



ARCHINAUT ONE

Technology Demonstration Mission Status Update

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What is Archinaut?

A Class of On-Orbit Servicing, Assembly, and Manufacturing (OSAM) Capabilities

- *In Space Manufacturing*
- *Robotic Assembly*
- *In-Situ Verification*

What is Archinaut One?

Technology Demonstration Mission: OSAM-2

- *First Self-Manufacturing Satellite*
- *Additively Manufactured (AM) Solar Array Structures*



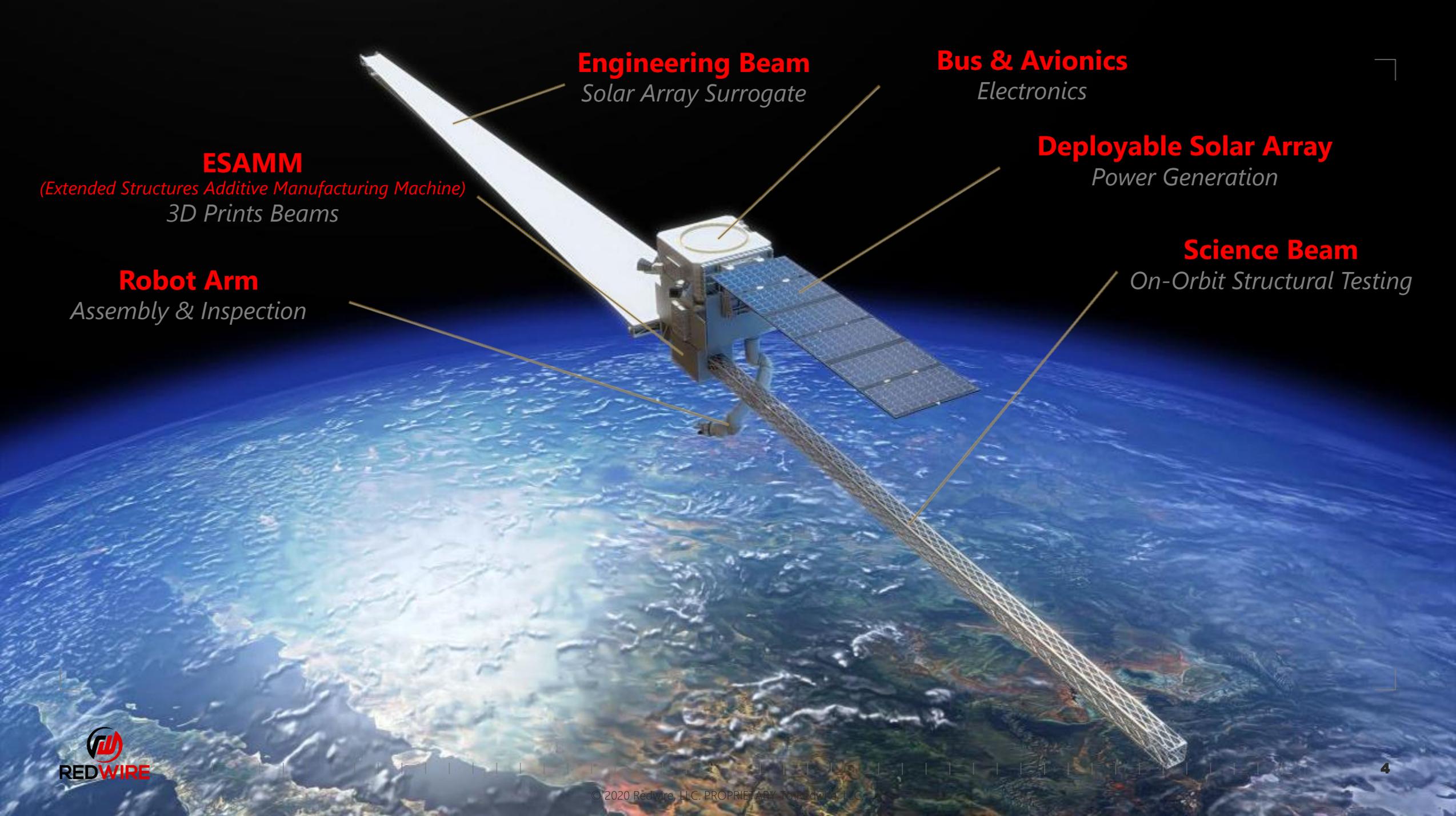
Why is Archinaut Tech Useful?

- *Reduces Mass*
- *Mitigates Volume Constraints*
- *Design Flexibility*
- *Cost Feasibility for Large Structures*

Why is Archinaut Significant?

- *Improved Customer Capabilities*
- *Proof of OSAM Feasibility*
- *Enabling Technology Extensibility*





Engineering Beam
Solar Array Surrogate

Bus & Avionics
Electronics

Deployable Solar Array
Power Generation

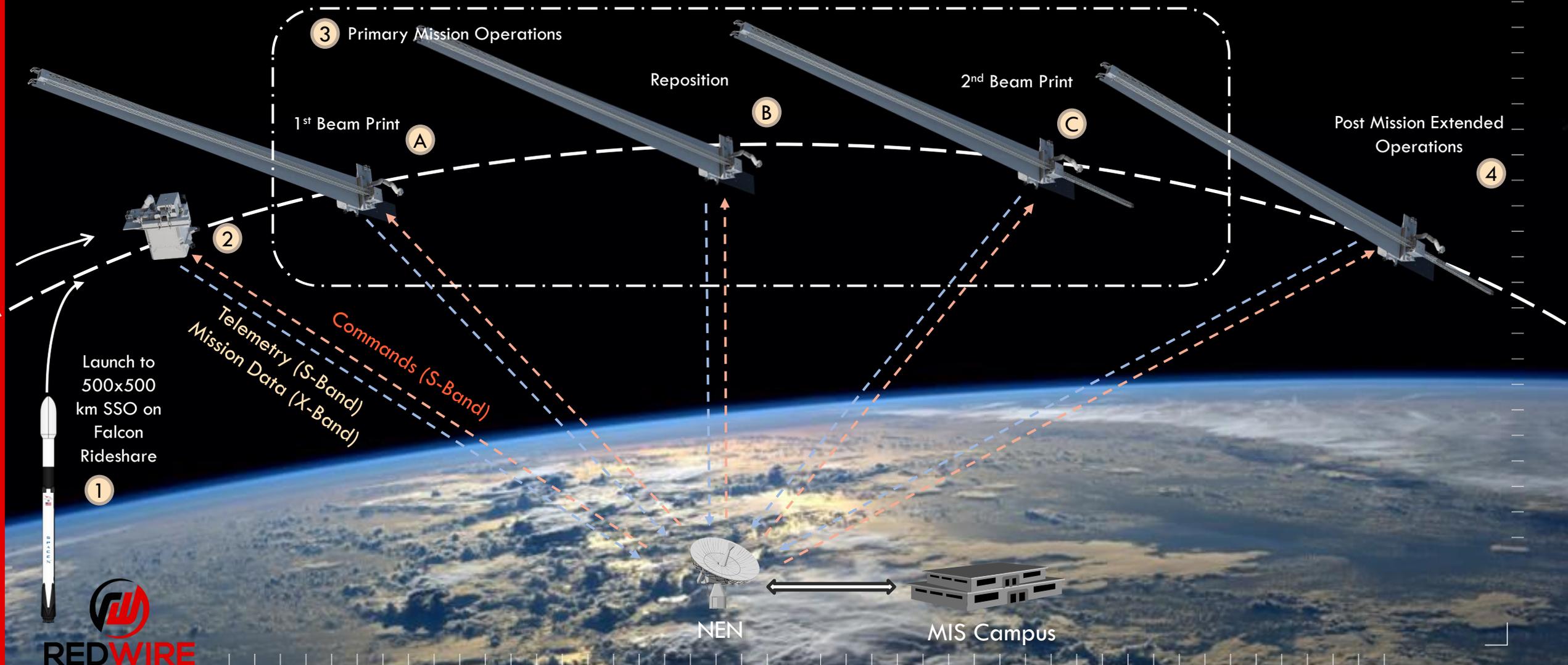
Science Beam
On-Orbit Structural Testing

ESAMM
(Extended Structures Additive Manufacturing Machine)
3D Prints Beams

Robot Arm
Assembly & Inspection



Operational Overview





Technology Development Strategy

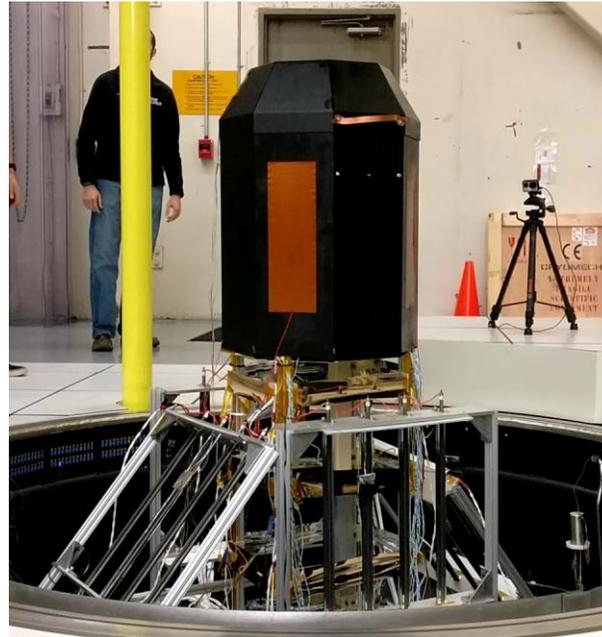
ISS Payloads

Micro-G AM: 3DP & AMF



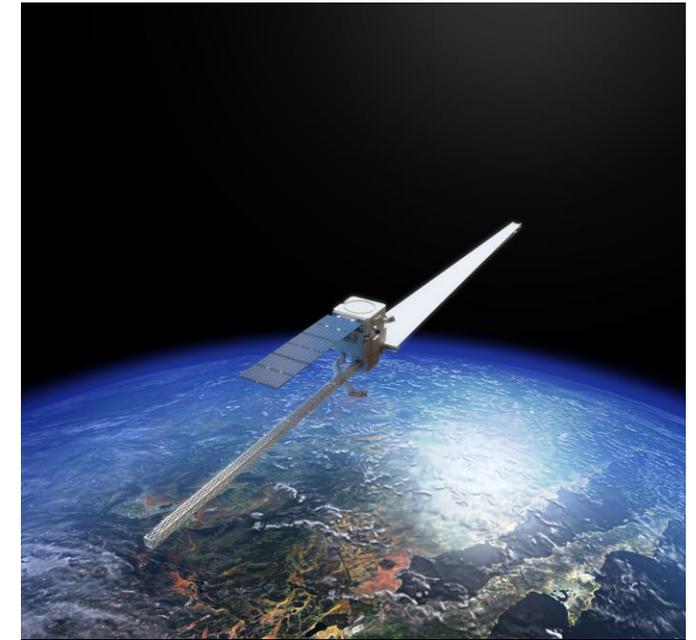
Technology Evolution

Archinaut Phase 1



Freeflyer Mission

Archinaut One (Phase 2)



Archinaut Development History (Pre-Archinaut)



2010 – 2014

3DP Development

Development & Testing of Microgravity AM Technology

MIS and NASA MSFC remotely operate the 3D Print payload to build the first parts ever made off-Earth



2012 – 2015

AMF Development

Implementation of lessons learned from 3DP in the commercial Additive Manufacturing Facility

AMF delivers rapid hardware solutions to the ISS

Archinaut Development History (Phase 1)



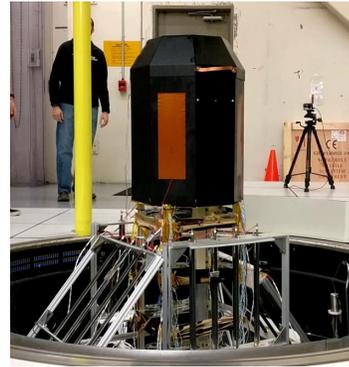
2016

**Archinaut (Phase 1)
Awarded**

Early ESAMM Development

Ulysses: Truss Assembly
Design Reference Mission

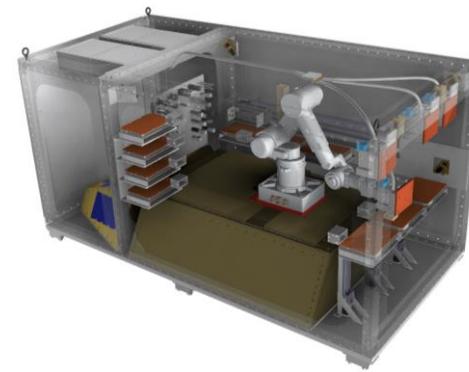
Beam Printing & Robotic Assembly



2017

World Record Beam
Early ESAMM Version

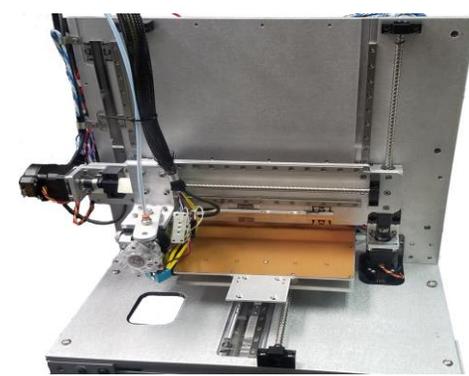
ESAMM TVAC
Phase 1 ESAMM EDU



2018

GBMASH
Ground-Based Manufacturing
and Assembly System Hardware
*Robot Arm Controls, Extrusion
Technology, Additional Tech
Development*

VacAMF
*Test Platform for In-Vacuum
Additive Manufacturing*

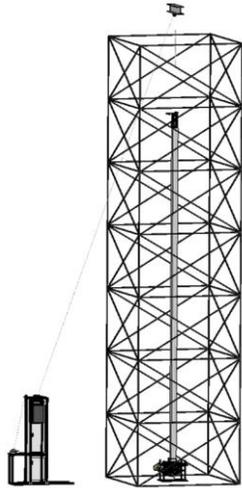


2019

**Archinaut One (Phase 2)
Awarded**

ESAMM Phase 2 EDUs
Design and Development

Archinaut Development Timeline (Phase 2)



2020

ESAMM Phase 2 EDU
Ambient Vertical Test

ESAMM Phase 2 EDU
Thermal Vacuum Testing

Archinaut One PDR

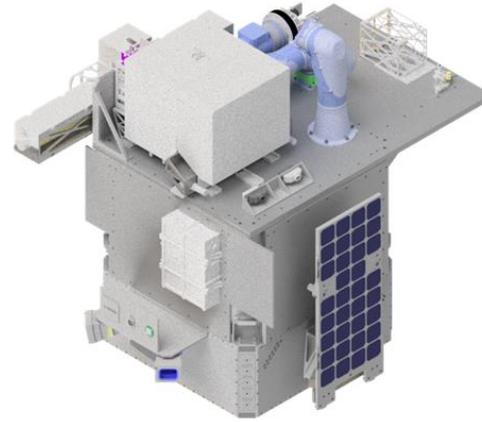


2021

ESAMM Flight Unit
Assembly & Testing

Materials Testing

Archinaut One CDR



2022

Spacecraft Integration



2023

Archinaut One Flies!

On-Orbit Operations &
Testing

Redwire Technology Ecosystem

Flown Payloads



Zero Gravity Printer
2014



AMF
2016



Fiber Optics
2017



Recycler
2019

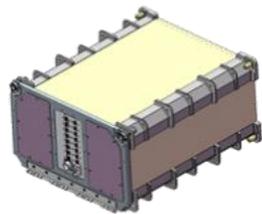


Ceramic Manufacturing
2020

In Development



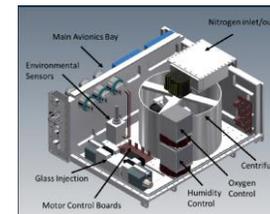
Industrial
Crystallization
Facility



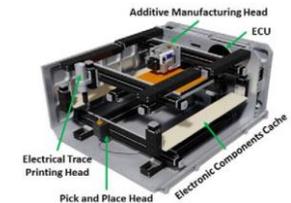
Metal Turbine
Manufacturing



Metal
Additive/Subtractive
Manufacturing



Optical Glass
Manufacturing



Electronics
Manufacturing



Archinaut – Future Applications

