



Barley cultivation experiment using Martian regolith simulant and brewing byproducts launching to the International Space Station to advance sustainable agriculture for future Mars missions

Image Credit: Jaguar Space/Ivan Castro Guatemala.



FOR IMMEDIATE RELEASE.

EXPERIMENT TOWARDS TURNING MARTIAN REGOLITH INTO SOIL LAUNCHING TO ISS THIS THURSDAY

Cape Canaveral, FL, USA – July 29, 2025 — Jaguar Space, the bioastronautics consulting and access-to-space firm, today announces that the OASIS (Optimizing Agriculture in Simulated Interplanetary Soils) payload is scheduled to launch to the International Space Station aboard NASA's Crew-11 mission on July 31, 2025. The Falcon 9 rocket will lift off from Kennedy Space Center, with docking at the ISS expected in early August.

The OASIS experiment, led by researchers at Texas A&M AgriLife with support from Starbase Brewing, represents a groundbreaking investigation into sustainable agriculture for future Mars missions, testing how barley (*Hordeum vulgare*) grows in sterilized Martian regolith simulant enhanced with recycled brewing byproducts and a selected microbial

consortium. This novel approach addresses critical challenges for long-term human space exploration by examining plant-microbe-mineral interactions in microgravity conditions.

The experiment will germinate barley seeds in sterilized JSC-Mars-1, a Martian regolith simulant, augmented with recycled brewing byproducts to improve soil fertility and structure. Microbes were also introduced to facilitate nutrient transformation and organic matter breakdown, simulating the complex biological processes essential for sustainable agriculture on Mars.

To assess how barley leverages the soil environment in microgravity, researchers will measure plant nutrition and morphology, analyze recruitment and communication with microorganisms in the rhizosphere using ultra-high resolution mass spectroscopy (FT-ICR-MS), and evaluate metabolic function of microorganisms through sequencing. The study will also monitor ecological indicators including greenhouse gases and other volatile organic compounds, comparing microgravity-grown plants to Earth-based controls.

The OASIS experiment specifically tests the hypothesis that the breakdown of soil organic matter, nutritional reliance on the soil environment, and regulation of greenhouse gases will be altered in microgravity compared to terrestrial conditions. The research aims to evaluate the use of Martian regolith to support sustainable plant growth in reduced gravity conditions, potentially paving the way for sustainable agricultural practices in future Martian colonies.

Mission: NASA Crew-11 (Expedition 73/74)

Currently scheduled launch date/time: 12:09 p.m. EDT, July 31, 2025

Project Partnership

The OASIS experiment represents a unique collaboration between academic research, commercial innovation, and spaceflight expertise:

Texas A&M AgriLife leads the experimental design, execution, and analysis, with Dr. Julie A. Howe, Dr. A. Peyton Smith, Harrison Coker and Caleb Shackelford directing the research and data analysis efforts.

Starbase Brewing, with CEO Nate Argroves, supports the projects and provides essential brewing byproducts that serve as soil enhancement materials, while offering expertise in fermentation processes relevant to the experimental design.

Jaguar Space provides access to space, spaceflight design and implementation, and coordinating with NASA and SpaceX to enable the experiment's execution aboard the International Space Station.



OASIS Payload Patch.

About Jaguar Space

Jaguar Space is a bioastronautics and access-to-space firm, helping customers turn space into a competitive advantage. With deep expertise in spaceflight research, international collaboration, and commercial strategy, Jaguar Space supports clients across government, academia, and industry in navigating and thriving within the global space economy.

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