

NATIONAL ASTRONOMICAL OBSERVATORY, M A N N A R , S R I L A N K A



NAME :DINUSHI THIVIDUNEE NARAMPANAWA
EDUCATION :GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY SRI LANKA
PROJECT :COMPREHENSIVE DESIGN PROJECT(YEAR V)

NATIONAL ASTRONOMICAL OBSERVATORY, MANNAR, SRI LANKA

PROJECT DESCRIPTION

Astronomical observatory is a specialized facility equipped with optical, radio, or space-based instruments used to observe and collect data on celestial bodies such as stars, planets, galaxies, and cosmic events. It provides controlled environmental conditions for precise astronomical measurements, supports data analysis, and often includes research laboratories, observation decks, and public outreach spaces for education and scientific discovery

CLIENT

A C C I M T – Arthur C Clarke Institute for Modern Technologies



PROJECT IMPLEMENTATION

1. INTERNATIONAL GAP

ASTRONOMICAL ADVANTAGES IN SRI LANKA

LOCATION

BETWEEN AUSTRALIA AND AFRICA LIES A MAJOR VOID WITH NO SIGNIFICANT OBSERVATORIES. A LONGITUDE GAP SRI LANKA IS GEOGRAPHICALLY POSITIONED

SRI LANKA IS LOCATED NEAR THE EQUATOR (APPROXIMATELY 7°N), ALLOWING VISIBILITY OF BOTH THE NORTHERN AND SOUTHERN CELESTIAL HEMISPHERE.

LATITUDE 7 TO LATITUDE 9 - THE POSSIBILITY OF MILKY WAY OBSERVATION IS HIGH.

LOW LIGHT POLLUTION ZONE

BETWEEN AUSTRALIA AND AFRICA LIES A MAJOR VOID WITH NO SIGNIFICANT OBSERVATORIES. A GAP SRI LANKA IS GEOGRAPHICALLY POSITIONED TO BRIDGE.

2. THE SCIENTIFIC NEED FOR ASTRONOMICAL EDUCATION

LACK OF PUBLIC ENGAGEMENT WITH ASTRONOMY AND SPACE SCIENCE IN SRI LANKA

PAST -

THE "STAR GATE" OF ANURADHAPURA EARLY BRAHMI INSCRIPTIONS REFERENCING CELESTIAL CONCEPTS: INTEGRATION OF ASTRONOMY IN ANCIENT TIMEKEEPING DEVICES ASTRONOMICAL ORIENTATION OF MEGALITHIC STRUCTURES SIGIRYA'S SOLAR ALIGNMENT

PRESENT -

INSTITUTES/ORGS: ~8-10 ACTIVE (ACCIMT, IOAS, ARIS, SLAA, + 5 UNIVERSITY CLUBS)

LARGEST TELESCOPE: 45 CM OPTICAL (ACCIMT)

UNIVERSITY SOCIETY MEMBERSHIP: GOLOBG ALONE >100 MEMBERS OLYMPIAD: SINCE 2007, TOP 5 STUDENTS SELECTED YEARLY FOR IOAA

WORKSHOPS: ~30-35 STUDENTS PER SESSION (MULTIPLE PER YEAR)

OVERALL STUDENT ENGAGEMENT: ~500-1000+ ANNUALLY (OLYMPIAD + UNI + OUTREACH)

ASTRO-TOURISM AWARENESS: ~20% OF SURVEYED TOURISTS AWARE; DEMAND POTENTIAL HIGH

ASTRO-TOURISM ACTUAL PARTICIPATION: HUNDREDS-LOW THOUSANDS ANNUALLY (NOT OFFICIALLY TRACKED)

FUTURE -

INFRASTRUCTURE AND ARCHITECTURAL DEVELOPMENTS

NATIONAL ASTRONOMICAL OBSERVATORY (NAO)

A PROPOSAL HAS BEEN MADE FOR ESTABLISHING A NATIONAL ASTRONOMICAL OBSERVATORY EQUIPPED WITH A 1.6-METER TELESCOPE. THE SELECTED SITE OFFERS OPTIMAL CONDITIONS FOR OBSERVATIONS AND AIMS TO SERVE AS A HUB FOR

3. ASTRONOMY AND TOURISM

ASTRO-TOURISM IS AN EMERGING NICHE TOURISM SECTOR IN SRI LANKA THAT ATTRACTS TRAVELERS SEEKING UNIQUE NIGHT-SKY EXPERIENCES

WHEN A NICHE TOURISM AREA IS IDENTIFIED AND CAREFULLY CATERED TO, IT STRENGTHENS THE OVERALL CONTEXT THROUGH THE 6 A'S OF TOURISM DEVELOPMENT: ATTRACTIONS, ACCESSIBILITY, ACCOMMODATION, AMENITIES, ACTIVITIES, AND ANCILLARY SERVICES ENSURING A WELL-SUPPORTED, SUSTAINABLE, AND MEANINGFUL TOURISM EXPERIENCE.

LONGITUDE MAP

FOREST COVER MAP

LIGHT POLLUTION MAP

WIPATTU NATIONAL PARK AND BUFFER FOREST ZONES

MANNAR DISTRICT ECOLOGICALLY SENSITIVE AREA MAP

LATITUDE MAP PERIYAMARIPPU FOREST RESERVE

BUILDING IMPLEMENTATION

1. ENVIRONMENTAL

SITE SELECTION CRITERIA

ENVIRONMENTAL FACTORS: STABLE CLIMATE (TEMPERATURE, HUMIDITY, WIND SPEED, STABILITY OF ATMOSPHERE & WEATHER) AIR QUALITY (PM2.5, PM10, OZONE, NOXIDES) (STABLE GROUND, AVOID LANDSLIDE OR FLOOD ZONES) DISTANCE FROM ACTIVE FAULT LINES (STRUCTURAL SAFETY)

EXISTING INFRASTRUCTURE: PROXIMITY TO ROADS, RAILWAYS, AIRPORTS, AND UTILITIES (WATER SUPPLY AND SEWERAGE) DISTANCE FROM NOISE SOURCES (INDUSTRIAL, COMMERCIAL, RESIDENTIAL) DISTANCE FROM ROAD DEBRIS (DEBRIS, VIBRATIONS) DISTANCE FROM ROAD DEBRIS (DEBRIS, VIBRATIONS) DISTANCE FROM ROAD DEBRIS (DEBRIS, VIBRATIONS)

ENVIRONMENTAL STATISTICS

- ECOSYSTEM SENSITIVITY
- CANOPY LEVEL IMPACT
- GROUND DISTURBANCE
- WILDLIFE MOVEMENT
- NOISE POLLUTION
- LIGHT POLLUTION
- TOURISM STRATEGY
- VEHICLE FLOW MANAGEMENT
- ENERGY STRATEGY
- WASTE MANAGEMENT

2. CONTEXTUAL

MACRO CONTEXT

THE SELECTED LOCATION IS MADHU AREA IN MANNAR DISTRICT. THE POPULATION IS SMALL RELATIVE TO MAJOR PROVINCES - 100-120K WITH PRIMARY LIVELIHOODS IN FISHING, AGRICULTURE, AND SMALL-SCALE SERVICES. THIS SHAPES LOCAL LABOUR AVAILABILITY AND SOCIO-ECONOMIC CONDITIONS FOR COMMUNITY ENGAGEMENT.

MICRO CONTEXT

THE PERIYANCHIKULAM / PERIYANCHULAM

LOCALITY SITS WITHIN THE PARK'S WIDER INFLUENCE/BUFFER AREA NEAR MANNAR. THE WIPATTU REGION IS NEAR THE ANCIENT CULTURAL TRIANGLE (ANURADHAPURA AREA) AND CONTAINS ARCHAEOLOGICAL TRACES AND LONG HISTORICAL SIGNIFICANCE DOCUMENTED IN SRI LANKAN CHRONICLES.

THE SELECTED SITE IS LOCATED 30KM DISTANT TO THE URBAN AREAS - ANURADHAPURA TOWN AND MANNAR TOWN

3. ASTRONOMICAL OBSERVATORY SPECIFICATIONS

OPTICAL OBSERVATORY

TELESCOPE 01 - 0-45CM CASSEGRAIN TELESCOPE

TELESCOPE 02 - 5-40 CM RITCHEY-CHRÉTIEN TELESCOPE

DISTANT BETWEEN TWO OBSERVATORIES OR VISUAL OBSTRUCTS SUCH AS BUILDINGS. - 50M MINIMUM DISTANCE

THE OBSERVATION DECK SHOULD BE HUMIDITY CONTROLLED FROM AN OUTER AREA

MASTER PLAN PROPOSAL

OPERATIONAL ZONES

ECO ZONE

NATIONAL ASTRONOMICAL OBSERVATORY

OPERATIONAL STAFF AREA

STUDENT AND STAFF ACCOMMODATION

ECO TOURISM POOL

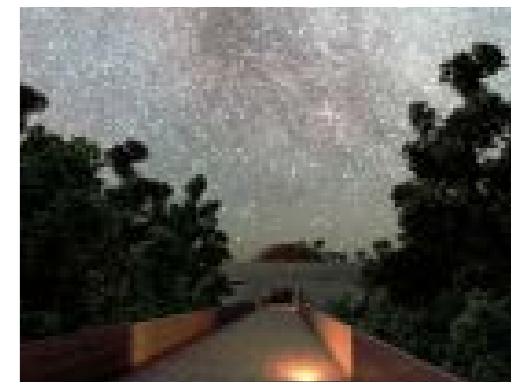
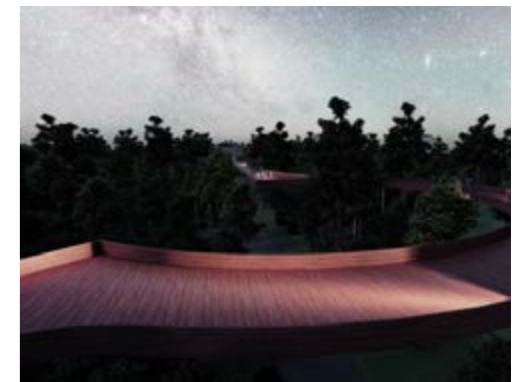
STRONG BAKWATI ECOLOGICAL BRIDGE

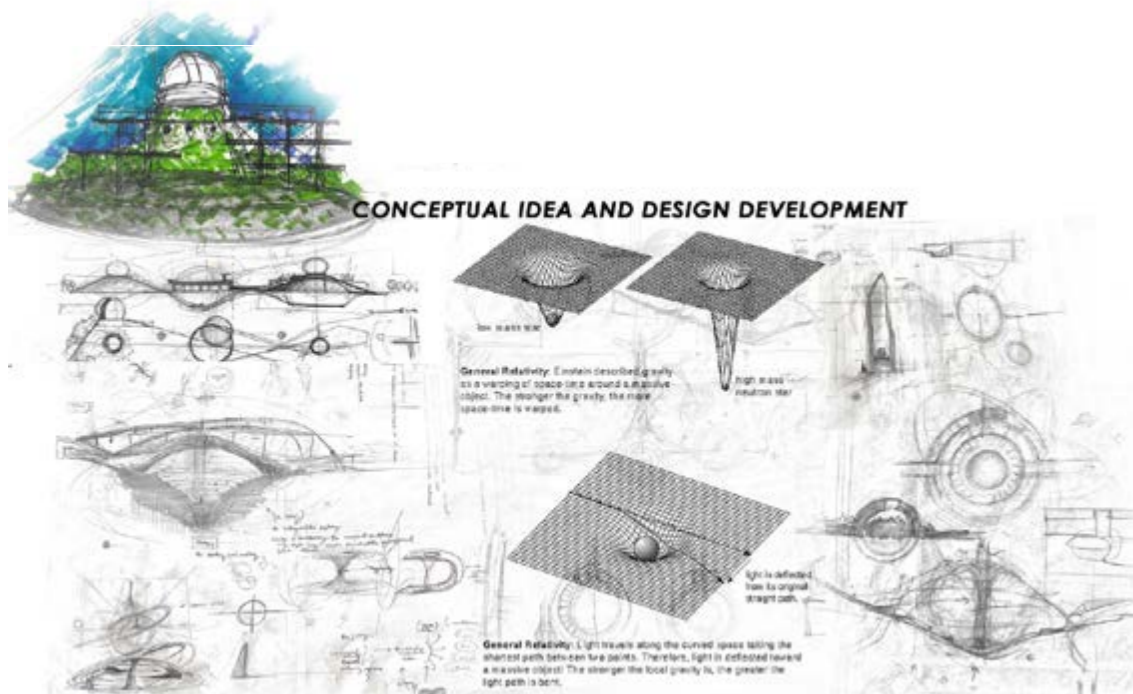
INTERNATIONAL OPTICAL OBSERVATORY

RESEARCHER VILLA/ RESEARCHERS ROOM

ASTRONOMICAL OBSERVATORY AND COSMIC EXPERIENCE CENTER

ALCANTARA OBSERVATION DECK





GRAVITY AND SPACE-TIME,

The transformation of 4-dimensional cosmic behavior into a 3-dimensional architectural experience. The entire building is organized around a central mass: the planetarium. This spherical core acts like the "mass" in Einstein's space-time diagram, generating the conceptual gravitational pull around which all other functions bend and orbit.

Surrounding this core, three hollow space-frame circulation tubes form the primary movement system. These tubes operate like portals, guiding visitors through different layers of the cosmic narrative. They also accommodate the telescope domes and act as structured channels for both daytime and nighttime programs.

As the central mass, the planetarium defines how space bends. The circulation paths curve, compress, and expand in response, allowing visitors to feel the relationship between mass, space, and gravity through movement itself.

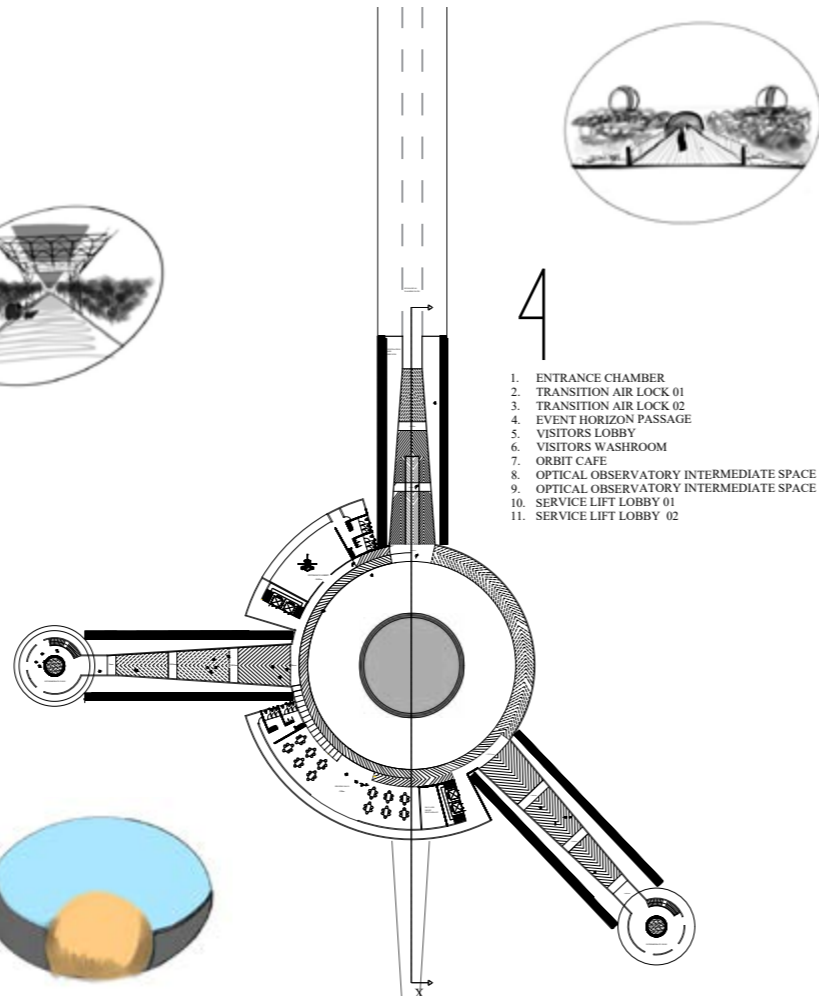
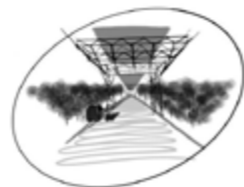
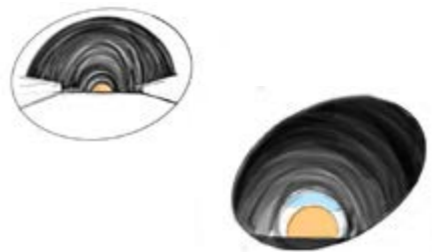
DUAL PROGRAMMING

DAYTIME FUNCTIONS

include lecture halls, research laboratories, data-collection centers, and a planetarium operating as a live projection room for scientific visualization. The experience is focused on mass and gravity — solid, grounded, and knowledge-driven. Lower levels move in a conceptual "orbital" motion opposite to the nighttime flow, representing the energy required to escape a gravitational field.

NIGHTTIME FUNCTIONS

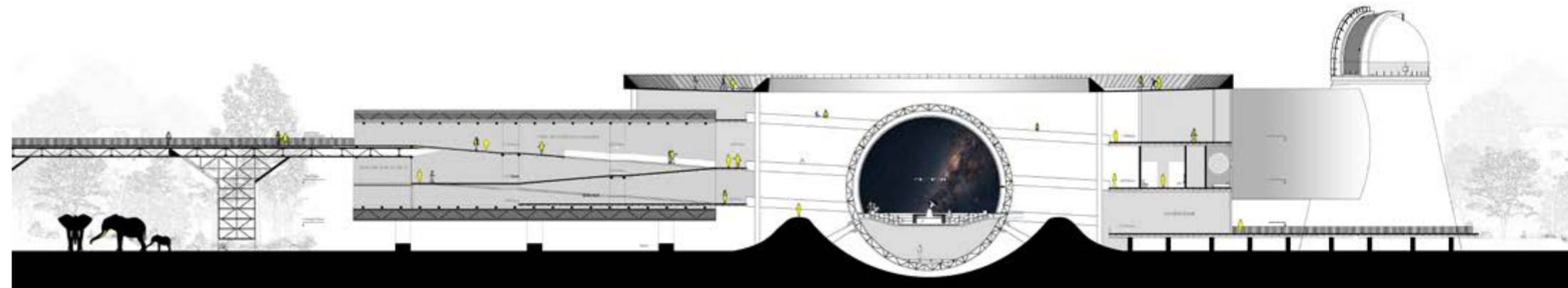
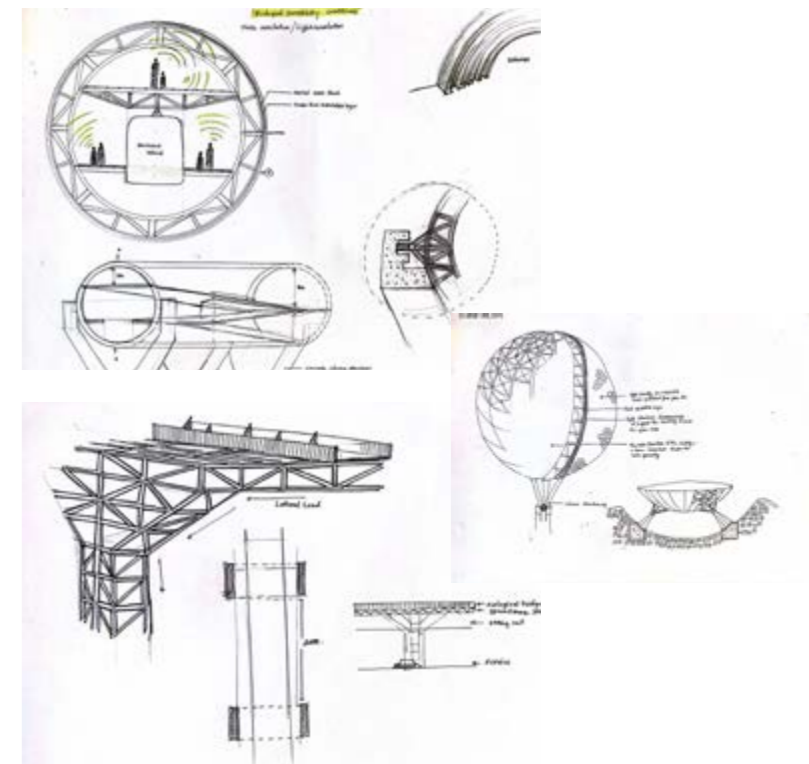
Transform the upper levels into observatory platforms and telescope stations. Visitors move through the space like bodies in orbit, guided toward celestial viewing points. The experience shifts to light and gravity, echoing the cosmic dance between illumination and curvature of space.



2ND FLOOR



CONSTRUCTION DETAILS.



SECTION X-X