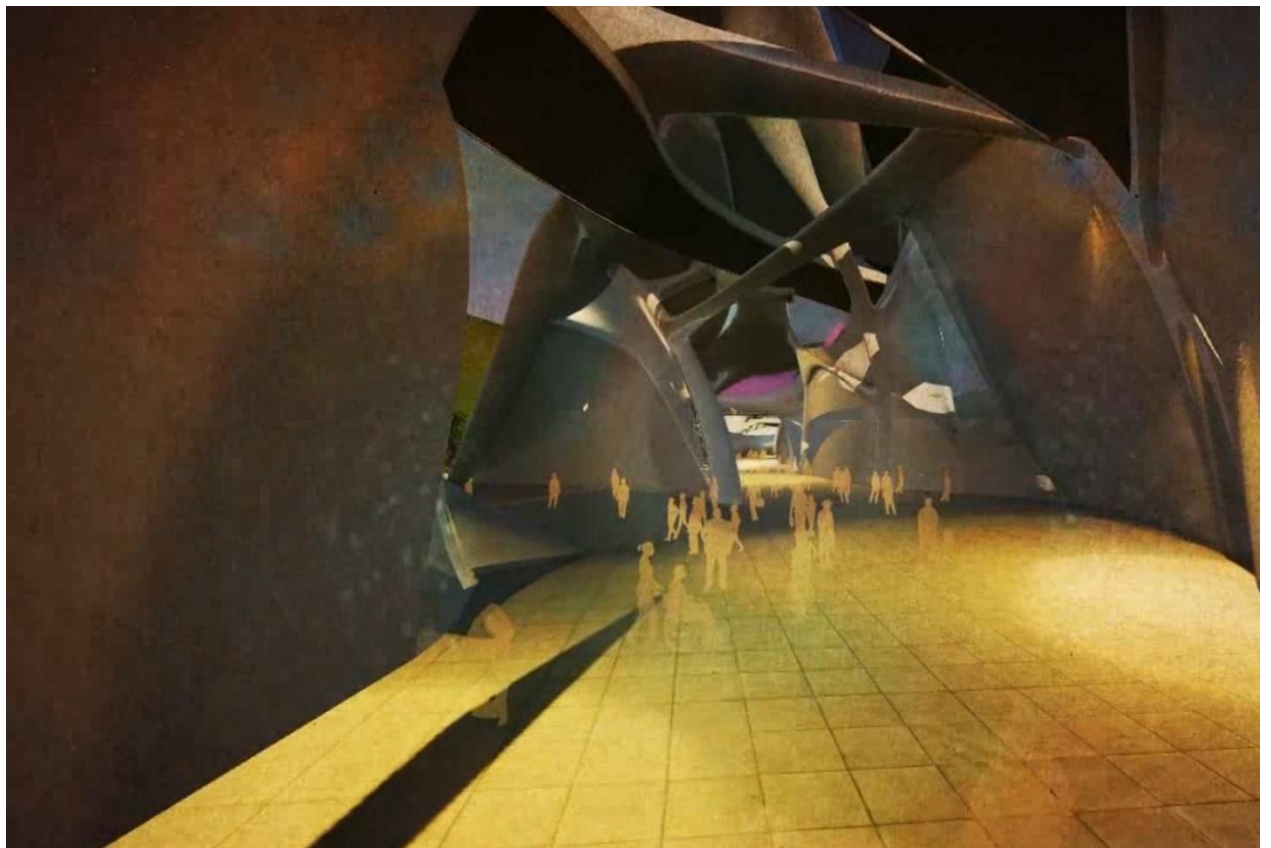




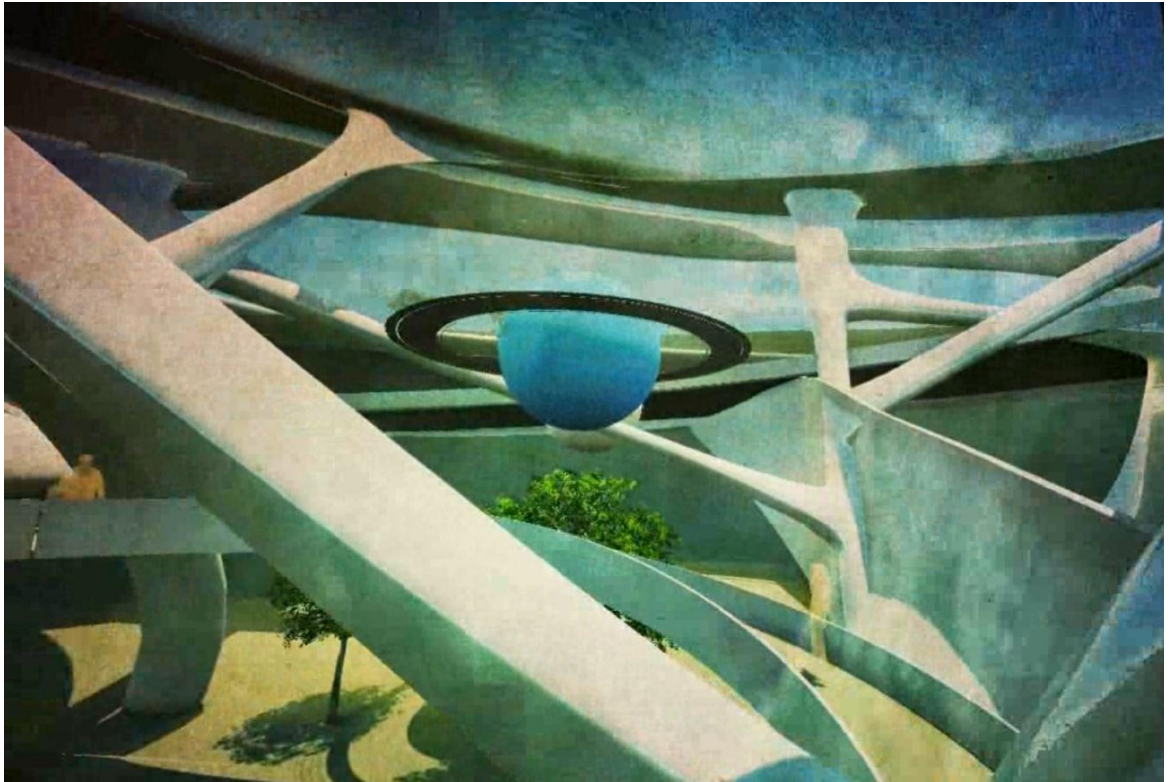
6-6 Ground Floor Plan



6-7 Floor Plans

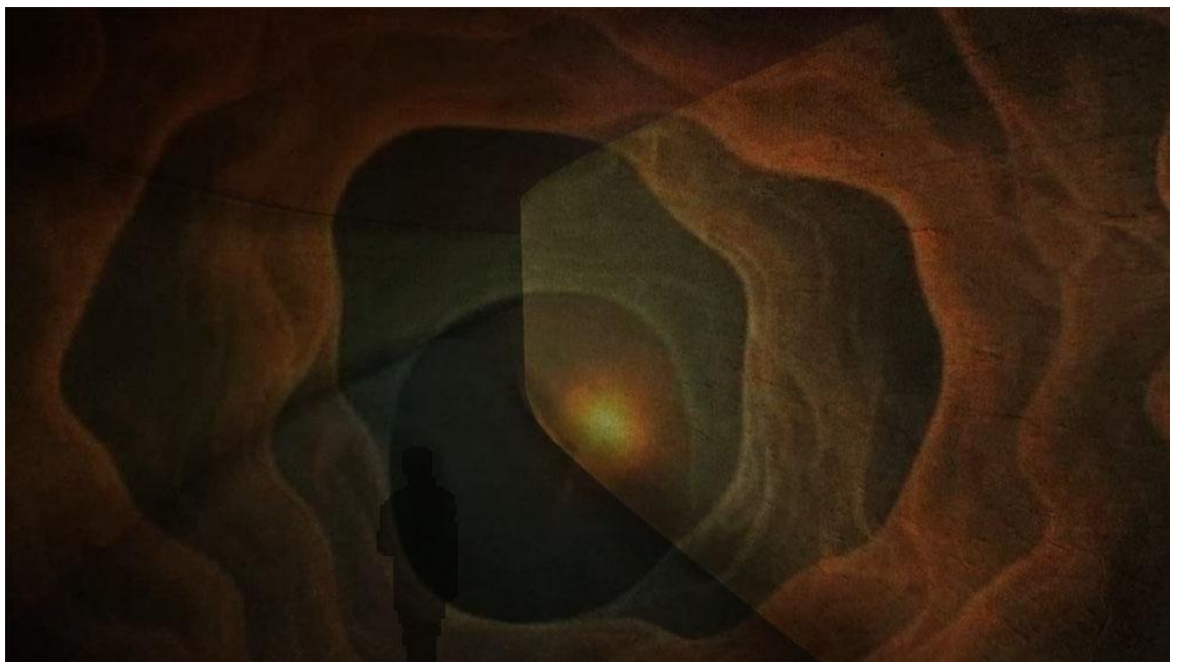


6-8 Interior Space



6-9 Interior Space

The galleries are designed with the play of natural light. From ancient times to present day five galleries are designed according to the phases of cosmological evolution from darkness to light. The journey start in a cave where people inter with a fire torch just like the ancient human beings would move around in their times.



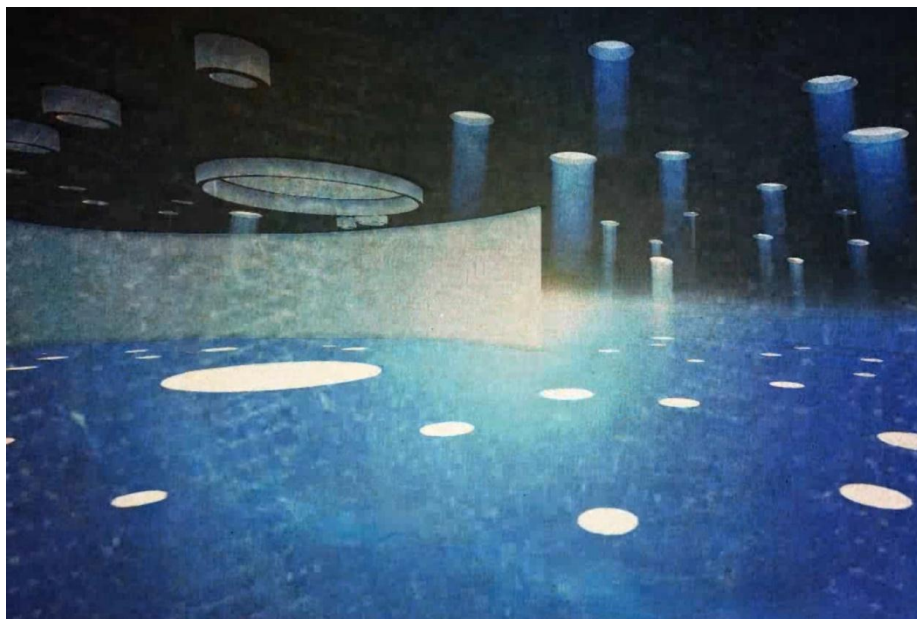
6-10 Gallery- Ancient Times

As ancient people starts worshipping nature, defying Sun and Moon their Gods, the journey through the museum also progresses from ancient times. The visitors would arrive at a space where a circular punch allows sunlight on the surface of planetarium resembling the nature worshipping phase.



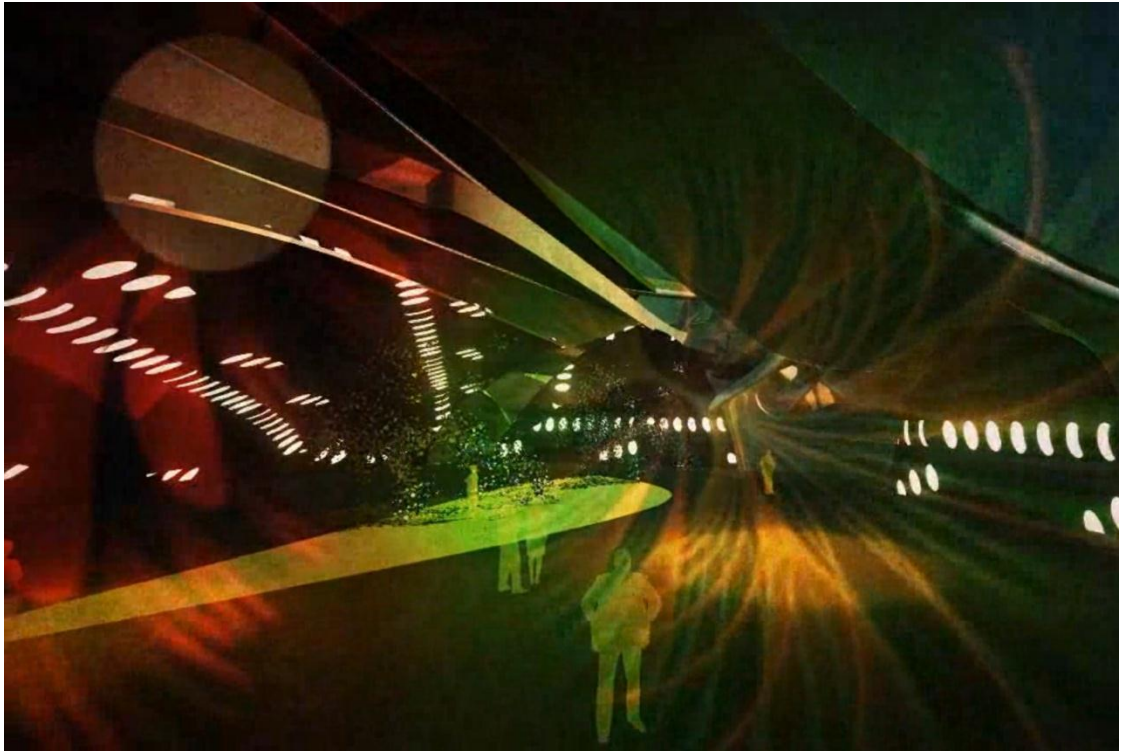
6-10 Gallery- Nature Worshipping Phase

After this the phase of religion arrives. A space is designed with several light holes to allow sunlight in the gallery signifying the different religious beliefs people followed.

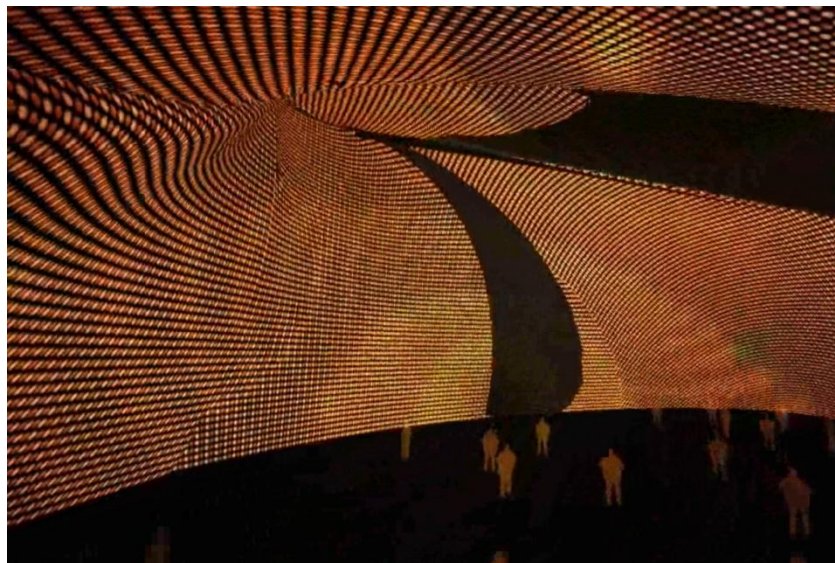


6-10 Gallery- Phase of Religion

Post religion, the time of chaos with a chaotic space designed with artificial light.

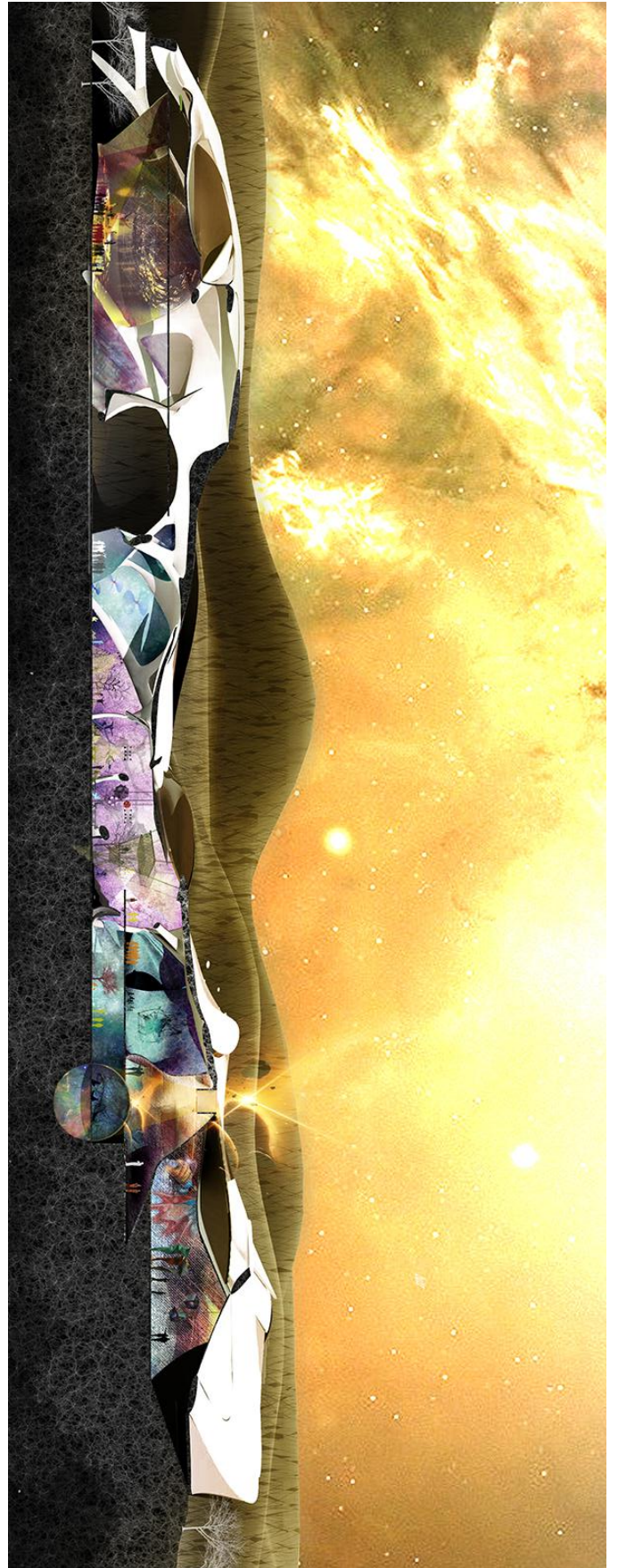


6-11 Gallery- Phase of Chaos

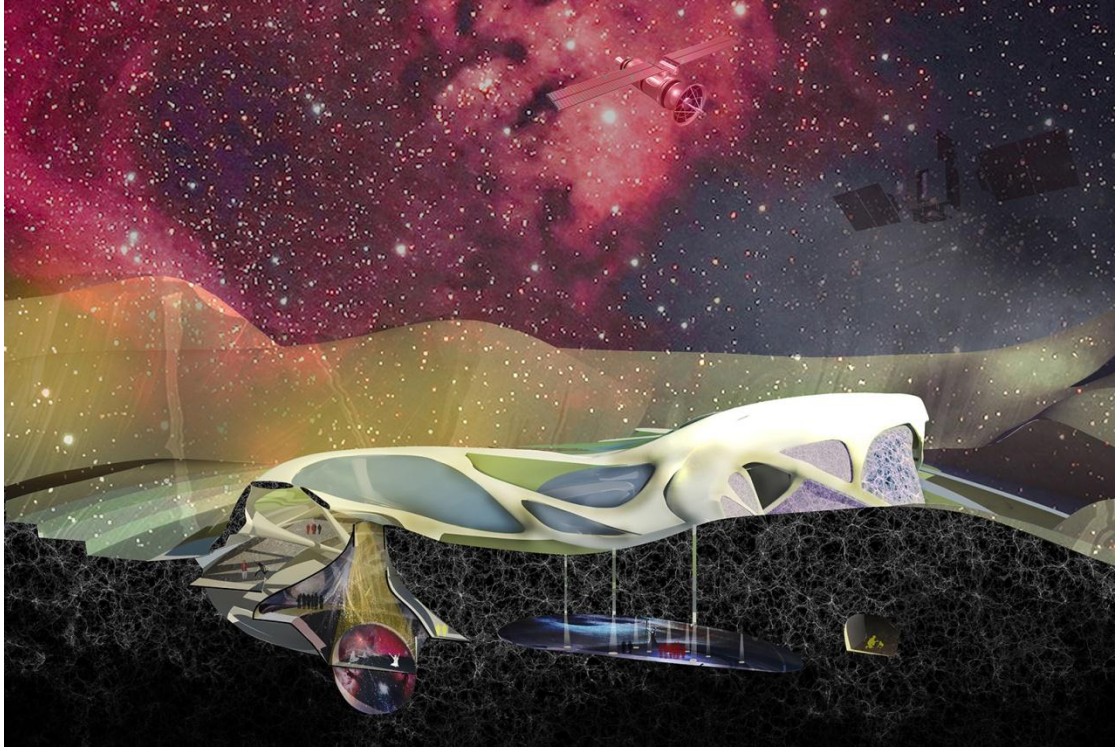


6-12 Transitional Space

A transitional space to think about the whole journey after which the informative gallery begins where people can go through all the answers to their questions.

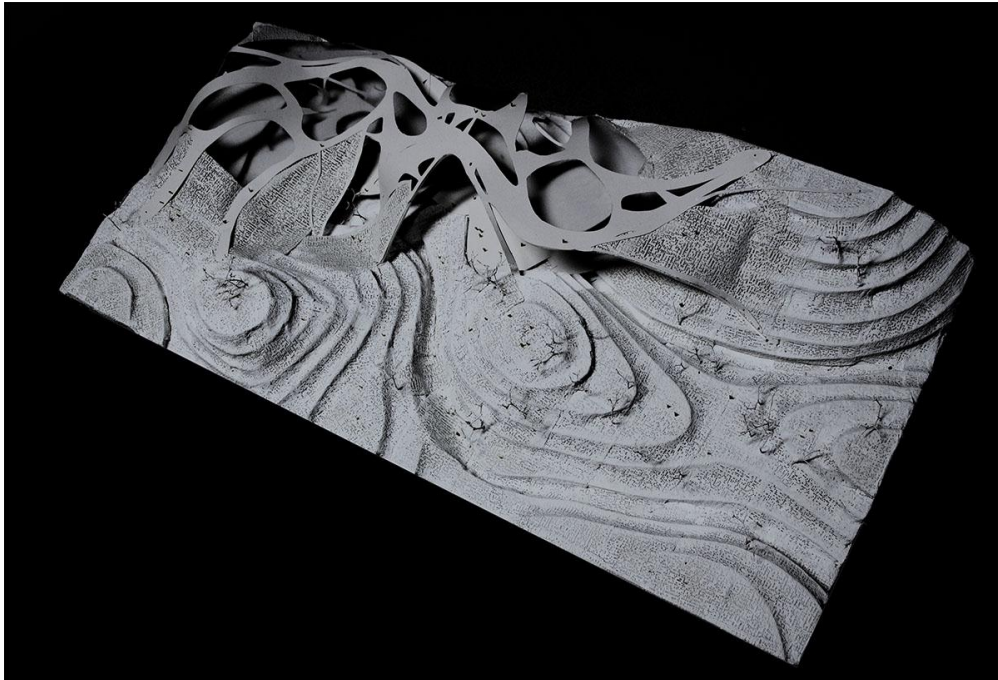


Section AA'



Section BB'

6.4 Model Images





6.5 Animation

For animation go to this link-

<https://www.youtube.com/watch?v=MhGQJBzaaow&feature=youtu.be>

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