



World Space  
Week 2019-20

The background of the entire graphic is a dark, starry space scene. In the foreground, two astronauts in white suits stand on a rocky, cratered surface. To their right, a futuristic lunar rover with a dome-shaped habitat is parked. A large, glowing blue arrow points upwards from the center of the text towards the top of the frame.

# SPACE Habitat CHALLENGE

*Senior*

Organised by VSSC | IISU | LPSC

The Earth is the cradle of humanity, but mankind cannot stay in the cradle forever.

Konstantin Tsiolkovsky



# the mission

Here is a chance to give wings to your curiosity and embark on a journey to secure the future of humanity!

You are a team of space scientists tasked with a challenge to find a new world and build a human habitat there. Unleash your imagination and with all the technology humans have managed to develop, set out on an adventure to ensure the survival of human race.

**Find a new world,  
Build Infrastructure ,  
Harness Energy,  
and sustain life for the posterity**

# the rules

- The event is open to undergraduate students from Kerala & Lakshadweep
- A team of 3 to 5 members (not essentially from the same college) can enter the challenge
- The event has two rounds
- **Preliminary round:**
  - Submit a report detailing your design and ideas in not more than 30 pages
  - The report shall include a concise mission proposal as well as an elaborate technical assessment on any specific area of your choice in the proposed mission
  - More weightage shall be given to the area specific assessment
  - Originality in content will be appreciated and citations shall be provided wherever applicable
- **Final round:**
  - 5 teams selected from the preliminary round shall have the chance to present their design to us
  - Online presentation shall be limited to a maximum of 45 minutes each

# the new world

## Your Challenge

Identify an extra-terrestrial body that can host human life for the years to come - planets, moons, exoplanets, asteroids....

## Something to get you Thinking

- Duration of travel from earth
- Terrain
- Conditions to support human life
- Goldilocks zone
- Resource availability

*"If the dinosaurs had had a space program, they would not be extinct."*

**Michael Griffin**

# the habitat

**Your Challenge :** Contrive to design a permanent settlement for humans in the new world

## Supporting Life?

How do you produce oxygen, control humidity, shield from extreme temperature

## Communication?

Define the choice of systems for communication among co-inhabitants

## Shelter?

Technologies needed to provide shelter from radiation, shield from micro-meteorite impact and weather elements

## Travel?

How to travel within the planet?

## Waste Management?

Recycle Liquid Waste, Disposal of CO<sub>2</sub> and solid waste

# the energy source

## Your Challenge

Though you are not restricted to import essential materials from Earth through multiple space missions, considering sustained human habitat, in-situ generation of energy is essential. Hybrid schemes of energy generation depending upon the selection of host body may be planned

### Something to get you Thinking

- Identify sustainable energy sources
- Propose a power generation scheme
- Device energy storage schemes
- Power management & Distribution



# the food

## Your Challenge

Generate food and drinking water for a sustained human habitation on an extraterrestrial body. Limitations on types of food, essential diets to be followed and preserving food for the low-power conditions are to be considered. A closed ecological system to be envisaged through proper recycling

## Something to get you Thinking

- Space farming as an extended version of 'Veggie'
- Extracting water from host body
- Carrying packed food from Earth as buffer stock
- Synthetic food and feasibilities of cooking



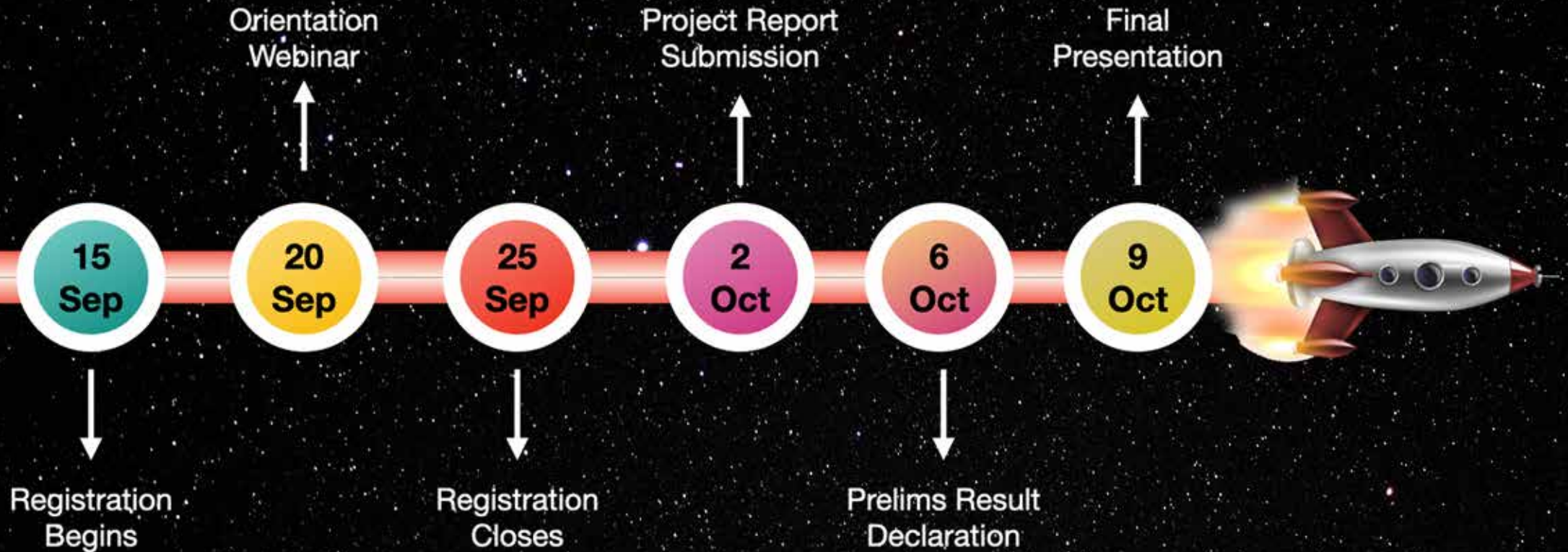
# how to participate



## Note:

1. Identify a Suitable Name for your Team
2. Registration shall be done using the Gmail ID of the team leader
3. School ID or signed declaration from school shall be uploaded as part of registration
4. Report shall be submitted in pdf format (file size < 30Mb)
5. All communication/intimations will be through the registered Gmail ID, including confirmation of registration, link for orientation webinar and report submission

# the timeline



## For details contact

Technology Challenge Committee

World Space Week - 2021

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