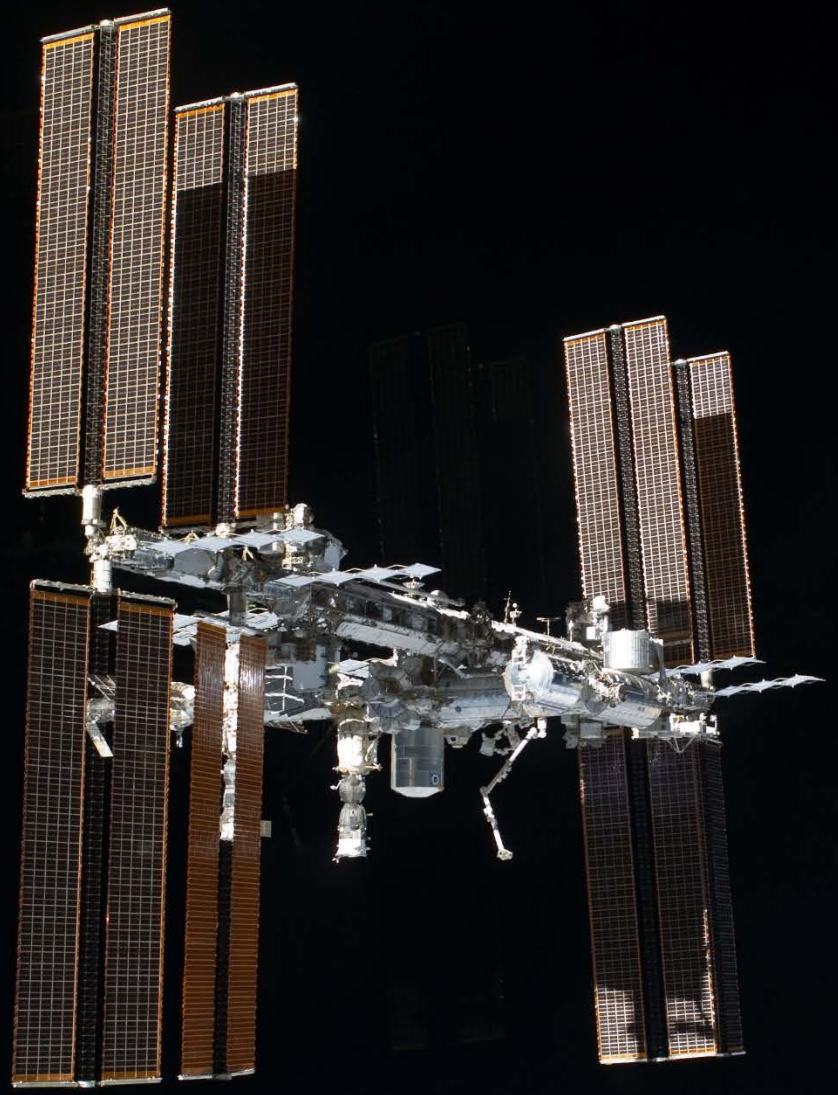


ISS U.S. NATIONAL LABORATORY

TECHNOLOGY IN SPACE PRIZE OVERVIEW

Rachel Clemens, Ph.D.,
Commercial Innovation Manager

Etop Esen, Ph.D.,
Commercial Innovation Manager

June 2021

CENTER FOR THE ADVANCEMENT OF SCIENCE IN SPACE (CASIS)

The International Space Station (ISS) U.S. National Laboratory is managed by CASIS, a not-for-profit non-governmental organization, via a Cooperative Agreement with NASA.

MANAGING THE ISS NATIONAL LAB

Work in partnership with NASA, Commercial Service Providers, and Implementation Partners

Draw on ISS National Lab science to improve the lives of people on Earth and provide value to the nation

Create new partnerships across disciplines and industries

TECHNOLOGY IN SPACE PRIZE

PAST AWARDS

2019
Axonis Therapeutics
Encapsulate LLC

2018
Kernal Biologics, Inc.
MicroQuin

2017
Cellino Biotech, Inc.
Guardian Technologies
MakerHealth

2016
Angiex, Inc.
Dover Lifesciences
LambdaVision, Inc.

MASSCHALLENGE

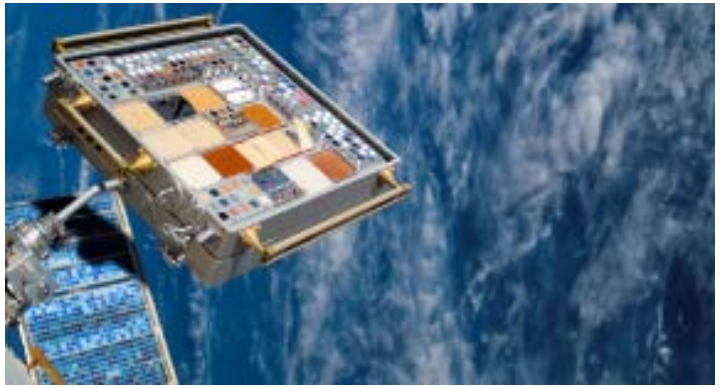
BOEING

WHY SPACE?

Persistent Microgravity

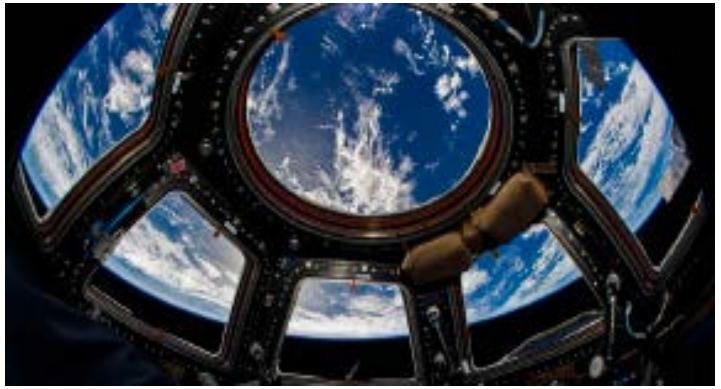
Lack of density gradients
No convection
Uniform surface wetting
Multiphase flow dynamics
Reduced interfacial tension
Accelerated disease models

Extreme Conditions

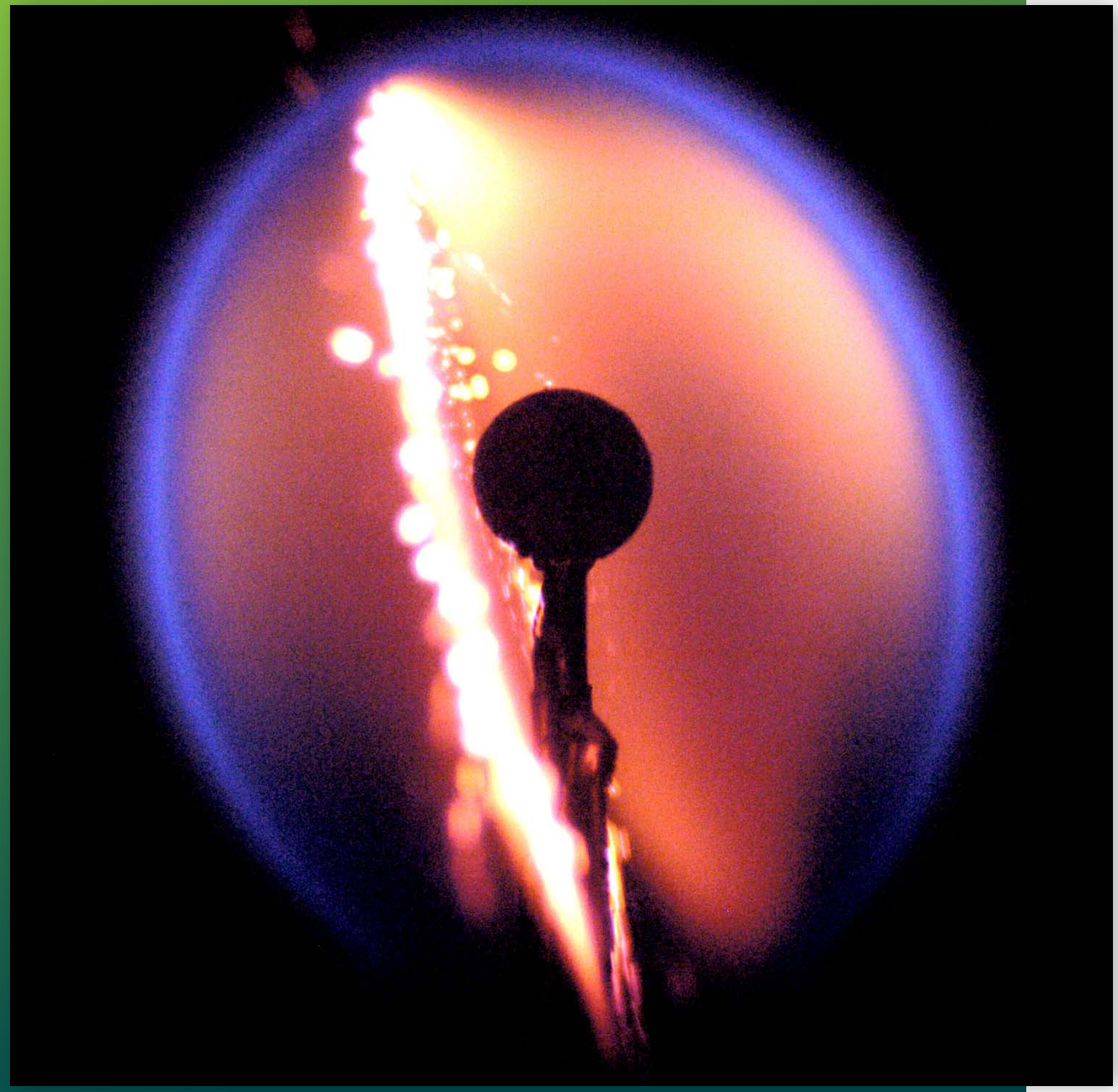


500°F orbital heat cycling
Ultrahigh vacuum
High-energy radiation
Atomic oxygen
High-energy impact

Unique Vantage Point



250 miles above Earth
Orbital path: 90% of population
Spatial resolution
Sun cycling/light conditions
Remote sensing
Satellite deployment



MICROGRAVITY

AXONIS (2019)

Will test therapeutic to treat spinal cord injuries on 3D brain organoids in microgravity

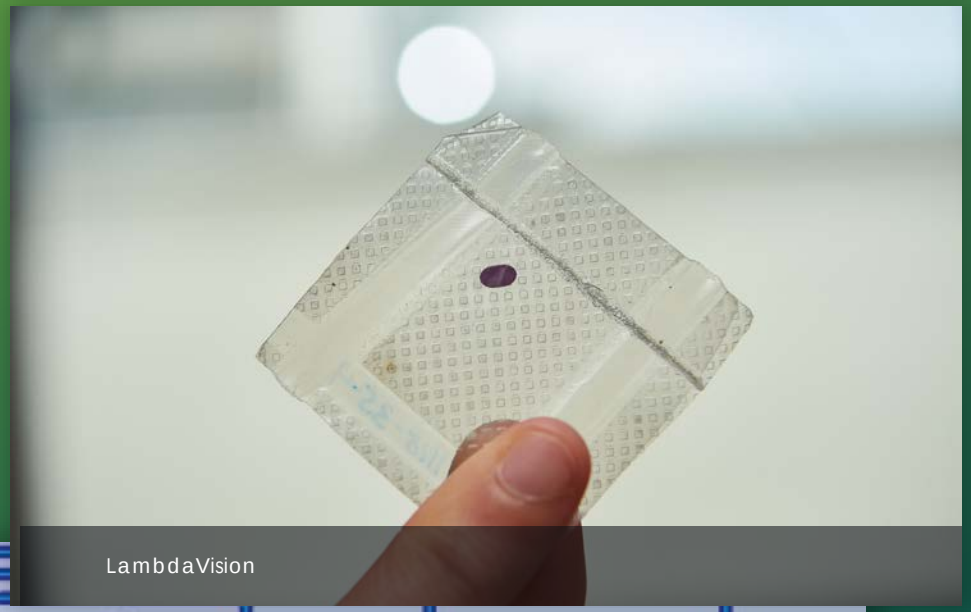
Team recently closed a $4M round of funding

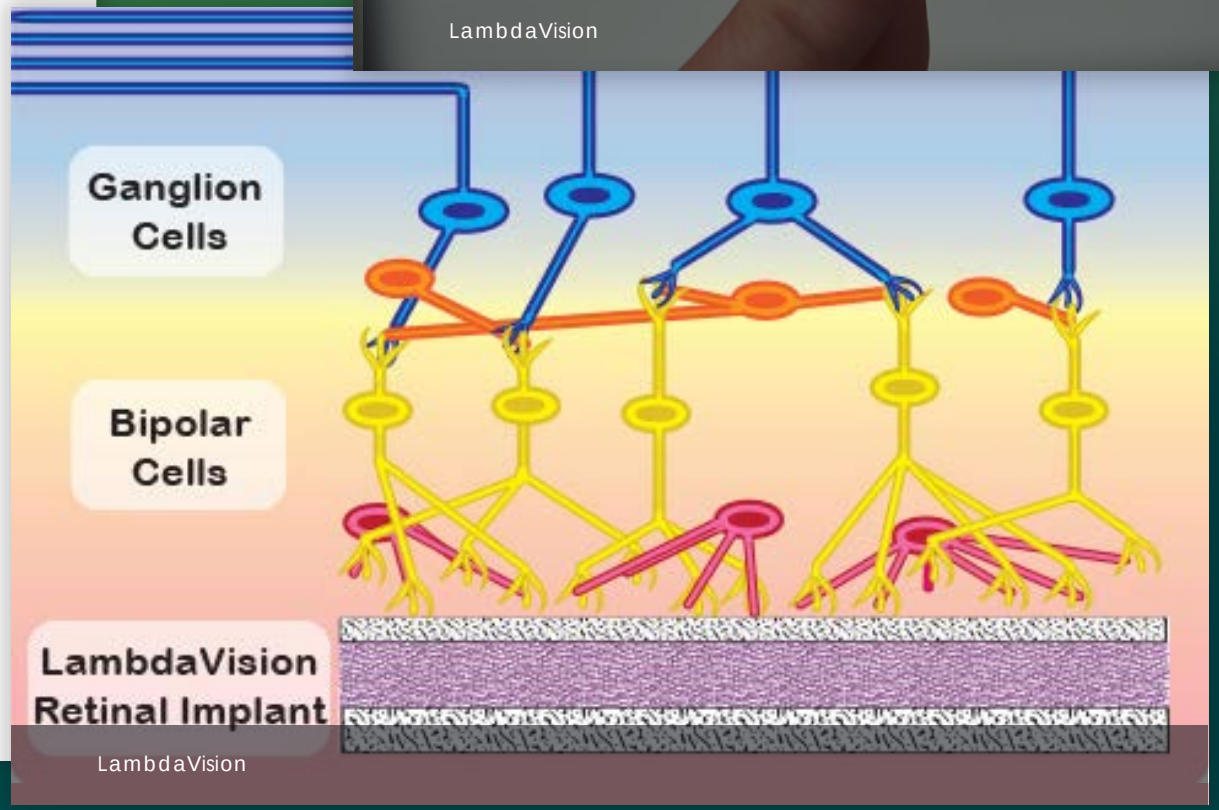
LAMBDAVISION (2016)

Protein-based implant with a bacteriorhodopsin photoreceptor

Lower convection-induced mixing in microgravity during deposition

Awarded $5M by NASA to further explore manufacturing the implant in space





EXTREME CONDITIONS

The extreme environment of space includes exposure to extreme heat and cold cycling, ultrahigh vacuum, atomic oxygen, high-energy radiation, and debris impact.

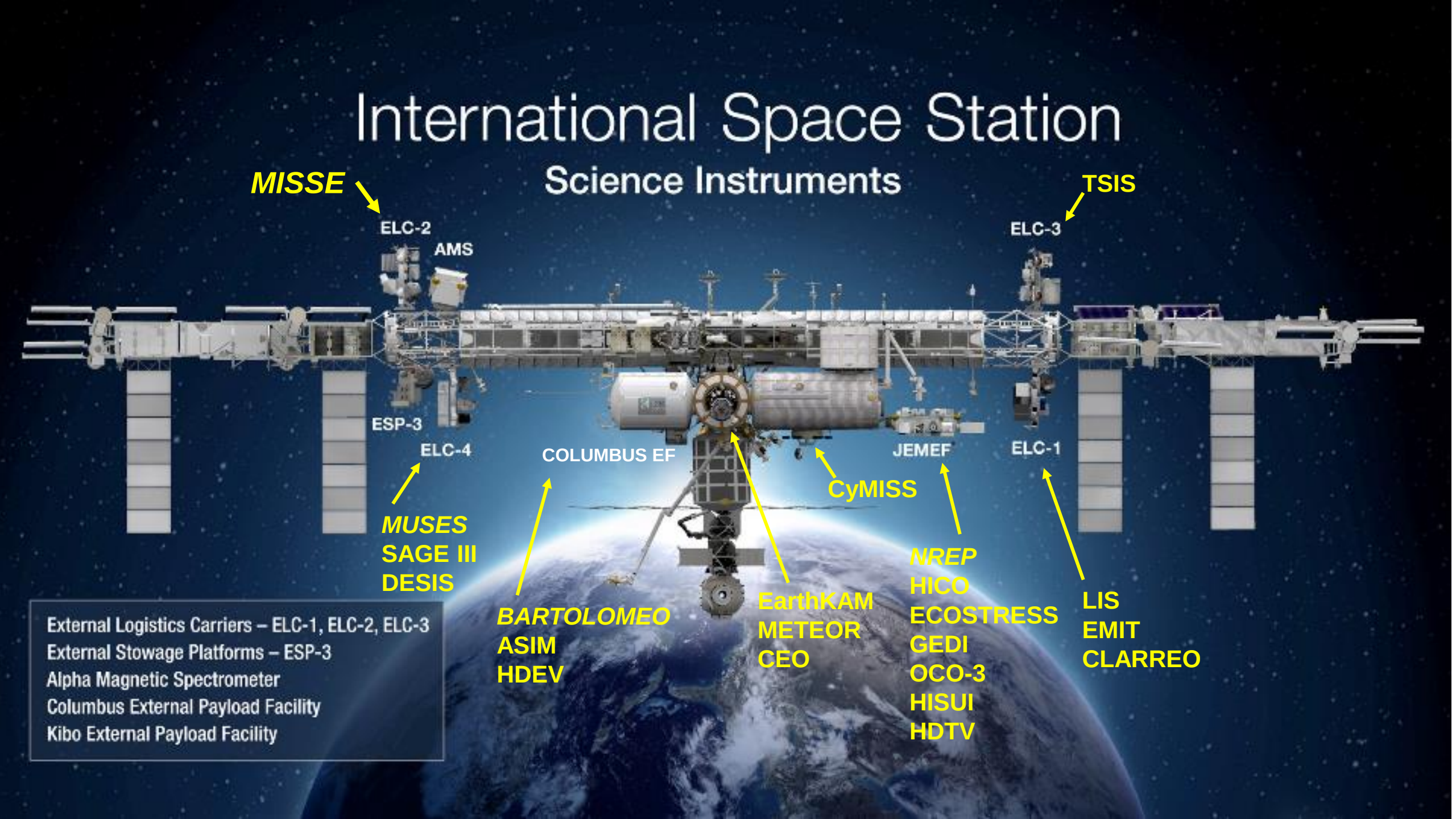
RAS LABS (2013)

Assessed cumulative radiation exposure effects on Synthetic Muscle™

Received venture capital and grant funds after winning a Technology in Space Prize

UNIQUE VANTAGE POINT

The ISS is approximately 250 miles above Earth and provides a wide range of Earth-viewing resolutions and geometries.


International Space Station
Science Instruments
MISSE
TSIS
ELC-2
AMS
ELC-3
ESP-3
ELC-4
COLUMBUS EF
JEMEF
ELC-1
CyMISS
MUSES
SAGE III
DESIS
BARTOLOMEO
ASIM
HDEV
EarthKAM
METEOR
CEO
NREP
HICO
ECOSTRESS
GEDI
OCO-3
HISUI
HDTV
LIS
EMIT
CLARREO
External Logistics Carriers – ELC-1, ELC-2, ELC-3
External Stowage Platforms – ESP-3
Alpha Magnetic Spectrometer
Columbus External Payload Facility
Kibo External Payload Facility

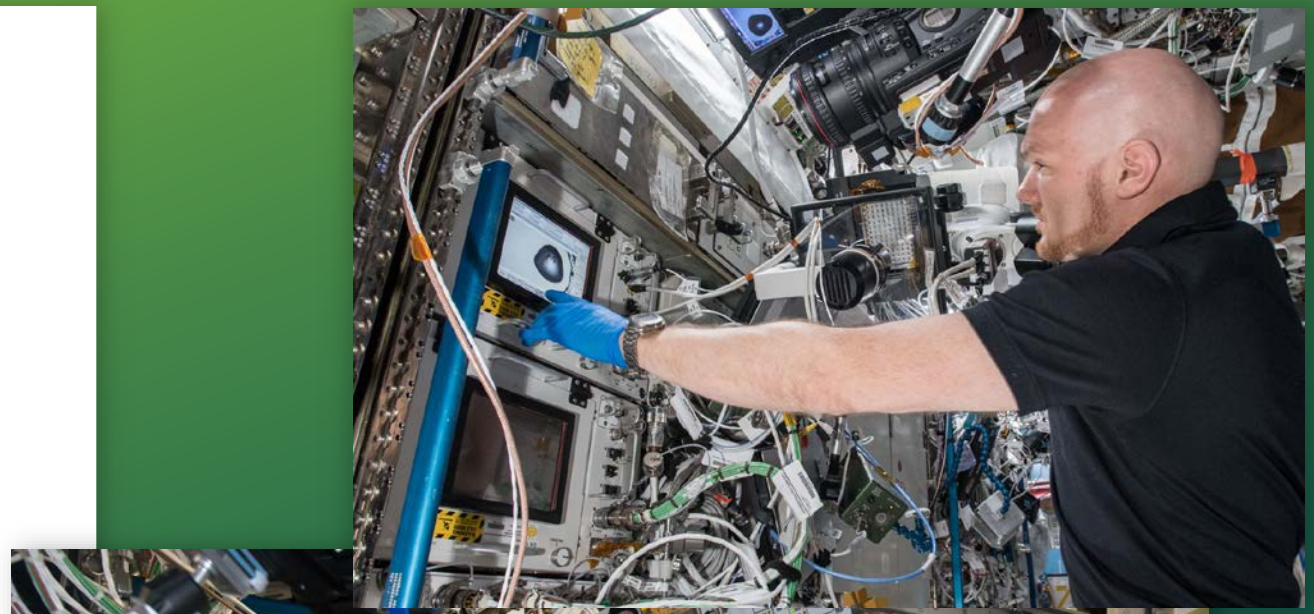
FLIGHT HARDWARE AND R&D FACILITIES

The ISS features multipurpose facilities for life and physical sciences research as well as hardware dedicated to perform standard laboratory procedures.

For additional information, please see:

ISS Researcher Guide Series

Space Station Research Explorer



PROJECT COLLABORATION & SUPPORT

Implementation Partners work with the ISS National Lab and researchers to:

- Translate projects for ISS hardware and facilities run by Commercial Service Providers
- Design hardware components
- Aid in the execution of projects on station

38 Implementation Partners

17 Commercial facilities run by 10 Commercial Service Providers

For additional information, please see the [Implementation Partner Database]

TECHNOLOGY IN SPACE PRIZE INFORMATION

- ***Funding:*** Contingent upon availability, total funding for the 2021 Technology in Space Prize is $500K.
- ***Awards may be funded or unfunded:*** Awards, if any, will receive sponsorship of ISS National Lab resource utilization, payload launch to the ISS, in-orbit ISS crew time, data return, and payload return, if required.
- ***Period of Performance:*** It is anticipated that the period of performance will be no longer than three (3) years from date of award.

PROJECTS MUST CLEARLY LEVERAGE SPACE

We are looking for:

Proof-of-concept or technology maturation projects

Projects that accelerate business or manufacturing timelines

Physical and life sciences projects

But not:

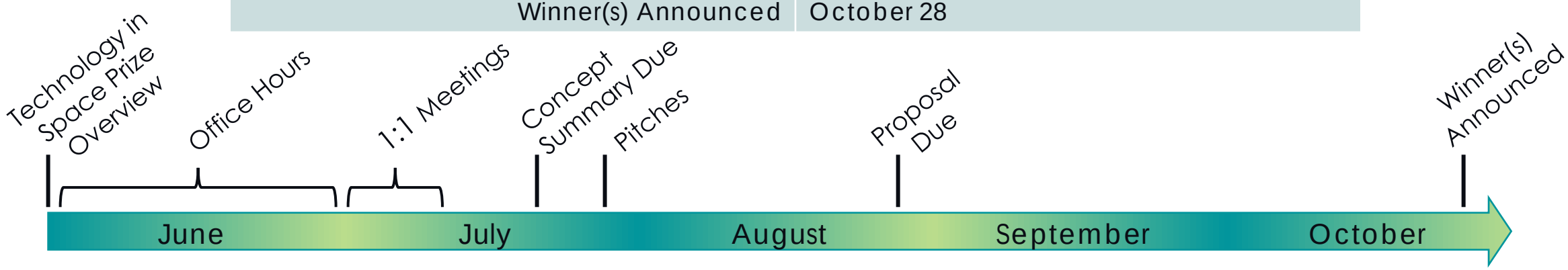
Device or therapeutics testing on astronauts

Demonstrations solely used for branding or public relations

TECHNOLOGY IN SPACE PRIZE TIMELINE*

Event	Date
Provide Technology in Space Prize resources to startups	February-June
Technology in Space Prize Overview Presentation	June
Office Hours	June
1:1 Meetings	Early July (July 6-9)
Concept Summary Due	End of July
Selected Startups Pitch	End of July
Draft Proposal Due	Mid-August
Full Proposal Due	End of August
Winner(s) Announced	October 28

*Subject to modification



THANK YOU

Discover the unique advantages of conducting research in microgravity onboard the ISS National Lab.

ISS
U.S. NATIONAL LABORATORY

Uluru, or Ayers Rock, a massive sandstone monolith in the heart of Australia's Northern Territory's arid "Red Centre" as seen from the ISS.

- **www.ISSNationalLab.org**
- **https://projects.ISSNationalLab.org**
- **www.ISSNationalLab.org/stem**

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