



## Context

The 1st Brazilian Symposium on Space Agriculture (SIAE) represents an important milestone in the context of the contributions of Brazilian agricultural research in Lunar exploration. This event brings together experts, researchers and institutions to discuss and share knowledge about the development of techniques and technologies related to the Space Farming theme, as outlined in the Artemis agreement. Through lectures, round tables and presentations of scientific work, the symposium aims to promote the exchange of experiences and foster collaboration between the various experts involved in this emerging field. With the active participation of the Brazilian scientific community, the I SIAE contributes to boosting the research and innovations necessary for the cultivation of plants in extraterrestrial environments, in line with the objectives of expanding space agriculture set out in the Artemis Agreement.

**OCTOBER 14-16, 2025**

**São José dos Campos Technological Innovation Park (PIT)  
São José dos Campos, SP, Brazil**



**DAY 1 - October 14, 2025****Theme: Artemis Accords and Space Exploration**

The panel will begin with discussions on the impacts, challenges and opportunities provided by the Artemis Accords in the context of space exploration. During the panel, participants will have the opportunity to discuss the importance of the Artemis Accords for the advancement of space exploration, the goals and objectives established for lunar and Martian missions, as well as the international collaborations involved in this process. In addition, topics such as the sustainability of space activities, the technological innovation required for long-term space exploration and the socioeconomic impacts of human presence on other celestial bodies will be addressed. The panel thus seeks to promote reflection and debate on the horizons of space exploration driven by the Artemis Accords and the opportunities for cooperation and scientific development in this scenario of expanding human presence in space.

13h - 14h	Welcome
14h - 14h30	Opening Ceremony
14h30 - 15h30	Magna Opening Lecture - Challenges and Opportunities of Space Exploration <i>Ivair Gontijo - JPL</i>
15h30 - 16h	Coffee-break
16h -17h50	Topic: Brazil in Space: Contributions and Perspectives into the Artemis Accords Context Rodrigo Leonardi , Director of Portfolios of the Brazilian Space Agency (AEB)  Panelist 1 - Sonia da Costa - MCTI Panelist 2 - Adenilson da Silva - INPE Panelist 3 - José Henrique Pereira - FINEP Panelist 4 - Ivair Gontijo - JPL Panelist 5 - Clenio Pillon - Embrapa
17h50 - 19h	Welcome Reception

## DAY 2 - October 15, 2025

### **Theme: "Brazilian Contributions to Space Farming Research"**

Objective: The panel will begin with discussions on impacts, challenges and opportunities provided by the Artemis Accords in the context of space exploration. During the panel, participants will have the opportunity to discuss the importance of the Artemis Accords for advancing space exploration, the goals and objectives established for lunar and Martian missions, as well as the international collaborations involved in this process. In addition, topics such as the sustainability of space activities, the technological innovation necessary for long-term space exploration and the socioeconomic impacts of human presence on other celestial bodies will be addressed. The panel thus seeks to promote reflection and debate on the horizons of space exploration driven by the Artemis Accords and the opportunities for cooperation and scientific development in this scenario of expanding human presence in space.

8h - 08h30	Topic: Space Farming in Brazil Alessandra Fávero - Embrapa Pecuária Sudeste
	Discussion Panel:
8h30 - 8h40	Paulo Hercilio Rodrigues - ESALQ/USP
8h40 - 8h50	Gledson Diniz - INPE
8h50 - 9h	Priscila Fernandes - ITA
9h00 - 9h50	Discussion
9h50 - 10h10	Coffee-Break

### **Theme: Challenges and Opportunities in Plant Growth in Space**

Objective: The panel will address the impacts of cosmic radiation, microgravity, extreme temperatures and other environmental factors on space agriculture. The effects of these elements on plant health, crop development and food production in extraterrestrial environments will be discussed. Participants will have the opportunity to explore strategies for protecting plants against the harsh conditions of space, as well as the technological innovations needed to ensure the success of agriculture in non-terrestrial environments. The objective is to understand the specific challenges faced by space agriculture and discuss solutions to ensure sustainable food production beyond Earth.

## DAY 2 - October 15, 2025

- 10h10 - 11h10      Topic: Growing in Space: Overcoming the Challenges of Radiation, Microgravity and Other Extreme Events  
*Stefania de Pascale (Universidade de Napoles Federico II) e Richard Barker (University of Wisconsin)*
- 11h10 - 12h00      Discussion Panel  
Carlos Hotta - IQ/USP  
Maria Cecília Conceição Évora - IEAv  
Felipe Purquerio - IAC
- 12h00 - 14h00      Lunch

### **Theme: The effect of space environment in the plant development**

The panel aims to explore the challenges and opportunities related to the development of plants in extraterrestrial environments. The impacts of cosmic radiation, microgravity, extreme temperatures and other environmental factors on the health and development of plants will be discussed. Participants will have the opportunity to analyze strategies to study the response of plants to these adverse conditions, as well as to optimize their growth in non-terrestrial environments. The panel seeks to promote understanding of the specific challenges faced by plants in space and foster discussions about the solutions and innovations needed to ensure the success of space agriculture.

- 14h10 - 15h50      Topic: Plant biology in space  
*James Green (retired chief scientist - NASA), Luca Nardi (ENEA) e Rob Ferl (UF)*
- Discussion Panel  
Gustavo Maia Souza - UFPel  
Katia Scortecci - UFRN  
Andrew Palmer -Florida Institute of Technology
- 15h50 - 16h10      Coffee-break

## DAY 2 - October 15, 2025

### Theme: Generation of genetic variability in Space

The panel aims to explore the potential of inducing mutations in plants in the extraterrestrial environment to produce new genetic variability. Participants will have the opportunity to analyze how genetic variability generated in space can be applied to the development of crops that are more resistant to environmental stress, more nutritious and more productive, contributing to global food security and agricultural sustainability in the face of intensifying stress. The panel seeks to promote understanding of the advances and applications of inducing mutations in space, both for space exploration and for direct benefits in terrestrial agriculture.

16h10 - 18h    Topic: Expanding the Frontiers of Plant Genetic Improvement in space

*Pooja Mathur (IAEA)*

Discussion Panel

Antonio Figueira - CENA

Maurício Pazianotto - ITA

Larissa Vendrami - Embrapa Hortaliças

18h - 19h    Poster Session

19h - 22h    *Movie in the park - The Martian - with a presentation on the scientific aspects of the film by Dr. James Green (former NASA chief scientist)*

## DAY 3 - October 16, 2025

### Theme: Use of microorganisms in space cultivation models

The panel aims to expand discussions on the effects of spatial conditions on microorganisms of agricultural interest, especially related to 1. Composition of soil microbiota associated with chickpea and sweet potato crops and their changes due to ionizing cosmic radiation and microgravity; 2. Association of extremophilic microorganisms, specifically lithotrophs, and their interaction with regolith simulants, in the solubilization of minerals of nutritional interest in cultivars. The panel seeks to discuss the possibilities of research in a simulated environment and experiments in space.

## DAY 3 - October 16, 2025

8h - 09h50      Topic: Experiments with microorganisms in space conditions  
*Luis Zea (Starlab Space) e Flávia Fayet-Moore (FOOD IQ)*

Discussion Panel  
Paulo Lacava - UFSCar  
Douglas Galante - USP  
Camila Patreze UniRio

09h50 - 10h10      Coffee-Break

### Theme: Sending biological experiments to space

This panel aims to show successful experiences in sending experiments with biological components, mainly plants, on satellites or to the International Space Station, their results and differences observed when compared to controlled conditions on Earth.

10h10 - 12h00      Topic: Experiences in sending biological experiments in environments with microgravity and ionizing radiation  
Speakers: Stefanie Countryman (BIOSERVE) and Anna-Lisa Paul (UF)

11h10 - 12h00      Discussion Panel  
Adenilson da Silva - INPE  
Wagner Vendrame - UF  
Lucas Fonseca - Airvantis

12h00 - 12h20      Closing Session

12h00 - 13h30      Lunch

13h30 - 17h30      VISIT AT INPE and EMBRAER