



REDWIRE

Building the Future: Pioneering Space Infrastructure

ASA 2024 Annual Meeting and
State Aerospace Policy Summit

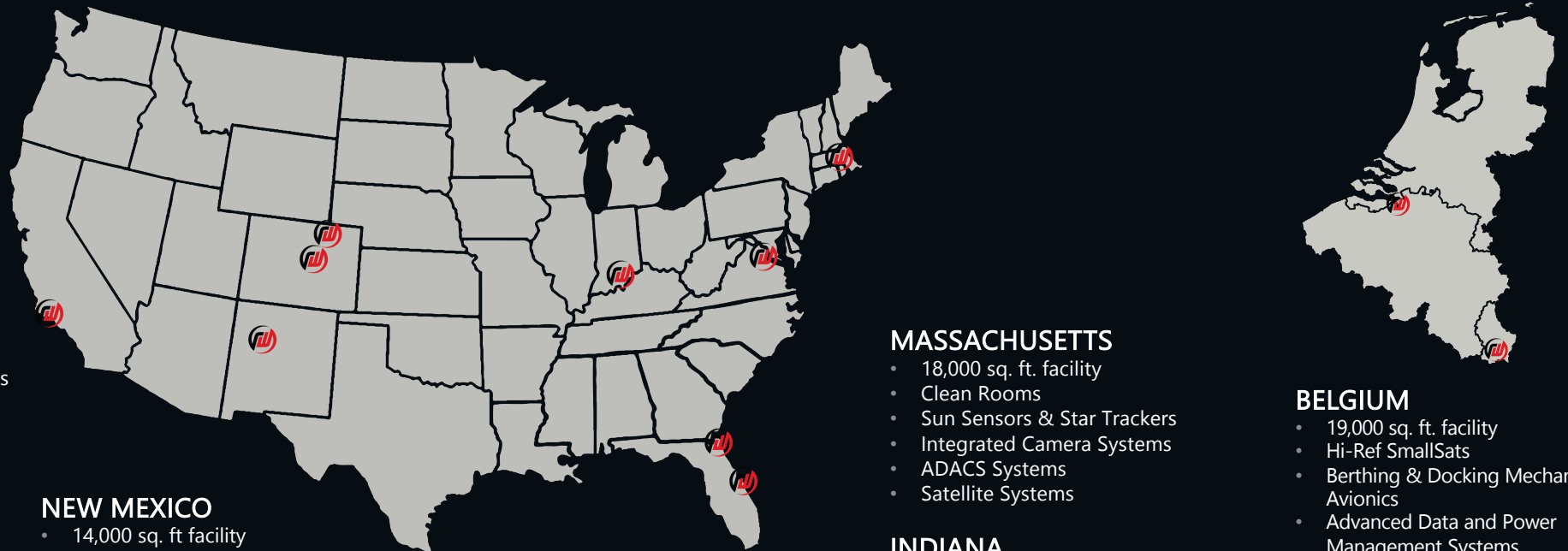
Mike Gold, Chief Growth Officer

June 27, 2024

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Over 700 Employees Working at 14 Locations in U.S. and Europe

Redwire Space Provides 60+ Years of Space Flight Heritage and Innovative Capabilities for Civil Space and National Security Missions



COLORADO (Littleton and Longmont)

- 102,000 sq. ft total in CO
- Clean Rooms
- RF & Antenna Systems
- Deployable and Retractable Space Structures
- Solar Arrays, Thermal Products
- Space Systems Engineering Services
- Camera Systems
- Flight Avionics
- Data Recovery Systems
- In-House Testing Capabilities
- Digital Engineering
- Modeling & Simulation

CALIFORNIA

- Serving all Markets
- 80,000 sq. ft facility
- 2-Story & 3-Story High Bays
- Rigid Arrays
- ROSA and other Flexible Arrays
- Retractable Solar Arrays
- Constellation Arrays
- Deployables

NEW MEXICO

- 14,000 sq. ft facility
- Operate and Maintain AFRL testing facility
- Design and Analysis Services
- Structural & Thermal Testing
- Launch Accommodation Hardware
- Thermal Control Hardware
- Deployable Technologies

FLORIDA

Redwire Corporate Headquarters in Jacksonville

- 37,247 sq. ft facility
- Clean rooms
- Advanced In-Space Manufacturing Technology
- In-Space Robotic Assembly & Manufacturing/ISAM

Merritt Island, FL (near KSC)

- 2,377 sq. ft. facility
- Strong partnership with NASA KSC
- Prelaunch processing laboratory and support
- In-space plant biology research
- ISS and lunar Payload Development

MASSACHUSETTS

- 18,000 sq. ft. facility
- Clean Rooms
- Sun Sensors & Star Trackers
- Integrated Camera Systems
- ADACS Systems
- Satellite Systems

INDIANA

- 22,000 sq. ft facility
- In-space Research
- ISS/LEO Payload Development
- Advanced Space Manufacturing Technology
- Biotechnology, bioprinting, on-orbit manufacturing, environmental control & life support systems

DC/VA/MD

- 8,000 sq. ft. facility (2/3 SCIF)
- SCIF, Classified Systems Access
- Digital Engineering Lab
- Engaging NASA GSFC in MD

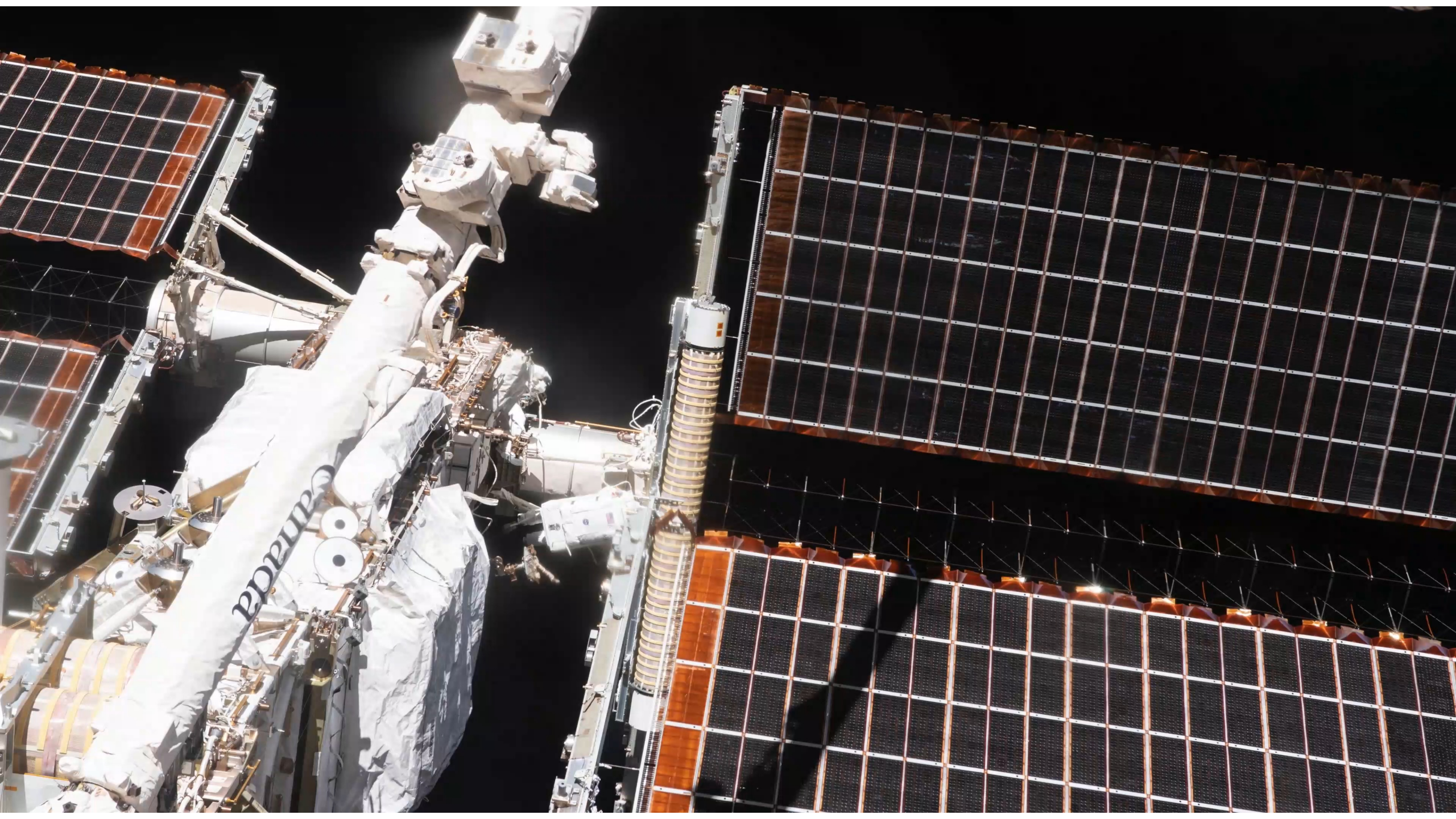
BELGIUM

- 19,000 sq. ft. facility
- Hi-Ref SmallSats
- Berthing & Docking Mechanisms, Avionics
- Advanced Data and Power Management Systems
- Life Support Systems

LUXEMBOURG

- 2,500 sq. ft facility
- Redwire Engineering & Sales Center in Europe
- Robotic Systems
- Avionics

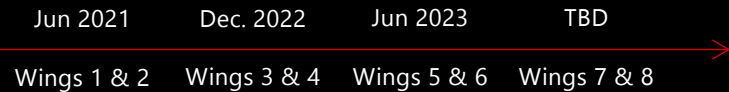




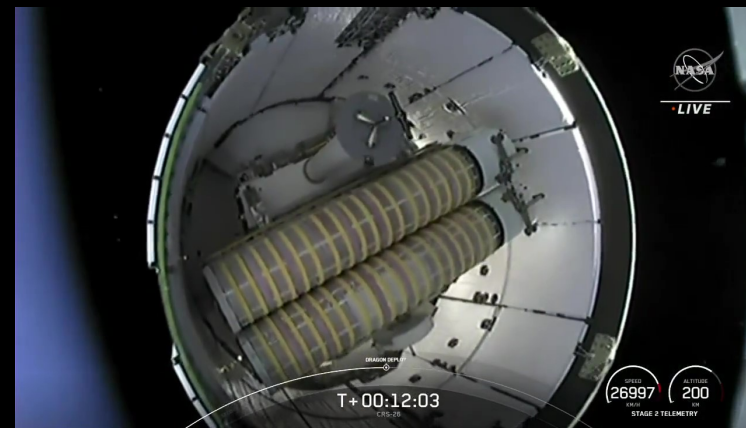
Canada

Redwire's Roll-Out Solar Arrays (ROSAs)

Redwire has delivered six 28kW iROSA wings to amplify power on the International Space Station (ISS).



Redwire's two 3.5kW ROSA's powered the entire spacecraft for NASA's Double Asteroid Redirection Test (DART) mission, the world's first planetary defense test mission that impacted an asteroid on September 26, 2022.



Redwire is building the largest solar arrays ever deployed by humanity in space for Gateway's Power and Propulsion Element (PPE).



BUILD ABOVE

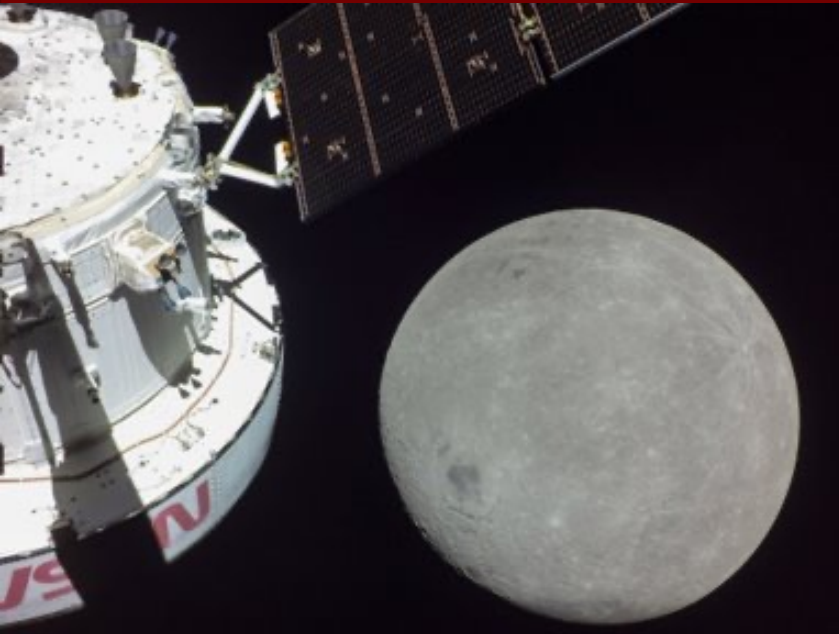
Artemis I

Kennedy Space Center (KSC),
November 16, 2022



"Eyes of Orion" for NASA's Artemis I Mission

Redwire manufactured the cameras for Orion which captured stunning imagery from the historic Artemis I mission.



Redwire Spaceflight Research and Manufacturing Equipment

3DP
First 3D Printer in
Space (2014)



Bone Densitometer
DXA Scanner (2014)



AMF
Additive Manufacturing
Facility (2016)



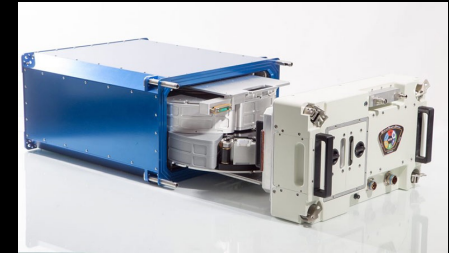
ADSEP
Advanced Space
Experiment Processor
(2017)



Fiber
Commercial Fiber Optics
Manufacturing (2017)



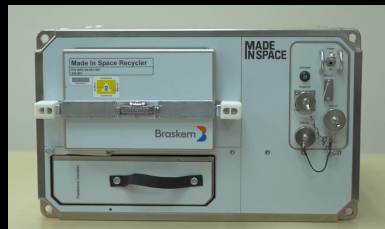
MVP
Multi-use Variable-
gravity Platform (2018)



BFF
3D Biofabrication
Facility (2019)



Recycler
Recycling of Plastic
Materials (2019)



TSCM/TCMM
Turbines
(2020)



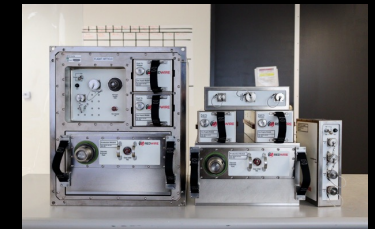
ICF
Industrial Crystal
Facility (2021)



ADSEP2
Advanced Space
Experiment
Processor2 (2021)



MSTIC
Manufacturing of Semiconductors
and Thin-Film Integrated
Coatings (2024)



Redwire has developed 20 payloads for human-tended spaceflight, and currently has ten onboard ISS.

20x Speed



BioFabrication Facility installation (BFF)

First Human Knee Meniscus Construct Bioprinted In Space!

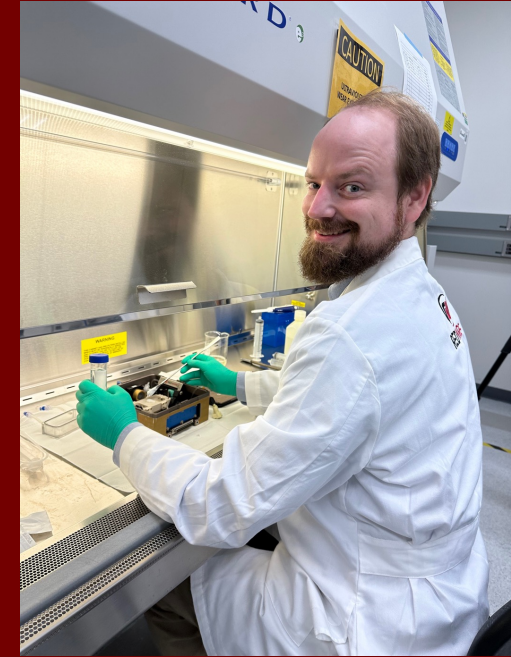
UAE Astronaut among those helping conduct the experiment



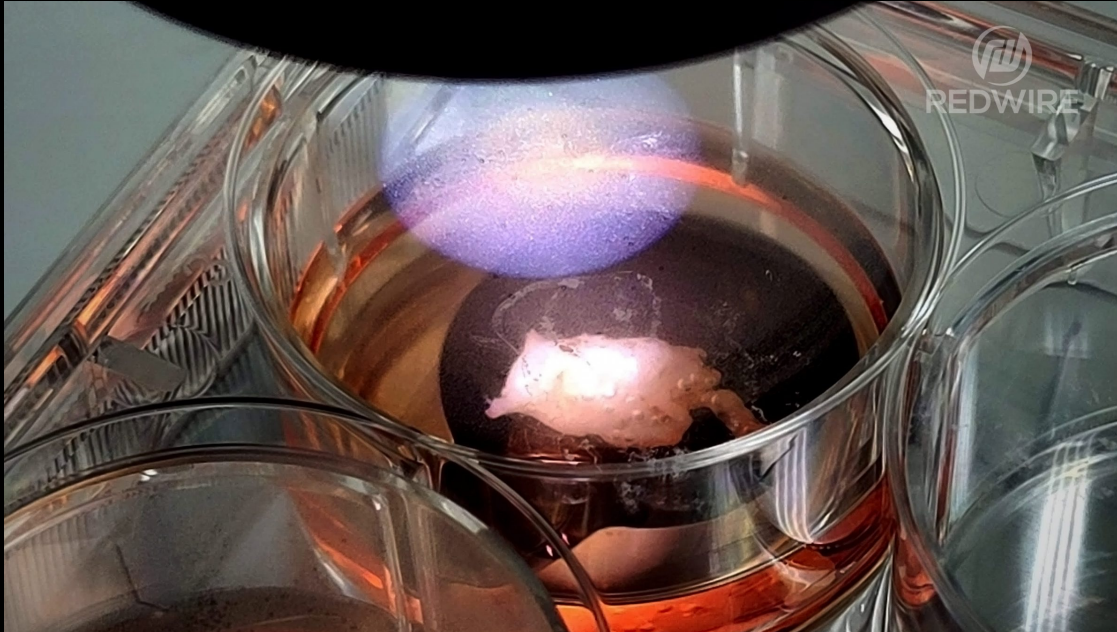
In-space 3D bioprinted human knee meniscus material



Very happy Redwire Senior Scientist
Dr. Aaron Rogers



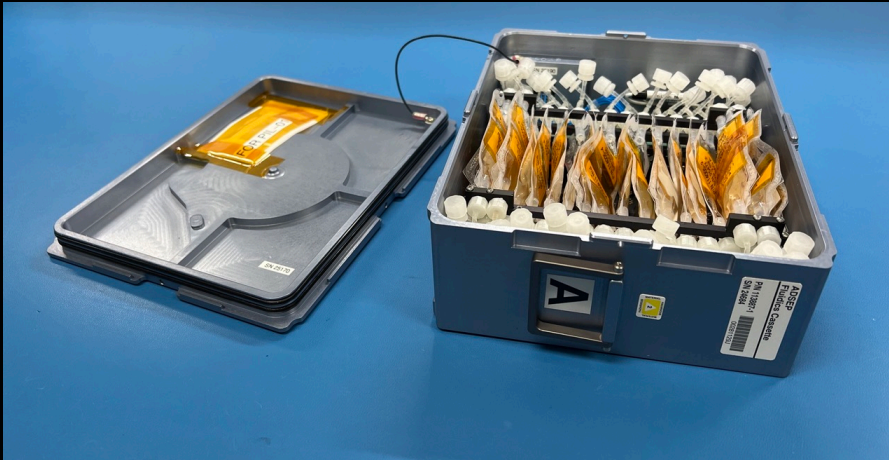
Live Human Heart Tissue Bioprinted in Space!



Live human heart tissue bioprinted with Redwire's BioFabrication Facility onboard the International Space Station. The tissue successfully returned to Earth in April 2024.

- First live human heart tissue sample printed using 3D BioFabrication Facility (BFF) onboard the International Space Station (ISS).
- Live human heart tissue bioprinted on Redwire's BFF could eventually be used to create heart patches as a treatment for damaged heart tissue, opening the door to more effective, personalized medicine.
- The tissue sample is now undergoing further testing at Redwire's facility in Greenville, Indiana. On the next BFF mission, Redwire plans to 3D bioprint human blood vessels in space.

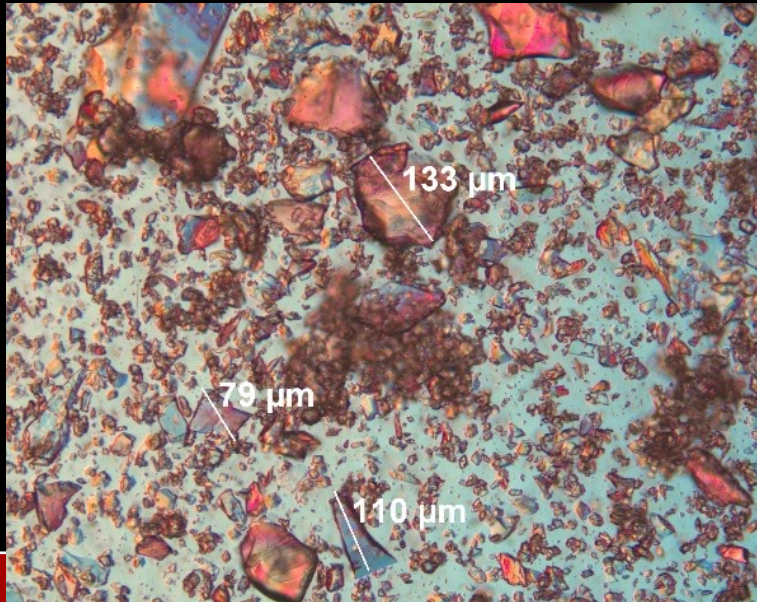
Pharmaceutical In-space Laboratory (PIL) - Bio-crystal Optimization eXperiment (BOX) cassette



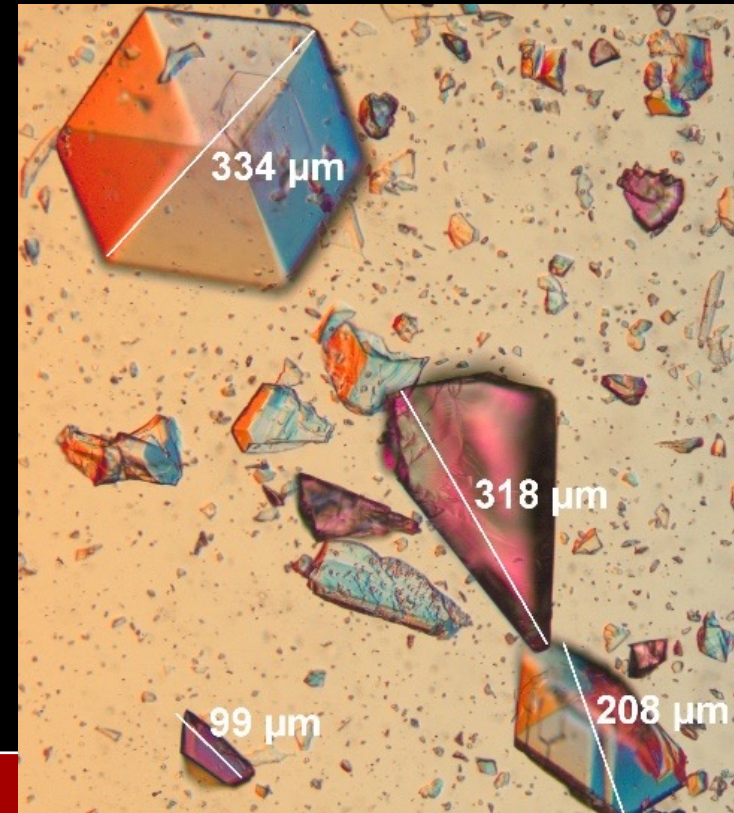
Left, one of three varieties of PIL-BOXes for drug research and manufacturing. Right, NASA Astronaut Loral O'Hara on the ISS with a PIL-BOX Fluidics Cassette

- Applications include formulating new drug crystal morphologies, growing crystals that are difficult to grow terrestrially, growing seed crystals, and growing crystals for structure determination
- PIL-BOX applications include the pharmaceutical, agricultural, cosmetic, and food industry
- Small and large molecule crystallization is possible, including formulation and reformulation

Case Study: Insulin



A



B

Figure 1: PLM images of Insulin crystallized on Earth (A) and on the International Space Station (B). Both images were collected with 10X magnification.

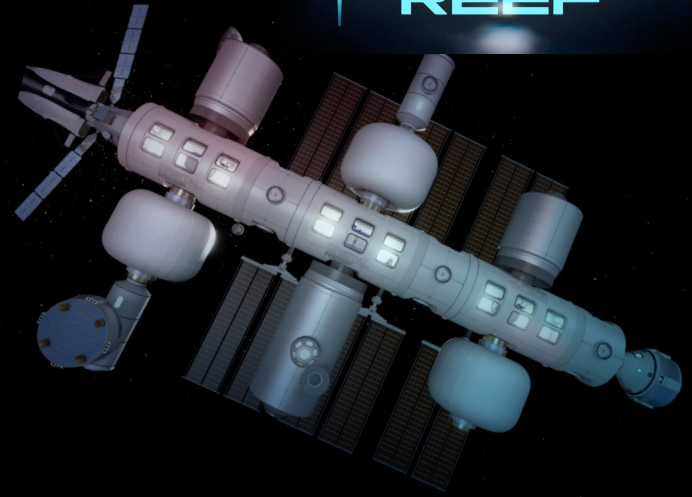
Nourishment: Growing Plants in Space



Advanced Plant Habitat (APH) is the most complex greenhouse ever flown in space



Commercial Destinations in Low Earth Orbit (CLDs)



Outer Space Treaty of 1967

ARTICLE VI

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. *The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.* When activities are carried on in outer space, including the moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

Outer Space Treaty – Article VI

State parties are responsible for all national activities, whether government or non-government



Mission Authorization

- Regulatory certainty can best support innovation within the commercial space industry and maintain U.S. leadership in the space sector.
- The United States should establish a transparent, efficient, and effective mission authorization structure to comply with the Outer Space Treaty's Article VI obligations for "authorization and continuing supervision" for activities that fall outside of the existing regulatory approval structure for commercial space activity, e.g. FAA – launch and reentry; FCC – spectrum utilization, debris mitigation and remediation; NOAA – remote sensing.

Recommendations:

- Single Agency (U.S. Department of Commerce)
- Robust Transparency
- Hard Deadlines
- Presumption of Approval
- Self-certification
- Limitation of considerations to specific legal obligations