



Advancing Opportunities for Ag-Tech in the Space Environment:

**Mutation Breeding Programs, Closed-Loop
Developments, and Exploring Future Opportunities**

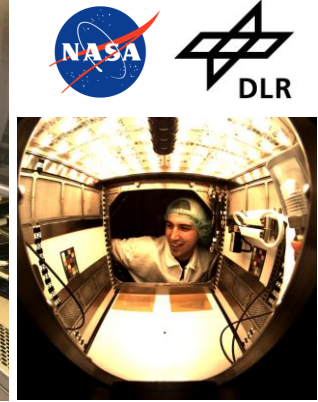


Connor Kiselchuk, M.S.
Lead of Science Operations,
StarLab Oasis



Connor Kiselchuk

- Lead of Science Operations for StarLab Oasis 
- M.S. from the University of Guelph 
- NASA Kennedy Space Center 
- VEGGIE Plant Payloads
- Deutsches Zentrum für Luft- und Raumfahrt 
(DLR)
- EDEN ISS
- Jeff Schell Fellowship (Bayer CropScience)



THE CHALLENGE

Worldwide, 12 Million hectares of land valuable to agriculture are lost every year

Global agriculture production will need to increase by 70% to meet the demand of an expanding population in 2050, 70% of which will be living in urban areas

At the same time; as space mission durations and distances increase, relying on in-situ production of food in space becomes the only viable option

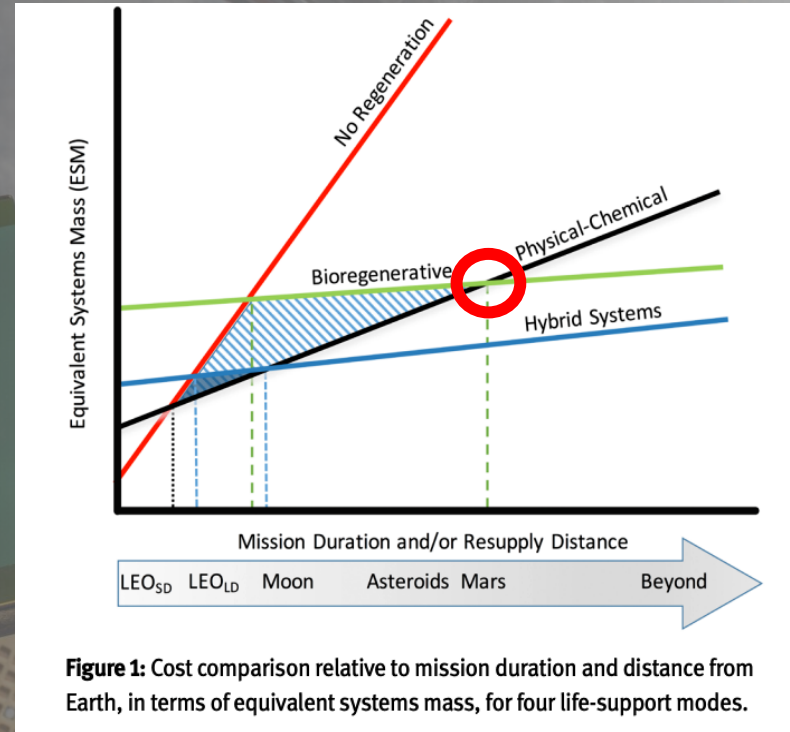
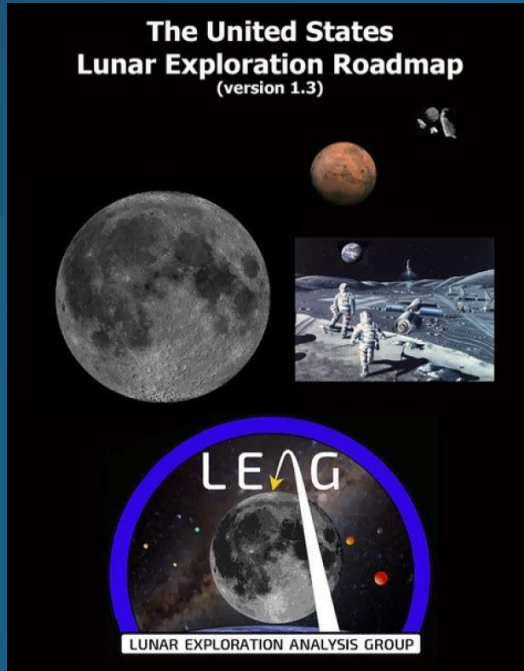


Figure 1: Cost comparison relative to mission duration and distance from Earth, in terms of equivalent systems mass, for four life-support modes.

Commercialization of Food Production in Space



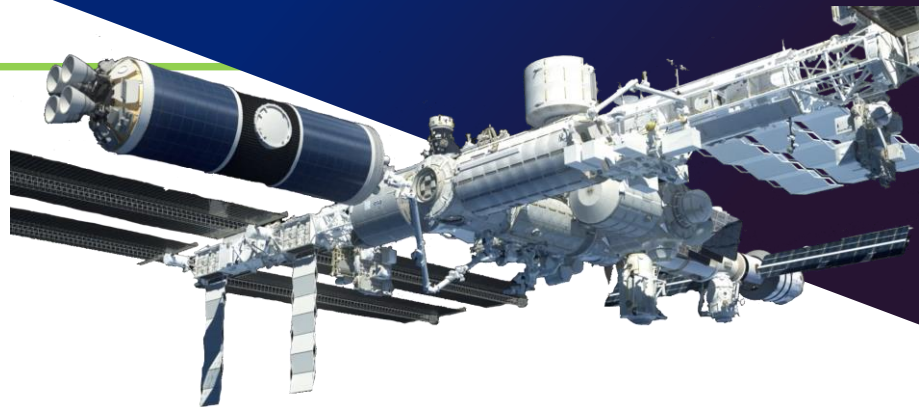
It only starts at the Moon...

- Agricultural IP Development
 - Lots of gaps still present!
- International Lunar Resource Prospecting Campaign
- Space Tourism/Entertainment



Our Mission

- Become a leading entity that enables the utilization of space to develop agricultural technologies
- Lead development of off-Earth food production systems to sustain future space voyagers



Our Vision

- A future of sustainably grown food for humanity, anywhere in the universe

Original Team



Qamar AlShorafa
Intern



Allison Waterman
Intern



Matthew Jagdeo
Intern

Part of our DNA: StarLab Oasis began with a multinational group of talented interns. Full time hires have also come from a similar pathway

Current Team



Allen Herbert
General Manager and Co-Founder



Benjamin Greaves
Engineer



Connor Kiselchuk
Lead of Science Operations



Janel Herbert
Communications and Operations Officer



Mohamed Mbarouk
Business Development and Strategy



Kevin Joseph
Intern

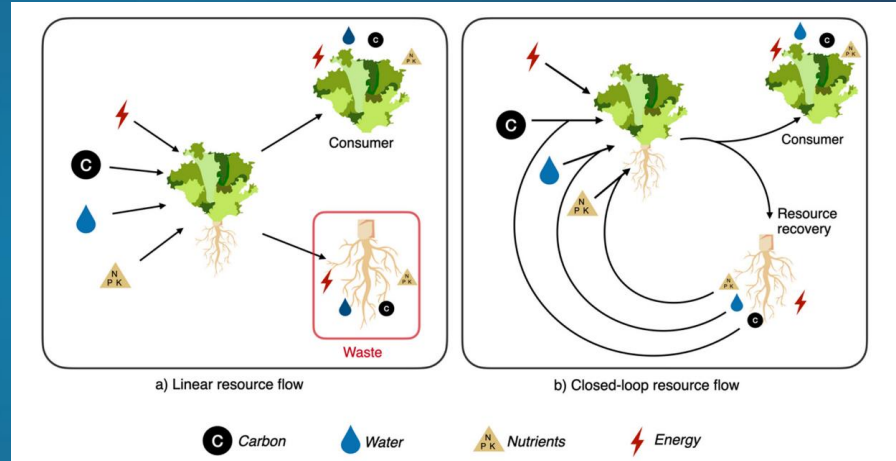
Moving forward: StarLab Oasis will actively be recruiting from a diverse pool of applications, with special emphasis on MEASA region

Support from Private US Space Industry

- Parent company **Voyager Space** is a global leader in space exploration
 - Assembling expertise in propulsion, satellite servicing and space R&D
- Sister company **Nanoracks** is a space services and hardware specialist
 - Enables commercial access to LEO
 - Sent 1300+ missions to the ISS
 - Owns and operates the most proprietary hardware on the ISS



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Waste Reutilisation	Reusing resources puts less strain on procuring new inputs, decreasing impact on climate	No garbage can in space	Every Vertical Farm on Earth could immediately adopt this technology





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Pharma, Polymers, Chemicals	Pioneer the production of useful compounds in space by utilizing specialized plants and microorganisms	With the ability to grow (more efficiently) in space, decreases the need for resupply missions	Produce a large variety of biologicals for human consumption, medical therapy, and completing day-to-day activities



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Automation	Integration of water conservation, energy saving and integration of AI to optimise processes and decrease carbon footprint	Allows for crew time to be spent in other tasks – the most crucial asset in space	Commercialisation across vertical farms (hyperspectral imaging, lighting, growth media, robotics, water delivery, etc.)

UAE

وكالة الإمارات للفضاء
UAE SPACE AGENCY



مركز محمد بن راشد
للفضاء
MOHAMMED BIN RASHID SPACE CENTRE

هيئة أبوظبي للزراعة والسلامة الغذائية
ABU DHABI AGRICULTURE AND FOOD
SAFETY AUTHORITY

مكتب أبوظبي للاستثمار
ABU DHABI INVESTMENT OFFICE

جامعة الإمارات العربية المتحدة
United Arab Emirates University
UAEU

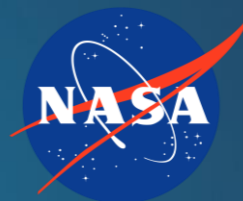
مزرعة الغد
ICBA
AGRICULTURE FOR TOMORROW

THE
-WASTE-
LAB

ASPIRE

جامعة نيويورك أبوظبي
NYU | ABU DHABI

International



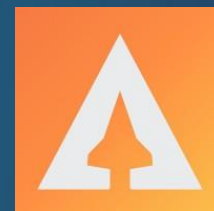
THE OHIO STATE
UNIVERSITY



PURDUE
UNIVERSITY

Nanoracks

WINSTON-SALEM
STATE UNIVERSITY



TUSKEGEE
UNIVERSITY





StarLab Oasis Commercial Space Ag-Tech Research Centre

StarLab Oasis will open and operate a unique facility in Abu Dhabi that serves as a valuable asset to the nation's agricultural interests on Earth and in Space

- **Vertically-Integrated Services**

- Scientific payload development for customers
- Scientific payload manufacturing and processing before launch
- Post-flight scientific analysis of returned samples
 - Plant Growth + Phytochemistry, Incubation, Fermentation, etc.

- **Rapid Prototyping new Ag-Tech for Earth-use (i.e., Vertical Farms)**

- Optimization of food production practices (waste reutilization)

- **The First-of-its-Kind Facility in the UAE**

- Private and Public utilization to expand domestic plant science programs



The 21st Century Arena for:

- Novel Crop Breeding Techniques
- Space-based Plant Growth Research
- Off-Earth Food Production Developments

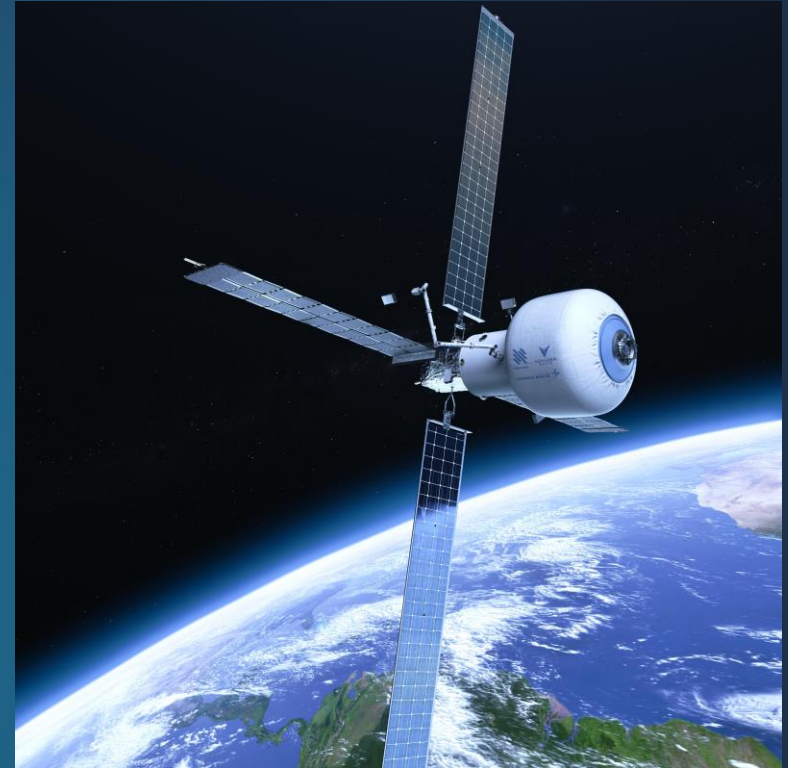


StarLab Oasis Mission Control

- Centre for research analysis and astronaut interaction
- Coordinate space-based payloads and interact with international partners



- **StarLab Oasis** dealt with the design and final proposal for Ag-related activities
- StarLab Oasis will have direct access to partner in the agricultural activities (commercial, research, etc) to take place on the space station
- With revenue stemming from NASA and non-NASA astronauts and payloads, Starlab Space Station is expected to reach orbit in 2027



PARTNERS

IN COOPERATION WITH



MELISSA



MICRO-ECOLOGICAL
LIFE SUPPORT SYSTEM
ALTERNATIVE



STARLAB OASIS

THANK YOU.

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