MARS **ODYSSEY**

INTERNATIONAL MARS STATION

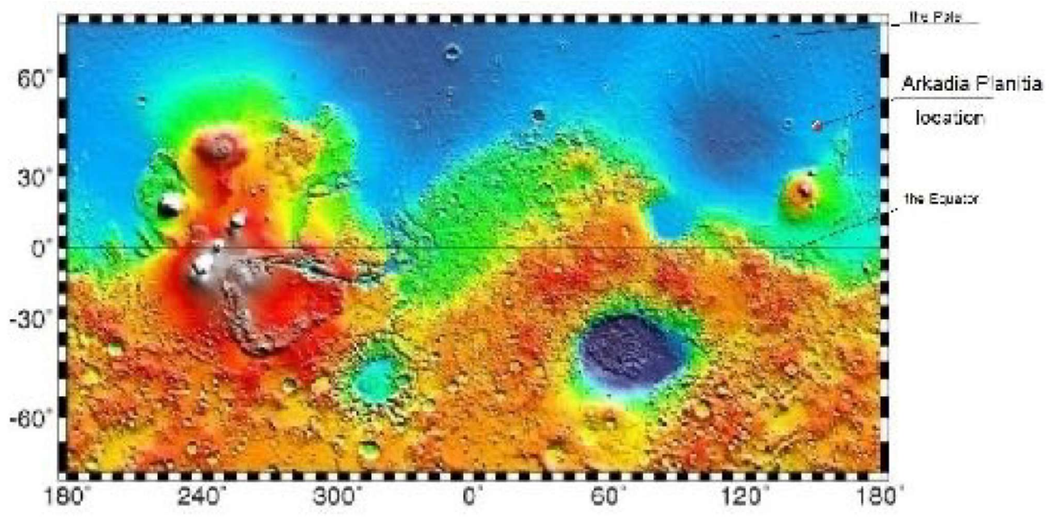
The project is located in (Arcadia Planitia-Mars) it is a set of laboratories that aim to develop sciences and technology to transform Mars into a habitable environment for humans

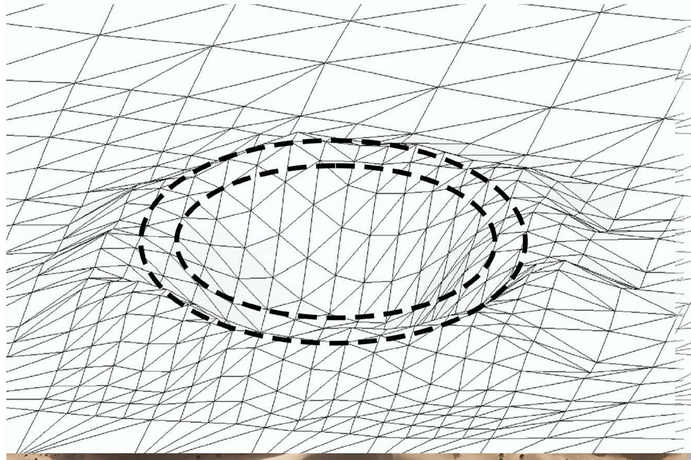
MARS ODYSSEY

The project is a set of laboratories that aim to develop and harness science and .technology to transform Mars into a habitable environment for humans
The project accommodates 200 male and female scientists of different nationalities, in addition to the possibility of receiving 40 visitors inside the facility. All the necessities of life inside the facility have been added to be self-sufficient in basic resources that meet the biological and psychological .comfort

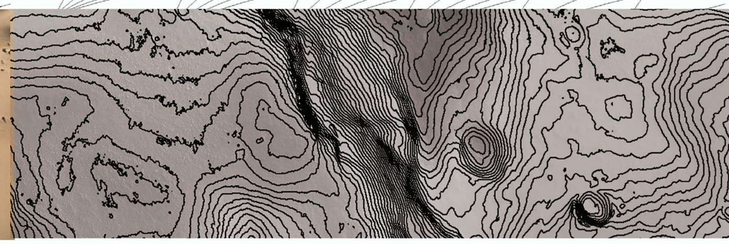
Localization

As a place of destiny for the Mars base, I chose Arcadia Planitia. The flatness, smoothness and the land-form without rocks allow making the base easier. It is mainly due to subsoil soft terrain . Moreover, there is an excess of ice , which is a very important resource of the colony. Because of this place, we can achieve a compromise between distance to deposits of ice around the Pole (which could support human settlements into water) and the Equator (which is the best place to land a rocket). It is also at a low elevation so it's good for better thermal conditions and solar power

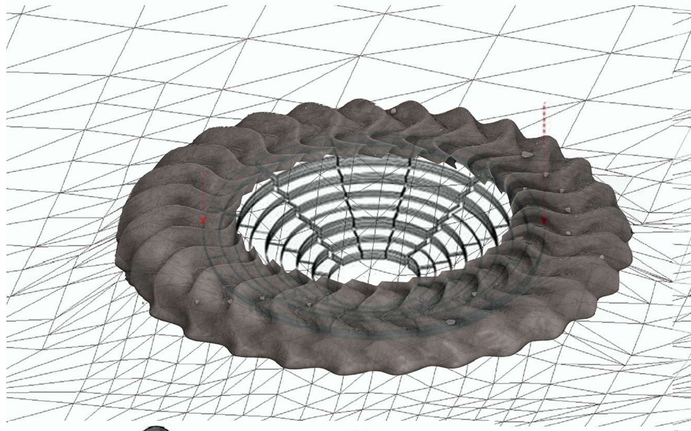


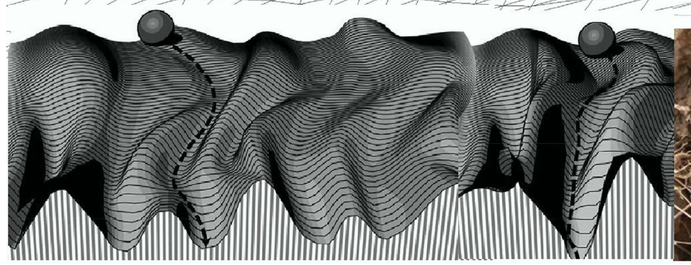


THE PRESENCE OF THE SOURCES NECESSARY FOR LIFE IN THE MIDST OF ANY UNHABITAT ENVIRONMENT MAY CREAT LIFE AROUND THIS SOURCE AND AND THE BEST EXAMPLE OF THIS IS THE OASIS IN THE DESERT FOR THIS



THE FLOORS WERE FORMED TO MATCH THE TOPOGRAPHY OF THE SITE ITSELF AND THE SURROUNDING ENVIRONMENT





THE OUTER SHELL WAS MADE TO RESIST WIND FROM ALL DIRECTIONS AND TO MATCH THE SHAPE OF THE SURROUNDING ENVIRONMENT

THE ROOFING AND THE REST OF THE BUILDING SERVICES WERE DONE TO WORK AS ONE PART LIKE AN ANT COLONY THAT WAS DESIGNED TO RESIST THE EXTREM ENVIRONMENT

Launch Site

ROVER HANGER

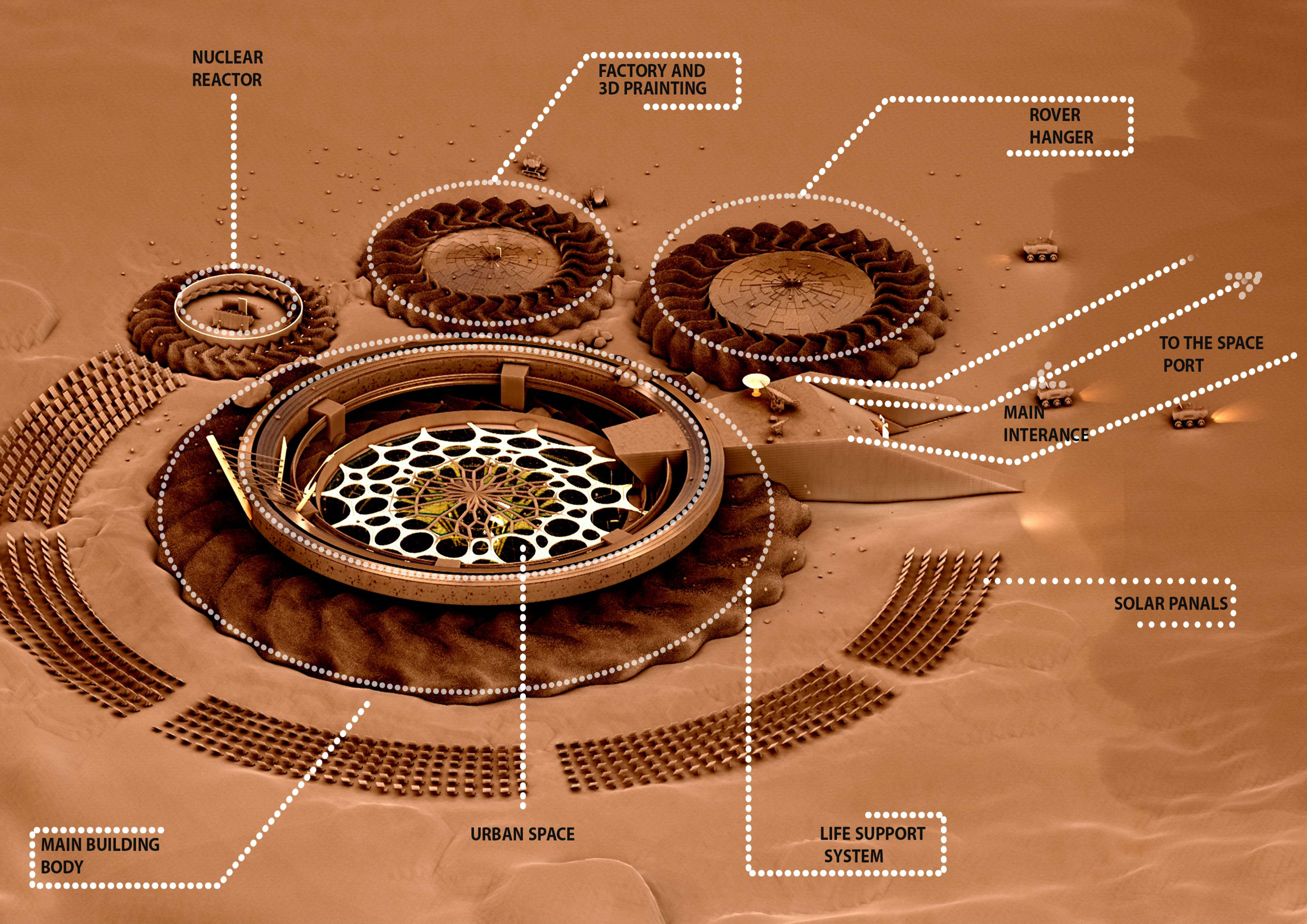
FACTURY FOR SMALL EQUOPMENT

Nuclear power Unit

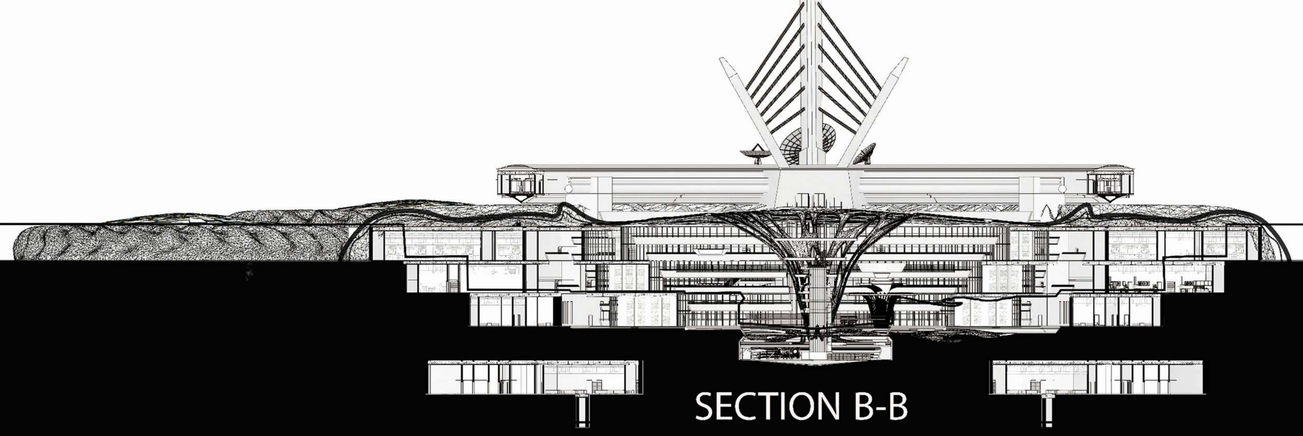
The main urban space

Destance to the entrance = 250 m

Possible Expansion Of The Colony


NUCLEAR
REACTOR
FACTORY AND
3D PRAINTING
ROVER
HANGER
TO THE SPACE
PORT
MAIN
INTERANCE
SOLAR PANALS
MAIN BUILDING
BODY
URBAN SPACE
LIFE SUPPORT
SYSTEM

SECTION A-A

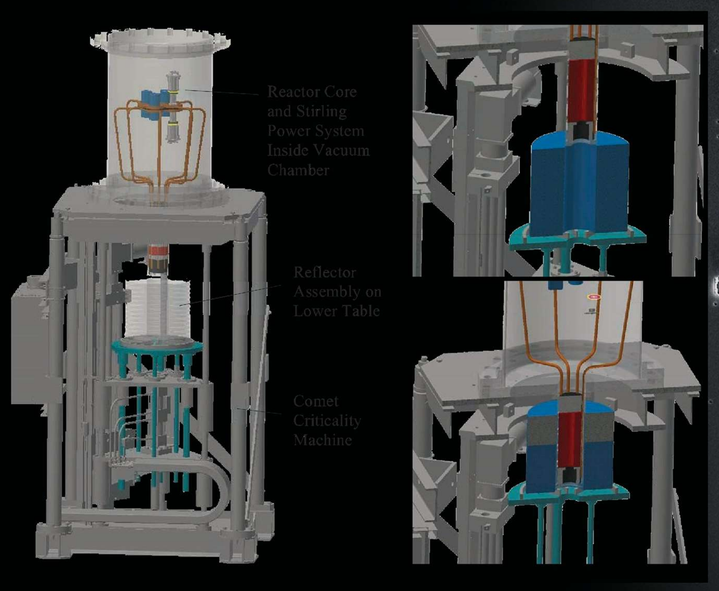


SECTION B-B

RESOURCE OF ENERGY

NUCLEAR REACTOR KILOPOWER

The main source of energy is a nuclear reactor Kilopower. It uses uranium 235 and as medium sodium that is safer than water due to its properties. The energy we partially use for the current use and for accumulation. Water, without a proper cooling system, can rapidly change to the steam that may cause an explosion of the reactor and contamination of the environment. To change heat energy to an electrical one, the colony uses Sterling motors together with synchronous motors on the same shaft. Due to current usage of the uranium and its resources on the Earth, it should be exchanged in fusion rector in 120 years. The wastes from the nuclear reactor are placed 300 m under the Martian surface

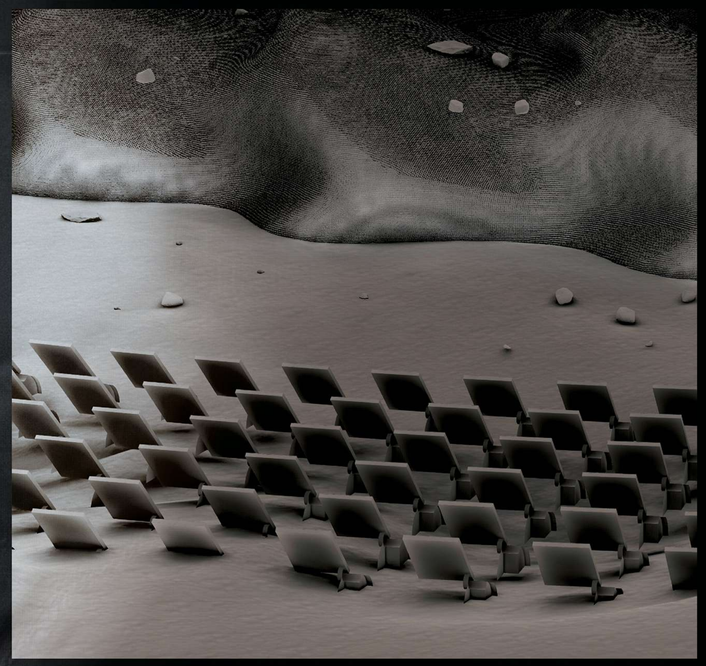


Assuming that for 4-6 person crew there is a need for 40kWh we estimate that for the village utility, for 240 people, around 1.6 MWh is necessarily for the safe operation

SOLAR PANALS

The additional source of energy is photovoltaic panels located in free spaces in the colony. Their size is 100 x 100 m and provide around 250 kWh. Maybe it is not the most efficient ways of energy acquisition but it is ecological, and we treat it as a back up for dangerous scenarios, for example when something goes wrong with nuclear reactor, and there is a need for people survival with the low energy consumption until the reactor is fixed

the batteries are placed nearby windmills that ensure uninterruptedly energy storage. The photovoltaic energy production is strongly related to the season. During summer periods, the maximum energy generated is around 120W/m2, however, during storm sols decreases only to 20W/m2



MARS COLONY
CHAPTER 1
INDEX

MATERIALS Found on mars :

GLASS MATERIALS

Found on mars :
-calcium
-silicon
-sodium oxide
-magnesium
-phenol
-urea
-sand

PLASTIC

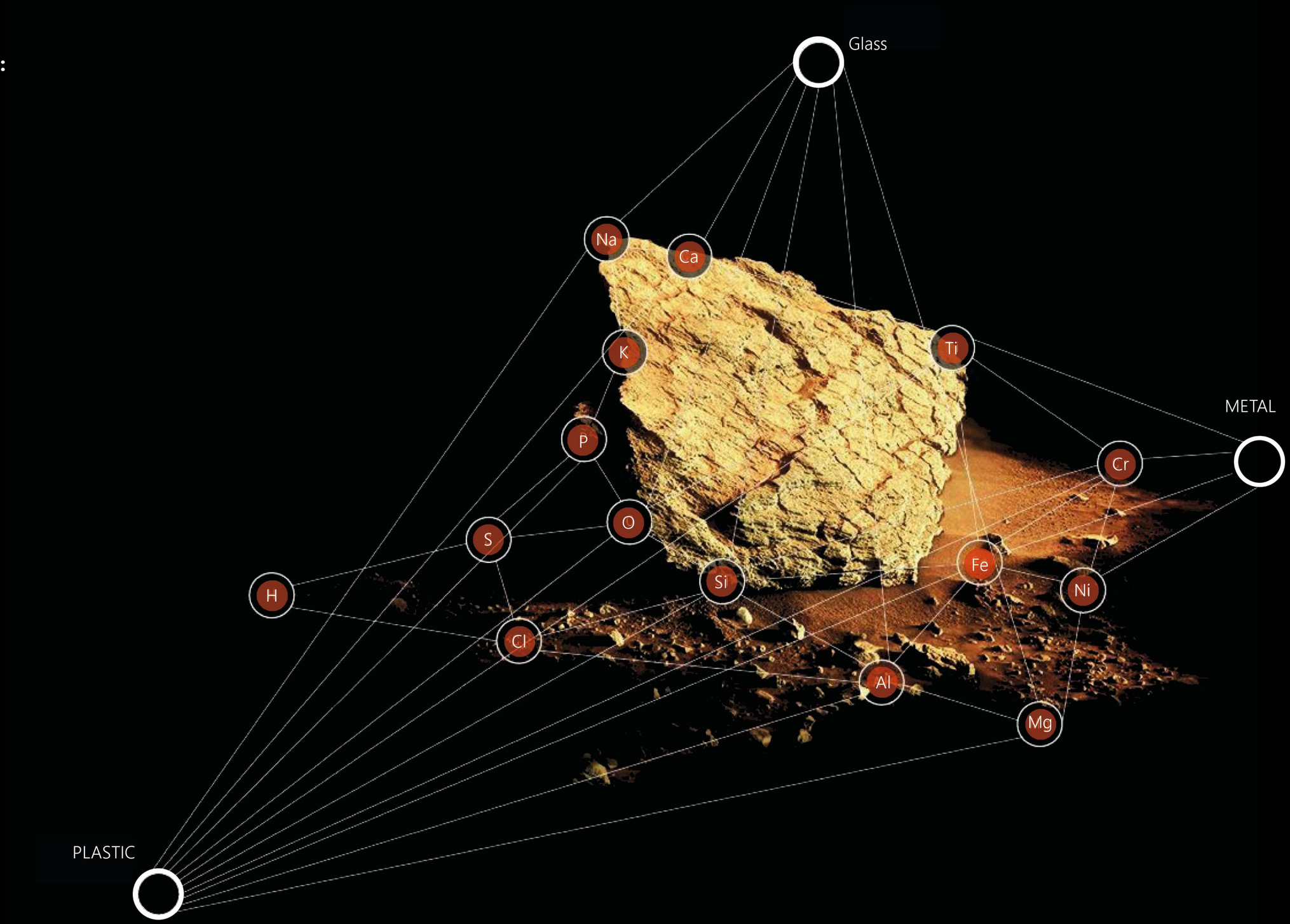
Found on mars :
-aluminium
-sodium
-calcium
-phosphorus
-titanium
-silicon
-chromium
-iron
-magnesium
-oxigen

METAL

Found on mars :
-aluminium
-titanium
-nickel-iron
-lithium
-cobalt
-nickel
-copper
-zinc
-niobium
-molybdenum
-gold
-iron

CEMWNTITIOUS MATERIALS

Found on mars :
-aluminium
-calcium
-silicon
-chromium
-magnesium
-vulcanic ash
-lime-stone
-iron
-alkali regolith



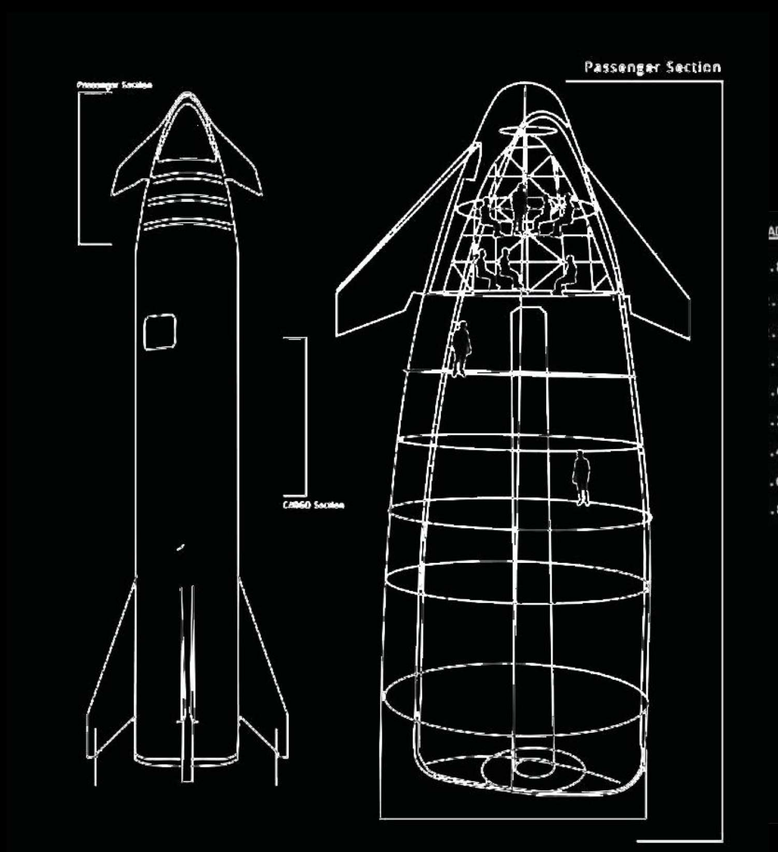
SHIPPING **NECESSARY INFRASTRUCTURE**

SHIPPING
compactability + deployment sending anything into space is very expensive. to be able to plan an efficient and successful manned mission for Mars, knowledge of heavy-lift orbital launch vehicles availability and their payload to Mars is required.

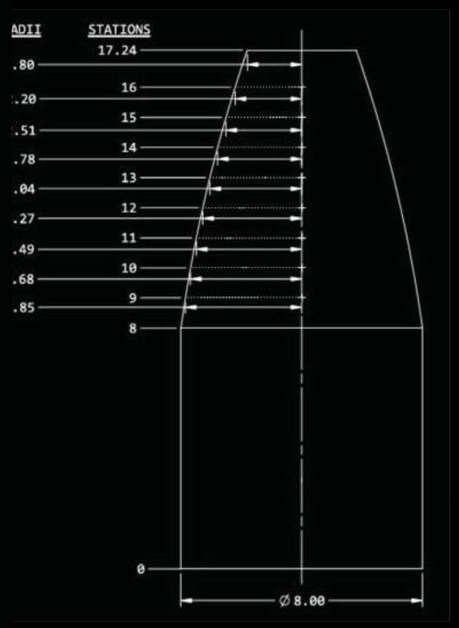
SPACE SHUTTLE :
Known Technology | SpaceX Starship
Diameter 9 meters
Payload Capacity 220K-330k lbs

CARGO:

Live astronauts	Launcher
Folded solar panels	Swarm tech robots
Wind turbine parts	Food for extended time
Prefab materials	Life support system
Raw printing material	Soil, Planters and Plants
3D Printers	Diggers and other constr
Space suits	cushion tools
Rovers	Spare parts
Satellites	Large transit vehicle



SpaceX' Starship Rocket



SpaceX' Starship Rocket

PRICE	FALCON HEAVY
STANDARD PAYMENT PLAN (2018 LAUNCH)	**$90M** Up to 8.0 mT to GTO
DESTINATION	**PERFORMANCE**
LOW EARTH ORBIT (LEO)	**54.400 kg** 119.930 lbs
GEOSYNCHRONOUS TRANSFER ORBIT (GTO)	**22,200 kg** 48.940 lbs
PAYLOAD TO MARS	**13,600 kg** 29.980 lbs

*Performance represents max capability on fully expendable vehicle

Inclination: LELO=28.5 . GTO = 27