PROJECT

IRIS

ORBITAL ELEVATOR
& SPACE TELESCOPE

WE WILL PUT OUR EYE ON SKIES

In Greek mythology, Iris (/ˈaɪrɪs/; Greek: Ἶρις Ancient Greek: [îːris]) is the personification of the messenger of the gods. She is also known as one of the goddesses of the sea and the sky. Iris was said to have golden wings to travel on the rainbow while carrying messages from the gods to mortals. Iris links the gods to humanity. She travels with the speed of wind from one end of the world to the other and into the depths of the sea and the underworld.

The three design methodologies Biomimicry, Biomorphism, Biophila were used in the project.
Inspired by the IRIS of the eye in its mechanism and function as well. IRIS will serve as a telescope to explore deep space and as an orbital elevator to link earth with both moon and Mars

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1st Principle

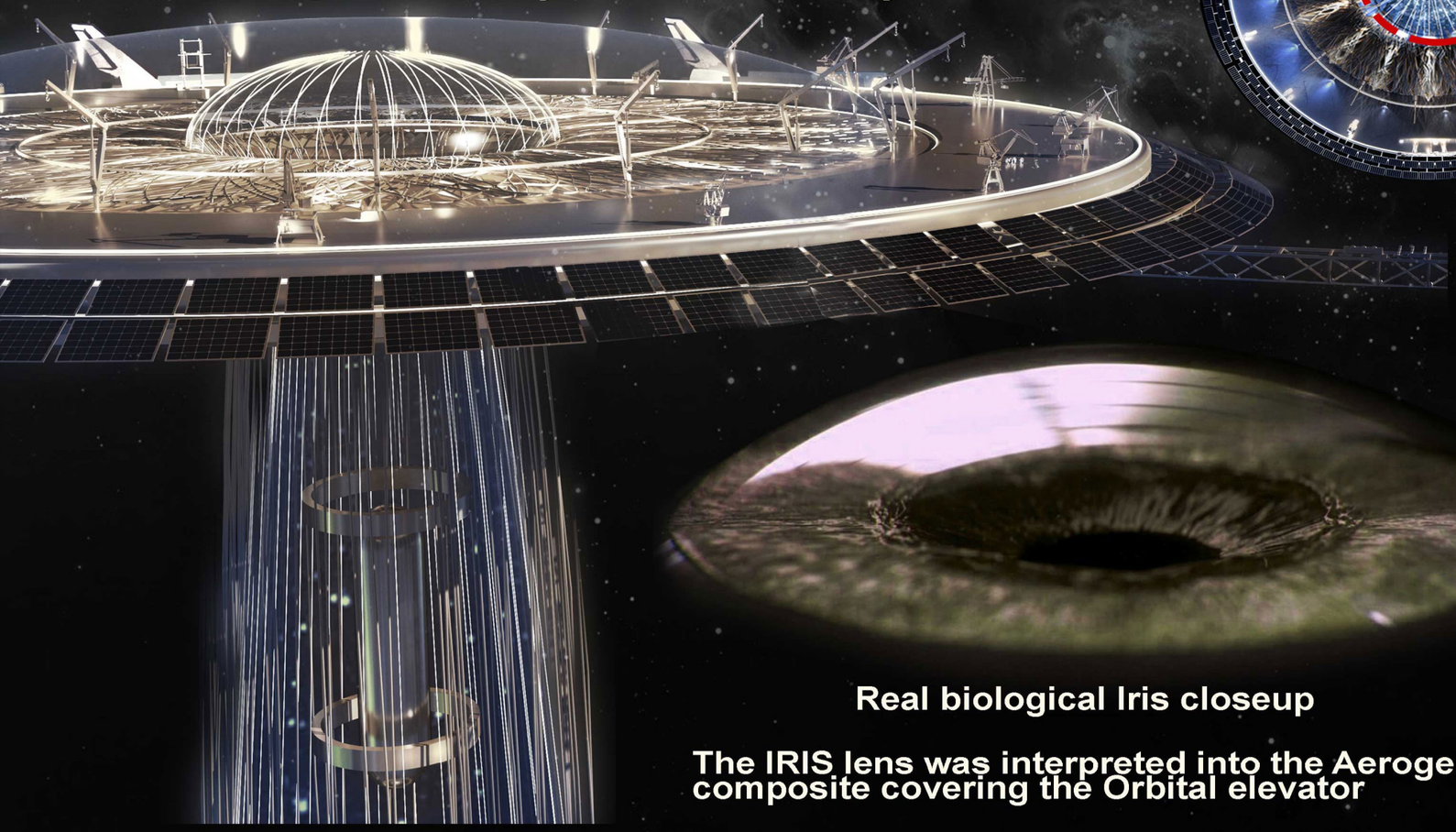
BIOMIMICRY

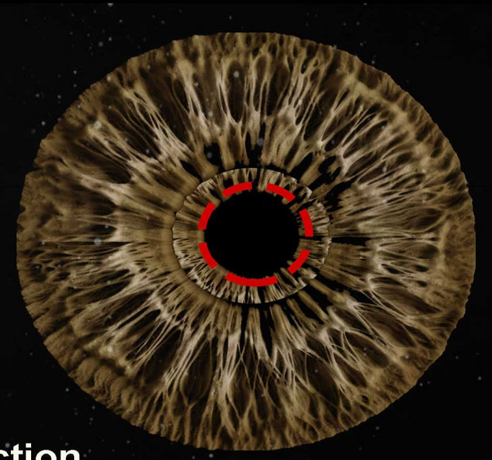
Biomimicry is essentially mimicking biology system of the Iris to solve the extreme tension forces on the tether inspired from the muscle contraction of the eye for sustainable structure. This type of practice focuses on structure, Also the eye is a good analogy to make a space telescope to explore the deep space. Nature was used to help solve complex problem of structure and create more efficient system in project Iris.

Biomimicry approach was used to solve the problem of inertial differences on the top dosk station due to its position of Lagrande point L2. The contraction or dialation will enable the Dock station to have a suspension system that will absorb any unstatic gravitational forces applied on the station to protect it from being separated from the tether.

Real biological Iris image was the source of inspiration to make the slogan of the project:

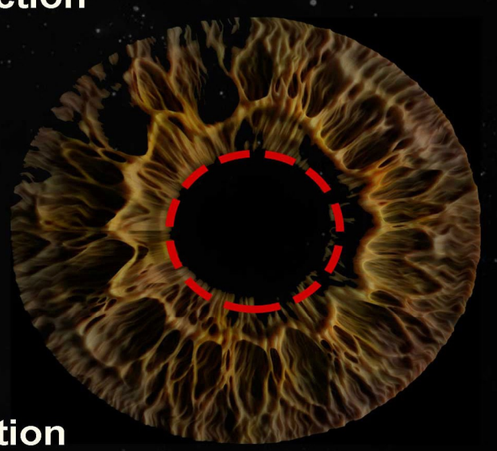
«We will put an eye on the sky»





A

IRIS contraction



B

IRIS dialation

Real biological Iris closeup

The IRIS lens was interpreted into the Aerogel Dome composite covering the Orbital elevator

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3rd Principle

BIOPHILA

The design approach of the livable spaces is the Biophila. The goal was to create a micro self sustaining ecosystem. The bio-regenerative closed loop village will generate Oxygen and water and food to sustain life.
Biophila, which is human's natural fondness to associate with nature, particularly that of the ecosystem features of a natural environment. Biophila is not so much a representation of nature, but rather actual nature. The practice and implementation of biophilia focuses on bringing nature to the user through large natural views, access to gardens or even scenic art pieces. The benefit of biophila is having a positive cognitive effect on people, which can increase productivity as well as recovery times.

Bio-Regenerative closed loop village

Diversification of Flora and Fauna inside the village

Artificial lighting to regulate the Circadian Rythm

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Cost-effective construction

The IRIS project will serve as an orbital elevator to link the 3 celestial bodies: Earth, Moon and Mars. A lunar space elevator or lunar spacelift is a proposed transportation system for moving a mechanical climbing vehicle up and down a ribbon-shaped tethered cable that is set between the surface of the Moon "at the bottom" and a docking port suspended tens of thousands of kilometers above in space at the top.
It will allow for a reusable, controlled means of transporting payloads of cargo, or possibly people, between a base station at the bottom of a gravity well and a docking port in outer space.
A lunar elevator could significantly reduce the costs and improve reliability of soft-landing equipment on the lunar surface. For example, it would permit the use of mass-efficient (high specific impulse), low thrust drives such as ion drives which otherwise cannot land on the Moon. Since the docking port would be connected to the cable in a microgravity environment.

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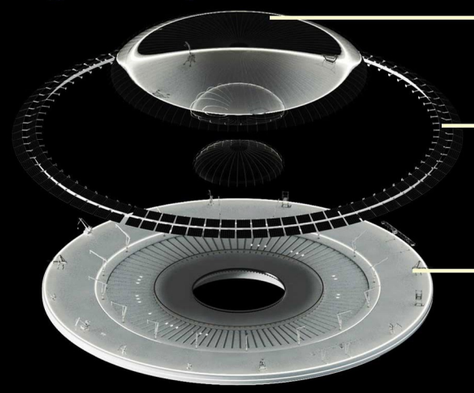
TOP DOCKING PORT

In Lagrande point L2



Aerogel covering dome to protect the top dock port from raditaions and extreme temperatures

A Double story 360 circular array of solar panels powering the top dock port

The insulating and protecting sheath surrounding and enveloping the climber and tether.

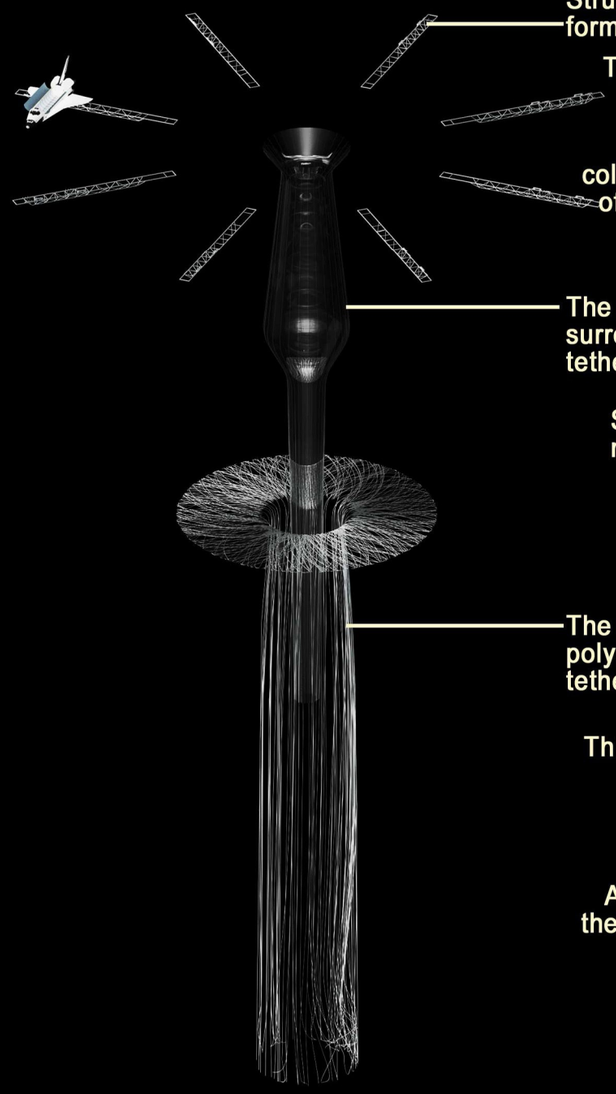
The main dock port landing and control unit spaces

Top cap sealing the ground pit crater

Structural loading dock to receive shuttles formed of mega trusses

Three main lighting sources regulating the circadian rythm inside the colony

Main structural frames that support the colony from the internal pressure composed of memory shaped alloys for durability and sustainability



The insulating and protecting sheath surrounding and enveloping the climber and tether.

Secondary structure composed of tension members of carbon nano tubes with three layers stranded together

Transparent vault composed of aerogel based nano-composties

The bunch of ultra-high-molecular-weight polyethylene fibre cords of the connecting tether

Third layer of structure composed of carbon nano tubes shaped in voronoi pattern

Surface elevators

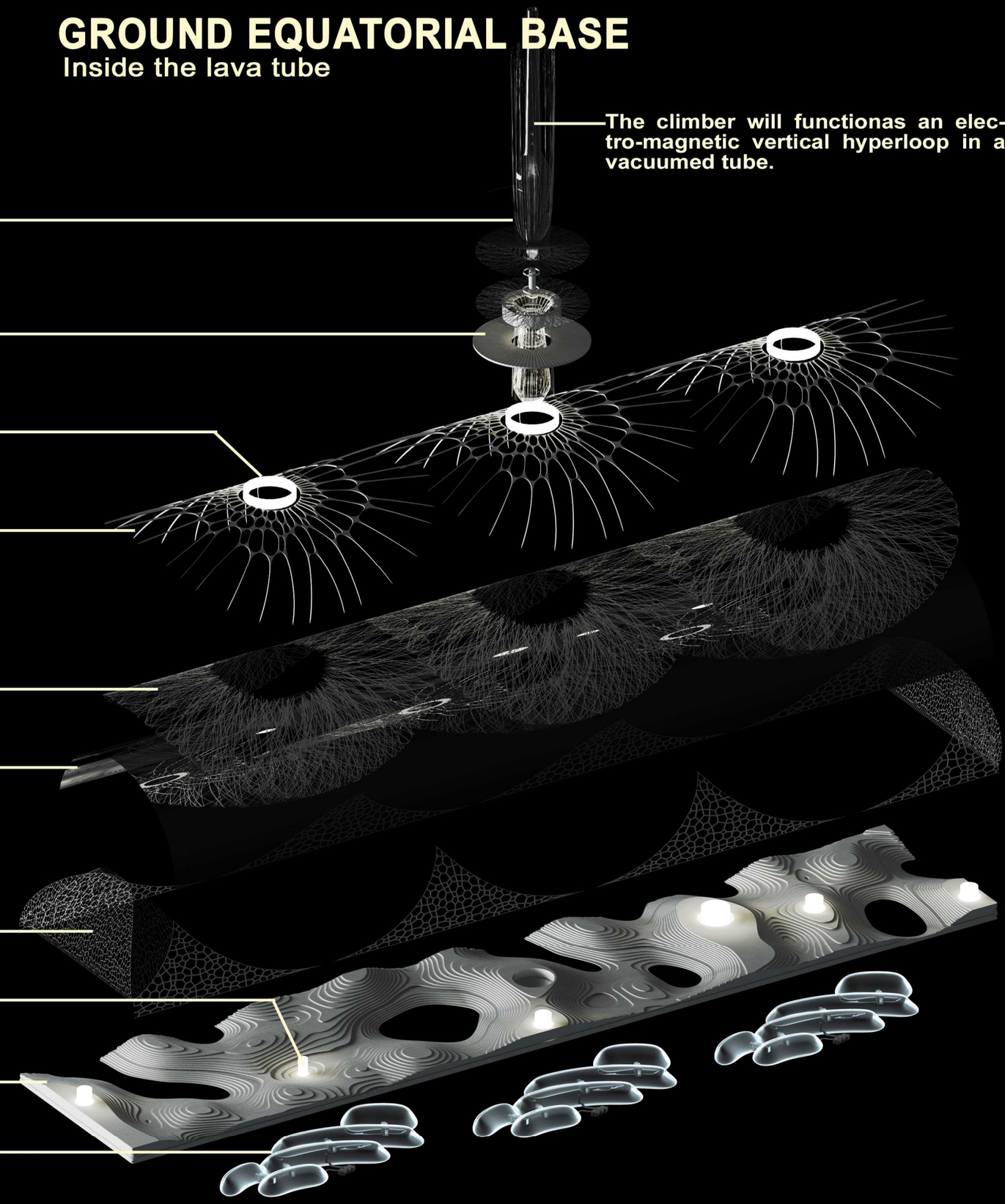
Artificial landscape formation used to host the bio-regenerative micro ecosystem of the closed loop village.

Subterrain inflatable units serving as sleeping and resting areas

GROUND EQUATORIAL BASE

Inside the lava tube

The climber will functionas an electro-magnetic vertical hyperloop in a vacuumed tube.



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PERMANENT INDUSTRIAL BASE

The main goal is to establish the first industrial base for moon mining of Helium 3 and rare earth elements to be shipped easily to earth in a low cost method. This will establish and maintain our first Lunar permanent presence on moon. and reduce the cost and risk of lunar exploration and beyond.

The Moon bears substantial natural resources which could be exploited in the future which may encompass processable materials that will help us to extend also to Mars and ship the necessary construction materials to Mars.

Industrial Moon mining facility

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2nd Principle

BIOMORPHISM

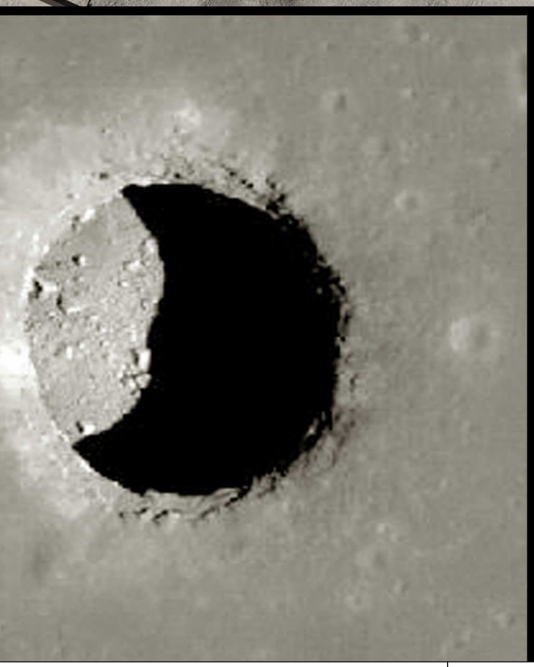
Biomorphisim is used to emulate Iris form and symbolic association. It tends to be only surface level, in association with the underlying natural systems. It mimics natural Iris in design through form and application. This approach was used to cover the Mare Tranquillitatis pit with the Iris capping the Pit and protecting the inner Lava cave colony from radiation and filtering all sun light entering the colony.

The concentric cirlces were planned to divide the surrounding site in a polar coordinate system sectors to plan and control the mining operations and to mitigate any risk or crises events that might occur from the elevator.
The Rectangural borders of the beneath Lava tube colony is contoured and cleaned to define the borders of the colony and to create flat landscape for the EVA operations for ease of maintenance.

0 20 40 60 100m

SELECTED SITE

Mare Tranquillitatis pit crater revealing boulders on an otherwise smooth floor. Image is 400 meters wide, north is up, NAC M126710873R. The depth to the width, which ranges from 100 to 115 meters (328 to 377 feet) across the sharp precipice. It is estimated that this pit crater is a portal to a Lava cave. Also the site is in good proximity to the Lunar equator to suit the building site of the orbital elevator



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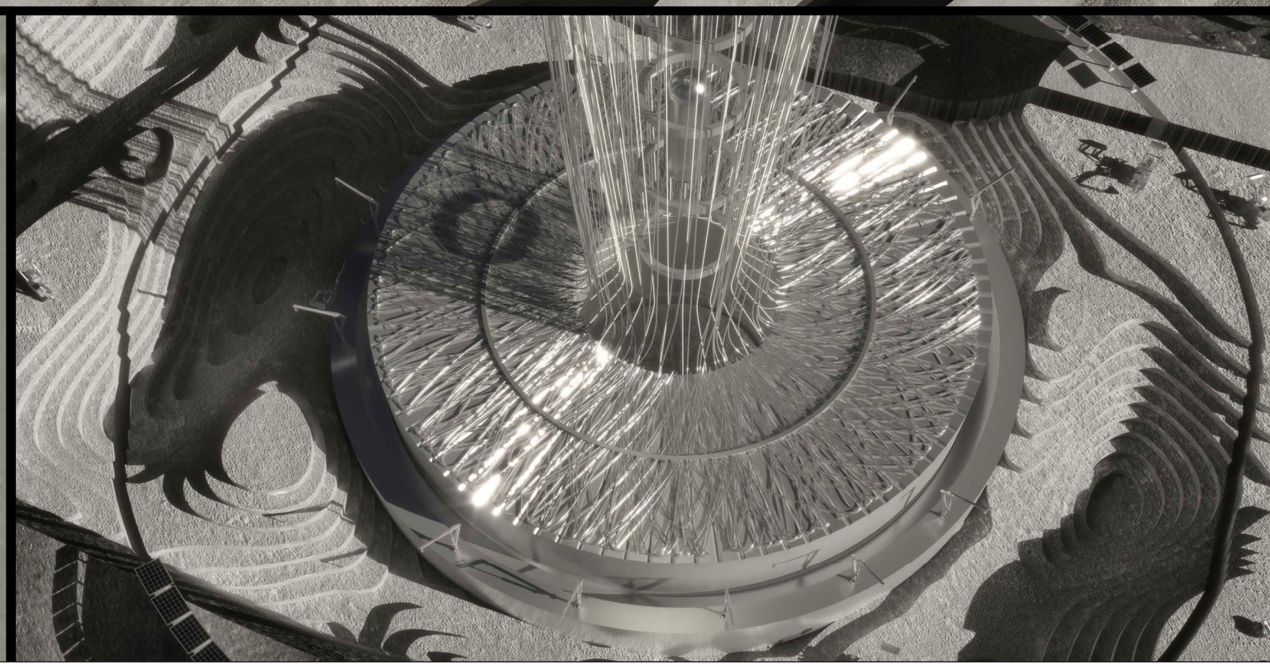

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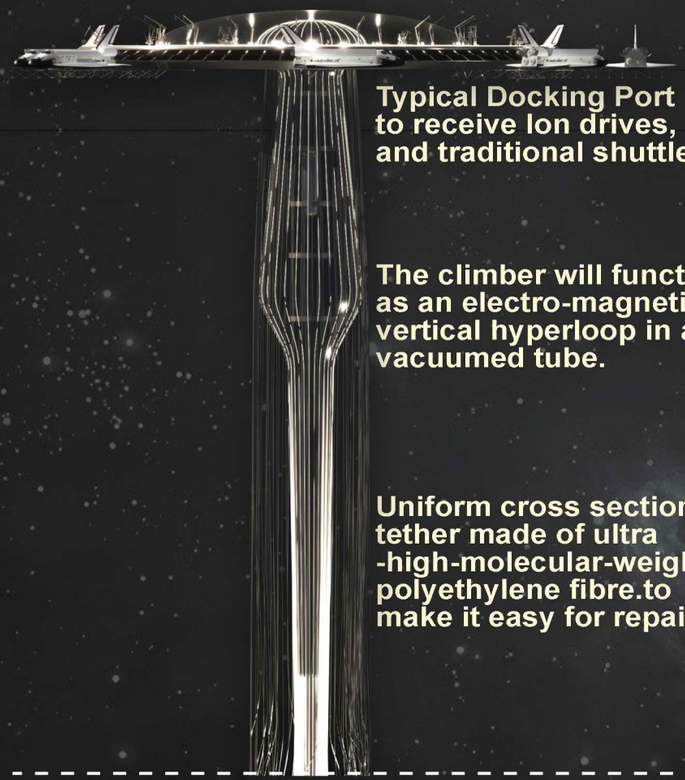

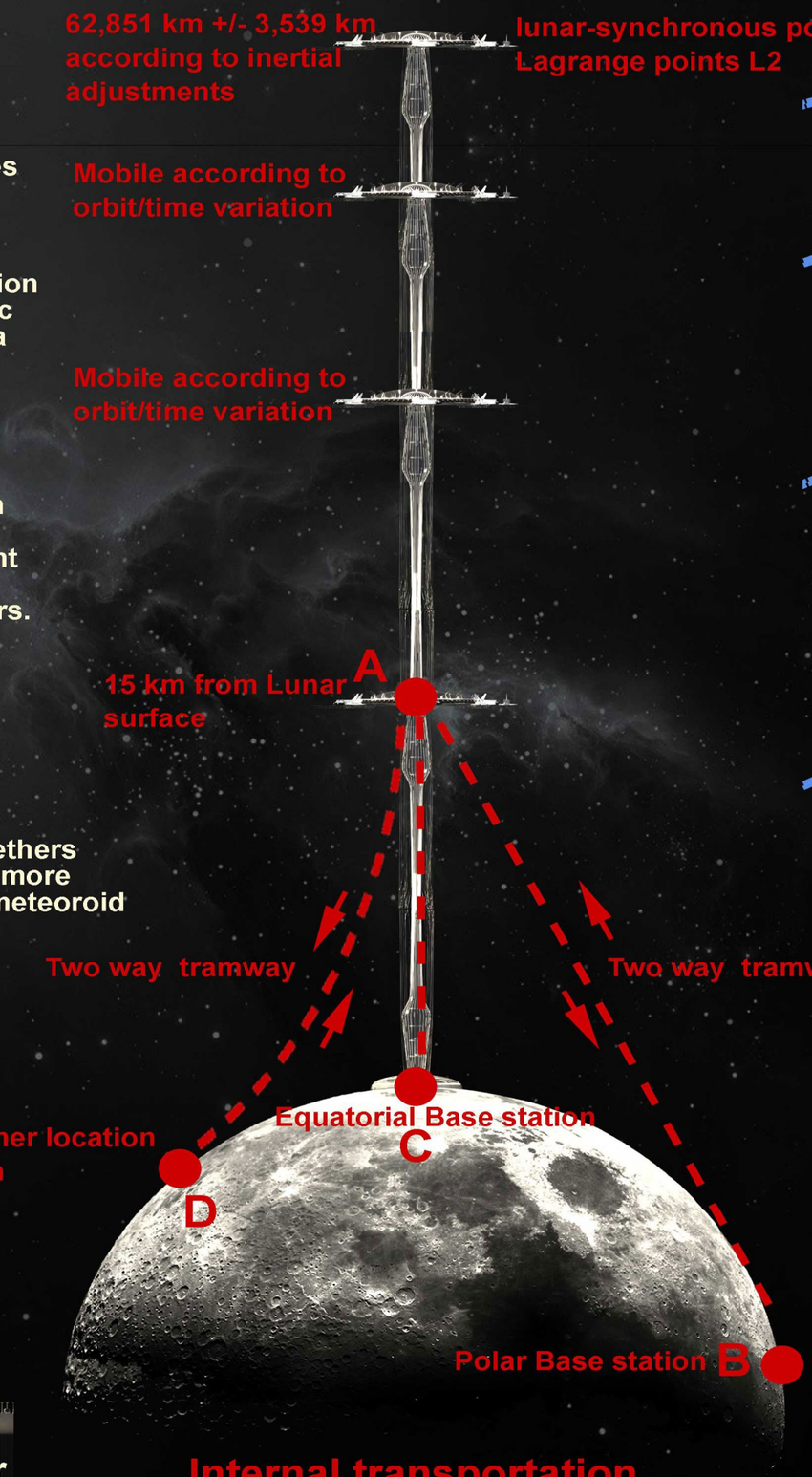

Internal transportation
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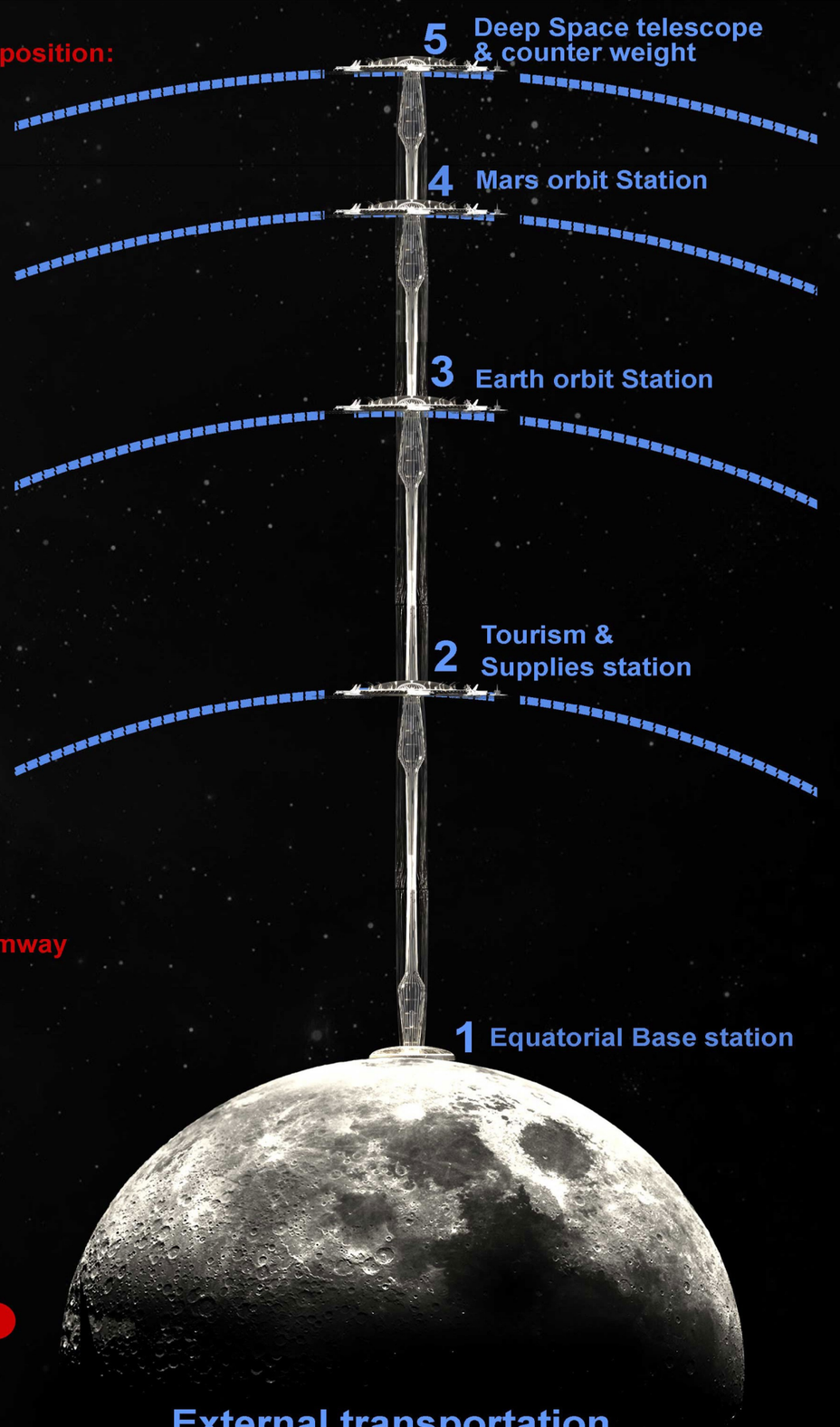

External transportation
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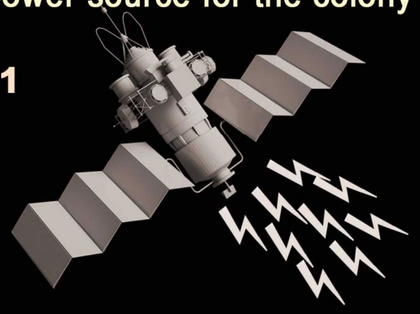
POWERING system on IRIS project

MULTI-POWERING SOURCES

Powering the whole base will be operated by 3 sources of power:
1.Using solar satellites orbiting around the south pole, and securing all connection with Earth
2.The Solar panels deployed at the rground base will transmit wireless microwaves also to the climber.
3.Nuclear batteries implanted at the middle to melt the iced water and provide main operating power source for the colony

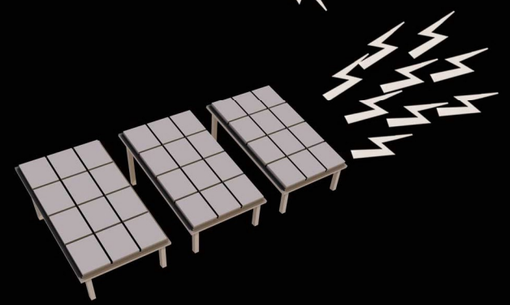
1



1. SOLAR SATELLITES

Space-based solar power (SBSP) is the concept of collecting solar power in outer space and distributing it to Moon surface through the array of circular solar panels of the top dock base. This will also provide the climber with enough power to operate.

2



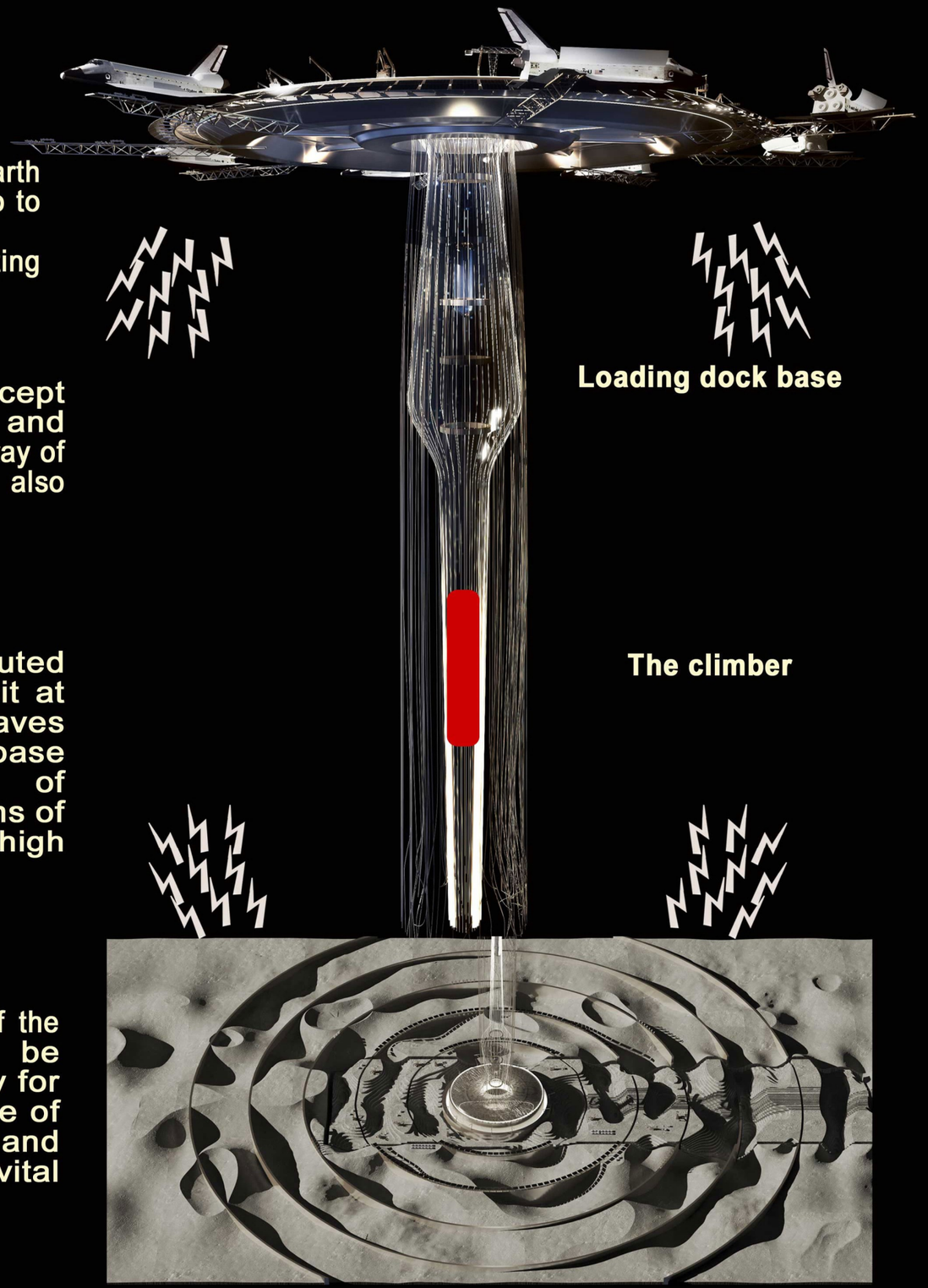
2. GROUND SOLAR PANELS

A circular array of solar panels will be distributed in the concentric circles surrounding the pit at the equatorial base to beam short microwaves beams to the climber and ground base operations EVA vehicles. The lack of atmosphere will help the uninterrupted beams of energy to reach the climber vehicle with high efficiency.

3

3. NUCLEAR BATTERIES

The 9 Nuclear batteries emplanted at the middle of the colony , They will be the last pieces to be transported after digging to power the colony for average 320 years. It will be the main source of energy to melt the frozen water for irrigation and life support system. It will also power all vital equipments for the lunar colony to operate.



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