

ÉVALUATION SPÉCIFIQUE POUR L'ATTRIBUTION DE LA MENTION « SECTION EUROPÉENNE »

Baccalauréat professionnel TCI / MELEC / SN

Session 2023

Épreuve orale

Durée de l'épreuve A et B : 20 minutes

Préparation : 20 minutes

A. Première partie : durée 10 mn, préparation : 20 mn

SUJET N° 1 Document candidat



Role play :

Some companies are auditioning people to work on projects for the future NASA mission Artemis V. As a candidate, you have to show them your knowledge about the Artemis program and that you are the right person for the job.

You are expected to :

- Introduce yourself and your motivation for the job
- Explain the Artemis mission and its goal.
- Select and present **the part(s)** of the projects which correspond(s) to **your professional specialty**.

Enclosure(s) :

Document 1 : The Artemis program

Document 2 : Project *Nova-C* lander

Document 3 : Project *Blompod* Moon habitat

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DOCUMENT 1 : The Artemis program

(adapted from <https://metro.co.uk/2020/04/07/nasa-reveals-plans-colonise-moon-astronaut-base-12519711/>)

Nasa has revealed plans to set up an astronaut base, the Artemis Base Camp, on the moon as part of its Artemis mission to return to the lunar surface. This base could then become a staging post for an eventual mission to Mars.

The US space agency has set out plans to build “Artemis Base Camp” to allow humans to live on the moon surface.

The habitat, located in the Shackleton Crater on the south pole, would allow four astronauts to live on the moon surface. They would get around using two vehicles designed for the tough conditions of the moon surface. A drone lander, operated from Artemis Base Camp, would deliver science and technology payloads all over the moon.

Artemis I (16/11/2022) was an uncrewed flight test of the spacecraft Orion. The goal was to place Orion into a lunar orbit and then return it to Earth.

Other missions are planned, Artemis II, III, IV and V. Artemis program’s goal is explore the lunar surface with the help of different technologies and infrastructures such as habitats, rovers or resource extraction equipment. These missions will prepare humanity for the long journey to Mars.



Orion spacecraft
(<https://www.esa.int>)

(adapted from https://en.wikipedia.org/wiki/Artemis_program)

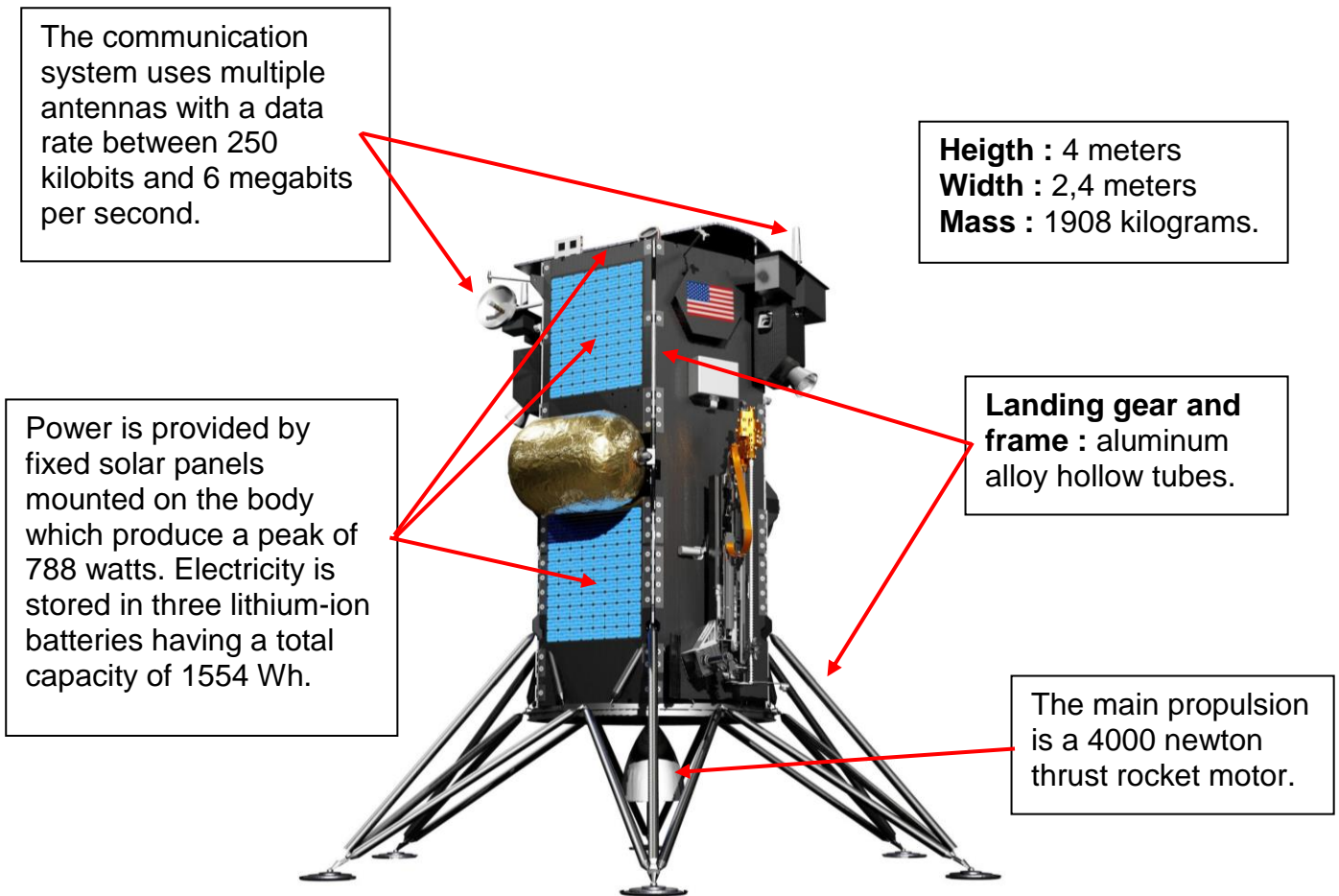


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DOCUMENT 2 : Project Nova-C lander
(adapted from <https://en.wikipedia.org/wiki/Nova-C>)

Nova-C is a lunar lander designed by the private company *Intuitive Machines* to deliver small commercial payloads (100 kg) to the surface of the Moon.

This lander is capable of relocating by performing a vertical takeoff, cruise, and vertical landing using an autonomous landing and hazard detection system. Each component is designed to survive the lunar day conditions.



(<https://www.houstonpublicmedia.org/nova-c-lander/>)

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DOCUMENT 3 : Project *Blompod* Moon habitat

(adapted from: <https://www.designboom.com/architecture/void-jakub-pietryszyn-blompod-moon-habitat-07-11-2022/>)

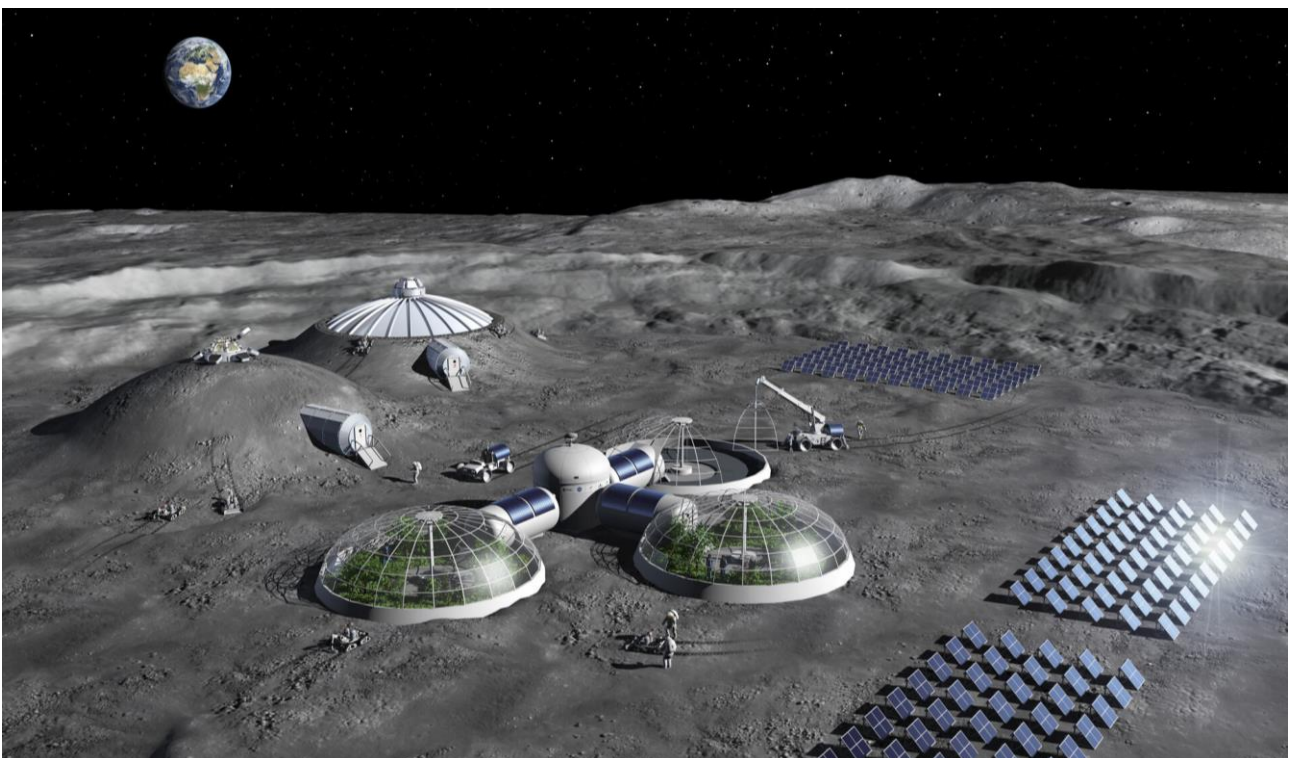
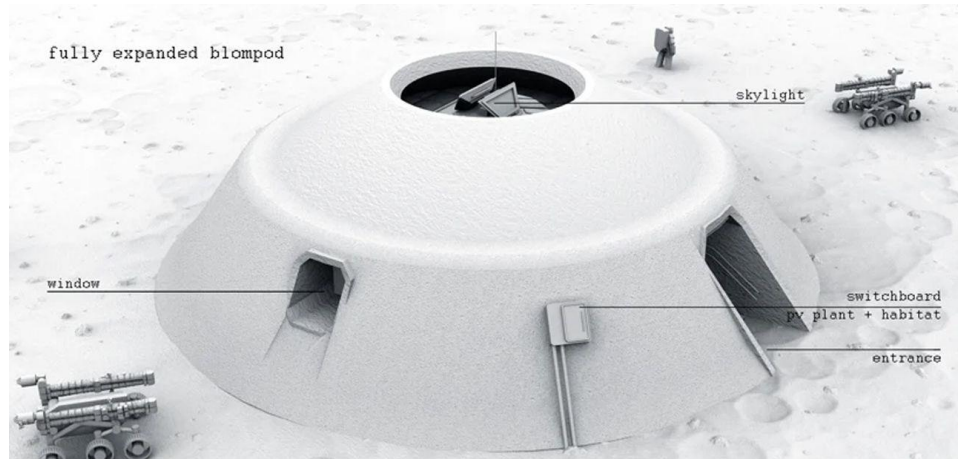
Architect Jakub Pietryszyn introduces “**Blompod**”, an expandable and inflatable Moon habitat designed for an upcoming space missions.

The concept uses lightweight, inflatable lunar human habitat that could be transported in compact, deflated form to the Moon.

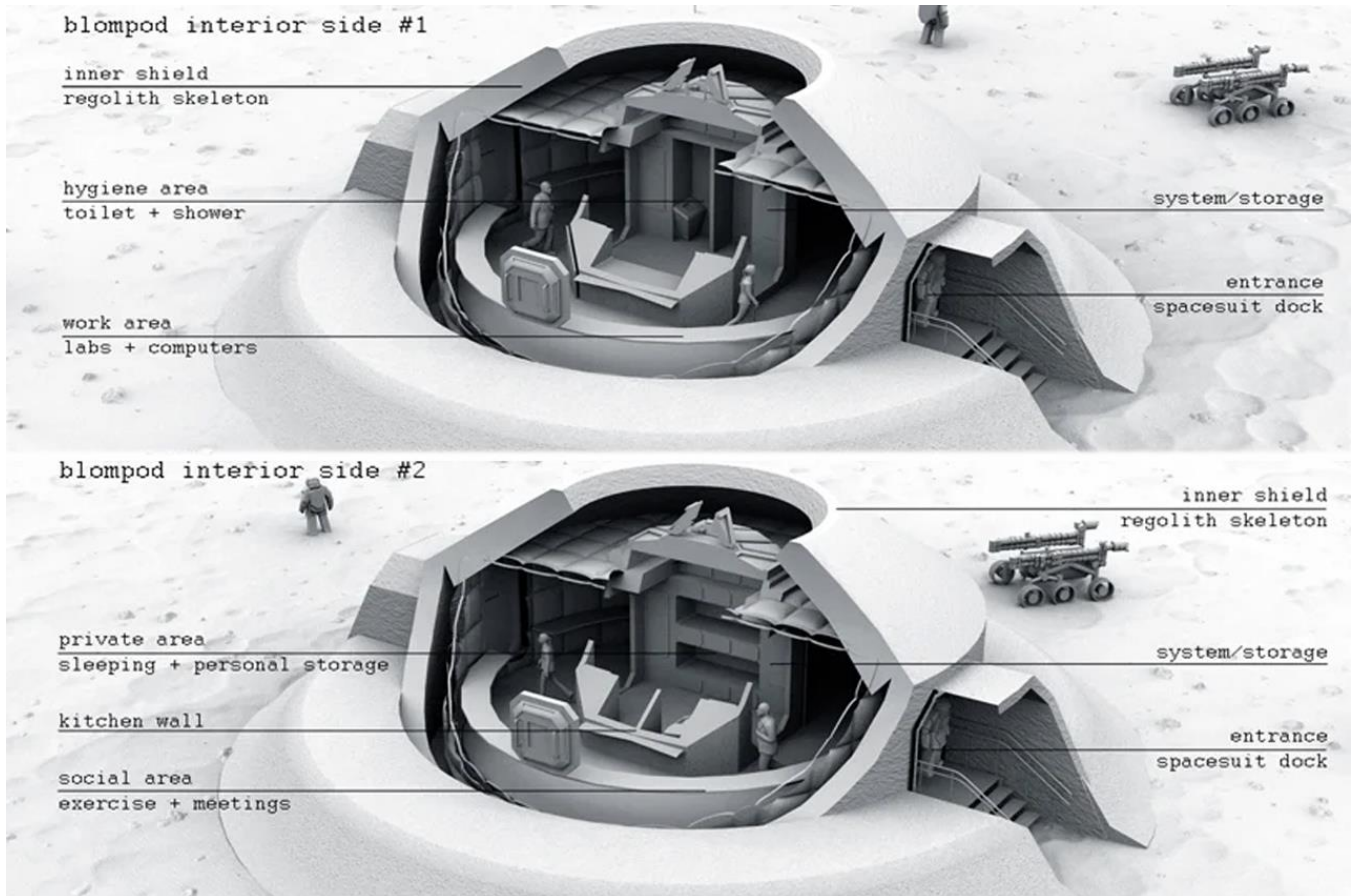


The structure is made of a rigid frame (welded hollow steel tubes) surrounded by an inflatable shell.

The structure is reinforced by walls of local dust and broken rocks (regolith) for insulation against sun radiations.



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Power (*outside the habitat*) :

Nuclear fission power station which can generate 40 kilowatts.
Solar panels (during the lunar day).

Analysis, maintenance and repair laboratories (*work area*) :

Study of the lunar soil in order to extract resources necessary for manufacturing and maintenance.

Maintenance and repair of all the devices of the Moon base.

Computer network (*work area*) :

Management of life support systems, electrical network, energy production and communications.

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