Space Copy©

Advanced In-Situ Logistics and Additive Manufacturing

www.spacecopy.com

linkedin.com/company/spacecopy

About Me:

Madison C. Feehan

Founder, CEO and President

- Prior NASA/ESA Experience
- UN COPUOS Subcommittee Advisor
- Chair Of The International Lunar Chamber of Commerce
- G100 Space Technology and Aviation Chair for the Province of Alberta
- Background Education in International Business and Entrepreneurship from Harvard Business School and University of Victoria

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What If?

It’s 1969… on the final lunar frontier, Apollo 11 astronauts are about to step foot on the Moon’s surface for the first time in recorded human history.

But what if something breaks on the lander? What if an electronic control becomes unresponsive?

What do you do?

You manufacture a replacement

What is 3D Printing?

Also known as additive manufacturing (AM), 3D printing **creates three-dimensional objects from a digital file** using **feedstock**, a raw material generally composed of plastics or metals.

Implementations:

Medical, Automotive, Aerospace & Defence, Fashion

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How Does 3D Printing Work?

FDM: The Basics

- Extrusion-based technology using thermoplastic filaments
- Materials: ABS, PLA, PETG, PEI polymer filaments
- Cost-effective technology widely used across industries
- Layer-by-layer deposition creating solid 3D objects

How FDM Works

- Thermoplastic filament heated to melting point in print head
- Molten material extruded through nozzle onto build platform
- Deposition follows precise path determined by CAD model
- Material solidifies rapidly, bonding to previous layers
- Platform lowers for each new layer (0.1-0.3mm thickness typical)

SLM: The Basics

- Powder bed fusion technology for metal parts
- Uses high-powered laser to selectively melt metal powder
- Creates fully dense, high-strength metal components
- Applications in aerospace, medical, automotive industries

How SLM Works

- Metal powder spread in thin layer across build platform
- High-power laser selectively melts powder according to CAD data
- Platform lowers incrementally (20-50 microns typical)
- New powder layer applied and process repeats
- Unmelted powder provides support during building

What Is In-Space Manufacturing (ISM)?

- In-space manufacturing is the practice of creating mission critical supplies, infrastructure, medicine, and more to support astronaut and robotic missions in orbit and on planetary surfaces outside of Earth.

- The most sustainable and scientifically compelling form of in-space manufacturing uses a process referred to as: in-situ resource utilization (ISRU), which is the practice of extracting valuable commodities from space to use as raw manufacturing feedstock.

- For construction applications on the Moon and Mars, lunar soil (regolith) is able to be extracted, processed, melted and fused together through 3D printing and additive manufacturing technology.

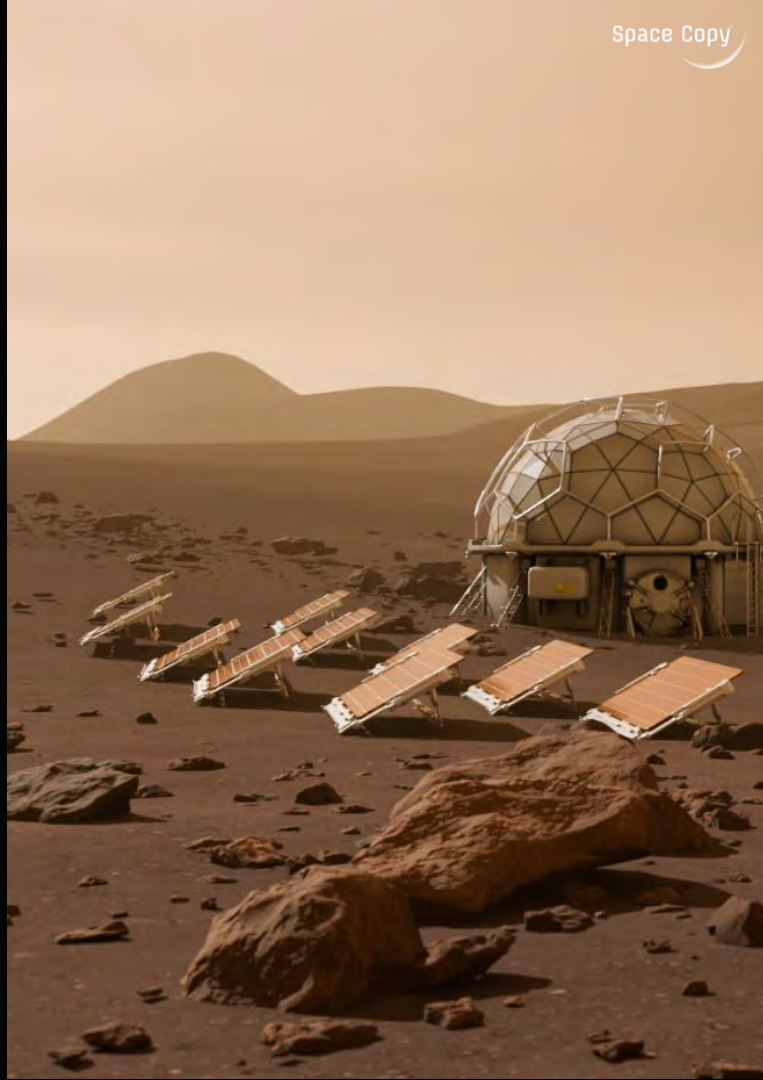
Defining The Space Economy:

- The space economy has a current value of $464B USD. This is slated to increase to $737B USD by 2031, and $1.2T USD by 2040.

- The lunar manufacturing market is currently valued at $1.5B USD. This is slated to increase to $7.5B USD per year by 2030.

- The lunar economy is recognized globally as the most fast-paced growth induced economic market since the dot com bubble.

- The next generation of spaceflight can only be safely conducted if in-space manufacturing is widely developed and utilized. This notion is recognized by global industry leaders in space, government, academia, and industry.



MISSION

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Who We Are

Space Copy is an in-situ logistics and additive manufacturing company based in the US & Canada. We are developing novel 3D printing systems for infrastructure development in extreme environments on Earth and in-space for civil government, defense and commercial customers.

- Arctic
- Desert
- Subsea
- Microgravity
- Moon
- Deep Space
- Combat Zones
- Natural Disaster Areas
- Construction Sites

Fully Automated | Multi-Material | 70% Cheaper Than Standard Logistics

How Much Does It Cost To Send 1 Kilogram Of Supplies From Earth To The Moon?

Sending raw materials to the Moon is extremely costly, with a cost of

$1.2M USD per kg

This cost is based on actual NASA contracts, which exceeded earlier commercial estimates of $300,000 per kg.

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Solving Logistics Supply In Complex Environments

- Supplying infrastructures in remote areas is restricted by cost and weight of transportation impacting efficiency and security of operations.
- It costs on average ~$1.2 million / kg* to send a payload to the lunar surface.
- Approximately 21,773 kg of supplies are needed to sustain a crew of four for one year

Moon


Underwater


Arctic

Desert

Source: https://www.frontiersin.org/articles/10.3389/frspt.2020.593523/full

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Use Case: Space

“Converts lunar regolith (soil) and recycled metals into usable infrastructure.”

Using advanced beneficiation, additive manufacturing, and autonomous robotics technologies, **Space Copy converts in-situ space resources into critical supplies**, habitats, launchpads, repair parts, precision tools, and more, **to make space operations more efficient, sustainable, and affordable**.

Use Case: Terrestrial

“Converts soil, sand and recycled metals into usable infrastructure.”

Space Copy converts terrestrial in-situ resources into critical supplies, housing, roadways, repair parts, precision tools, and more, **to make logistics operations in austere environments, combat zones, and natural disaster areas more efficient, sustainable, and affordable.**

Key Infrastructure Development

To develop ISRU-powered technology to support the development of infrastructure through 3D printing, the key deliverables aimed for mass production include:

- **Infrastructure Development:**
  - Launchpads
  - Roadways
  - Piping
- **Supply Chain Management:**
  - Repair Parts
  - Simple Tools
  - Bricks For Habitats

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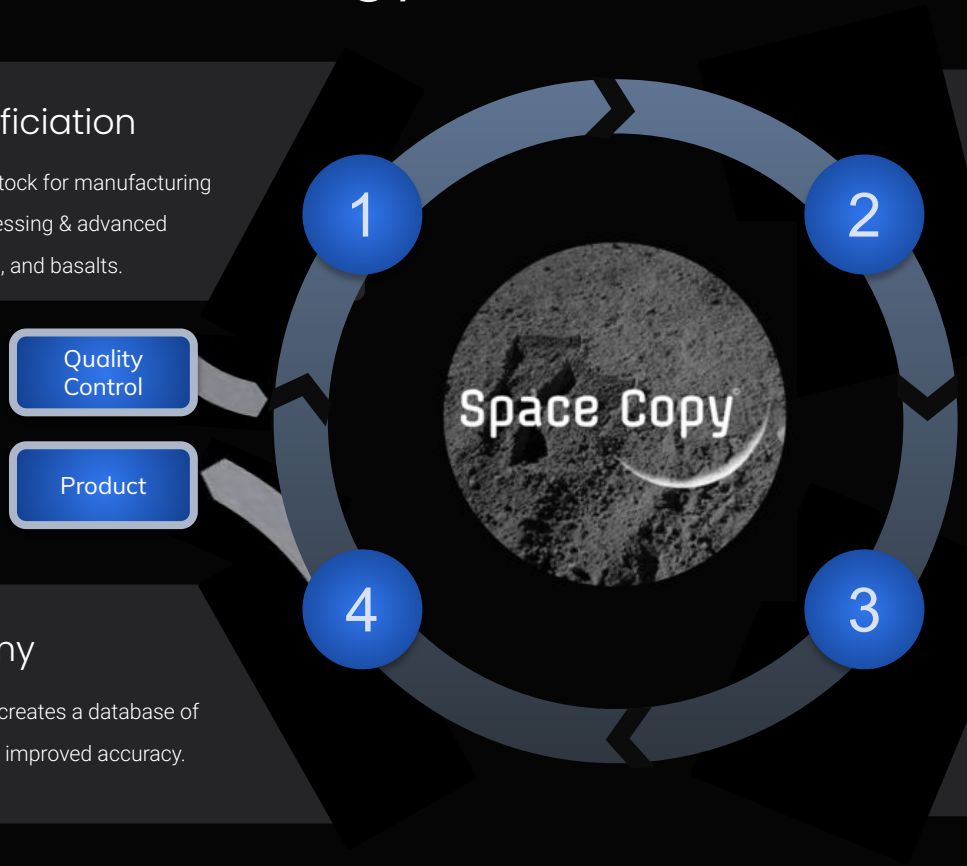
How Our Technology Works

Mixing/Beneficiation

Creates custom feedstock for manufacturing using extraction, processing & advanced sieving on soils, sands, and basalts.

Feedstock Sampling

Uses Raman Spectroscopy to scan & analyze soil composition; data is then used to enhance printing process parameters.



AI & Autonomy

Controls autonomy and creates a database of recorded parameters for improved accuracy.

3D Printing

Uses SLM and FDM printing to create supplies and infrastructure.

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So What Do We Create?

- Precision tools
- Small replacement parts
- Pieces of equipment for drones, rovers, tanks, spacecraft, vehicles, etc.
- Nuts, bolts, nails, screws
- O-rings
- Fasteners
- Small load-bearing parts
- Textiles

- Trusses
- Pipes
- Rods
- Scaffolding-like supports
- Precision tools (wrench, screwdriver, hammer)
- Larger replacement parts
- Large load-bearing parts
- Turbine blades

And More...

FEATURES

Lifecycle Management: Key Features & Benefits

Speed	»	Produces rapid parts and consumables for onsite provisioning & reduces downtime impacts by <70%
Ease of Use	»	Space Copy specializes in closed-loop additive manufacturing and materials processing
Flexibility	»	Uses local, onsite materials to create infrastructure tailored to your operational needs.
Cost Savings	»	Multipurpose operations management tool for integrated supply-chains

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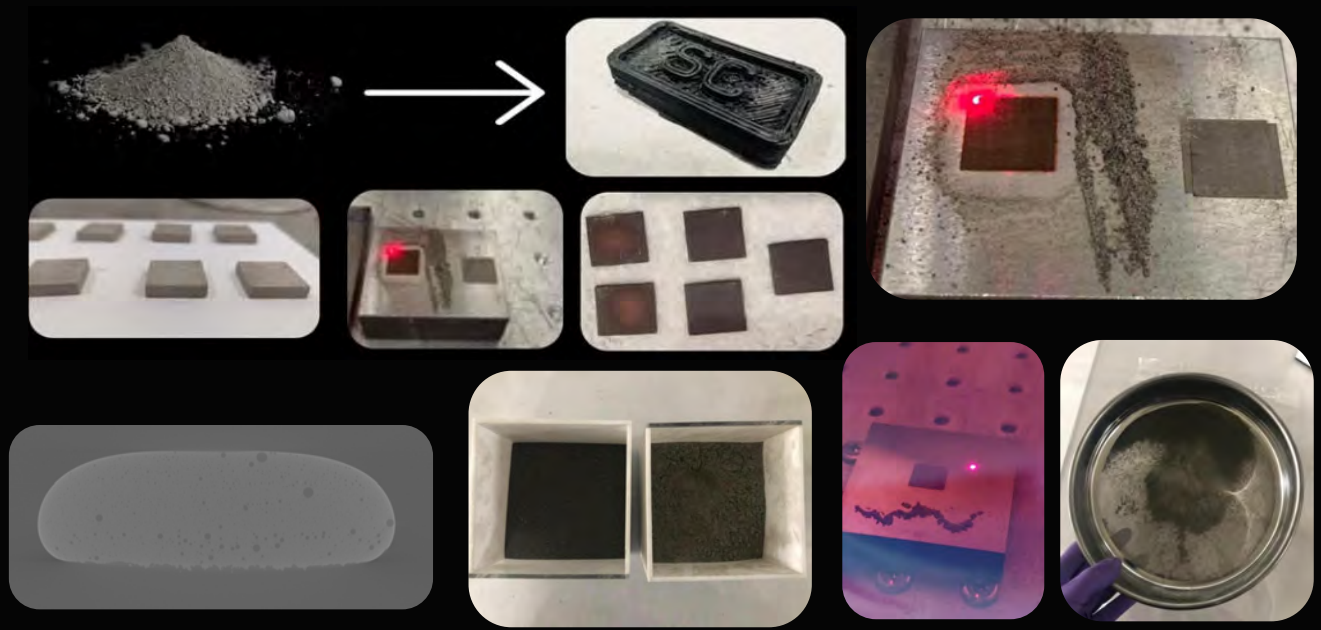
Technology Readiness Level

1. Basic research
2. Applied research
3. Proof of concept
4. **Lab validation**
5. Simulated testing
6. Prototype demo
7. Field testing
8. System complete
9. Mission proven

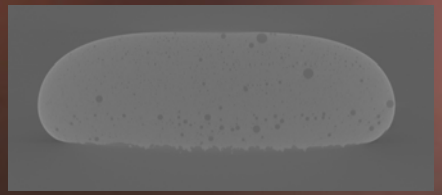


FEATURES

Successful Micro CT for Space Copy Bricks

Johns Hopkins' HyFIRE facility conducted Micro CT scanning of our LHS-1D Lunar Simulant bricks.

Sintered brick from LHS-1D



X-ray Microtomography scan of LHS-1D brick

HyFIRE Chamber Preview

Above-Average Strength

Samples show above average strength, ensuring structural integrity.

Reliable

Scans reveal defect-free structure, boosting confidence for long-duration missions.

Future Micrometeorite Simulation

Upcoming tests will simulate micrometeorite impacts using a 2-stage light gas gun at 7 km/s.

Lunar Regolith Simulant Beneficiation Experiment

Custom adaptation of OPRH2N simulant with a larger particle size distribution (PSD).

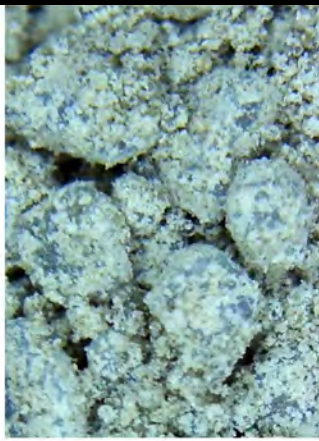
Control


1 min


2 min


3 min


Control: 50x


3 min

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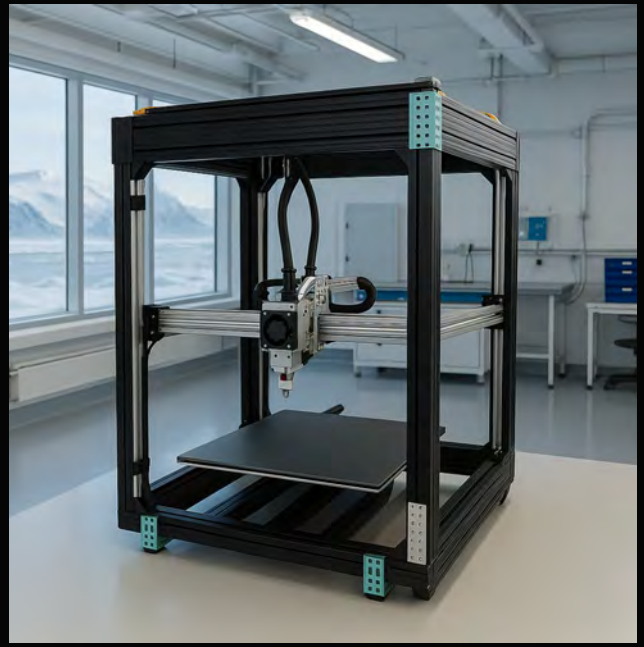
First Prototype Built

Our FDM-1 model is complete. Capable of using regolith, basalt, rock, and sand to build infrastructure up to a meter in size.



Created in Partnership with University of Alberta SMART Lab

What's Next?

THIS YEAR

- Full laboratory validation (2025)
- Printing 100+ tools, bricks, and basic parts (2025)
- Environmental ambient and arctic field testing (2026)

NEXT YEAR

- Scale and replicate technology for commercial deployment (2026)
- Conduct cislunar flight test (2026)
- Pilot sales for defense tech (2026/27)

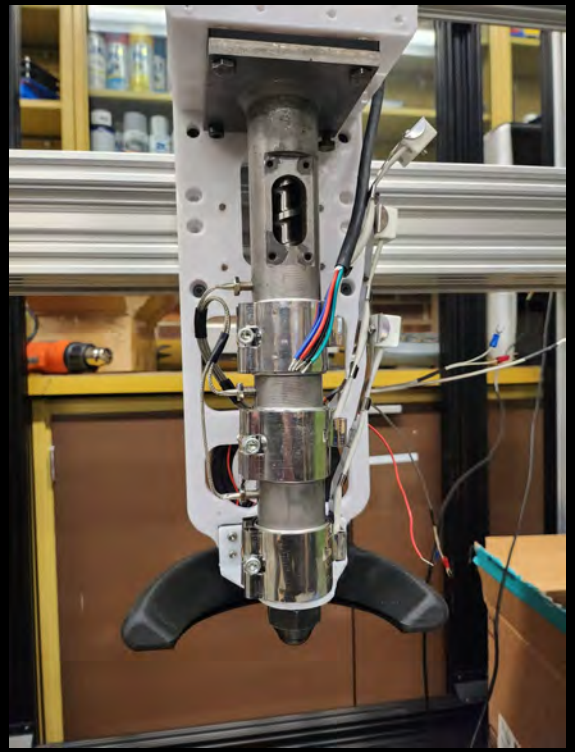
2026 Field Test: Deploy 1st FDM Printer at Haughton Crater Complex and the MARS Arctic Research Station.

- Haughton Impact Crater: 20 km in diameter - 1.7 km deep
- Located on Devon Island, Nunavut
- Holds relevant material properties to terrestrial and space-based resources

Mission Goal: To validate in-situ printing of local soils into usable infrastructure in an extreme cold environment.

Engaging Recycling And Sustainability For A Circular Economy

- Local resource utilization reduces material transport costs by up to 70% Using in-situ materials like regolith, sand, and soil for additive manufacturing eliminates the need to ship conventional building supplies. This can save *$1,000–$10,000 per kg* of transported material.
- On Earth, rural mining and construction sites benefit from reduced logistics costs and faster deployment. Recycled metals and plastics lower environmental impact and material expenses by 30–60%
- Studies show that using regolith-polymer blends or recycled plastic pellets can cut material costs by *30–60%* compared to traditional concrete or steel. This supports circularity by turning waste into durable infrastructure.
- Modular 3D printing accelerates remote construction by 50% and reduces labor needs. Automated 3D printing systems can build shelters, mining infrastructure, and roads with minimal human intervention.



ISRU Pathways and Networks

INTERPLANETARY CHAMBER
OF COMMERCE

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Canada’s Space Metrics

- Canada has over **200 space-related companies**, including established players and emerging startups.
- Canada's space sector receives approximately **$400M CAD annually** in government funding, with additional private investments contributing significantly.
- **Key Contributions**:
    - Canadians are leading in **robotics** and **space medicine.**
    - Developing **AI-powered satellite systems** for Earth observation and climate monitoring.
    - Advancing **lunar exploration technologies**, including mining and ISRU initiatives.
- Canadian startups are innovating in **space debris management**, **hyperspectral imaging**, and **lunar infrastructure development** to compete globally in the "2nd space race."

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Collaboration Opportunities

3 Month Remote Internship Programs For Early STEM Professionals

- Hands-on learning and growth with a dynamic, international team, held biannually (Winter and Summer).
- Opportunity to solve dual-use technology challenges on Earth and in-space.
- Work alongside subject matter experts from NASA and our esteemed industry partners.
- Intern Specializations include: Engineering, ISRU, Physics, Computer Science/AI, Public Policy, Finance, Graphic Design, and Geology.
- Useful for academic co-op's and work experience.

Partnerships and Research Projects For Private Industry and Academia

- Collaboration opportunities with private industry and academic institutions
- Joint research projects in advanced manufacturing and lunar technologies
- Custom solutions for aerospace, defense, and extreme environment applications
- Educational partnerships to advance STEM innovation and workforce development

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Future Initiatives

Space Copy is focused on fostering increased STEM participation in youth, providing early exposure through hands-on learning, showcasing diverse role models and offering mentorship, while also promoting community engagement and collaboration among schools, businesses, and organizations, in Canada, and across the globe.

How?

- Research Partnerships
- Fundraising
- Field Testing
- Educational Workshops

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Insights:

“STEM is built upon the foundation of collaboration: by fostering innovation and breaking down barriers, we set the precedent for our global future.”

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Visit Google Forms to Start Engaging in the Quiz

Winning Prizes:

1st Place: Guaranteed Spot In Space Copy Summer 2026 Internship Cohort

2nd Place: Special Invitation To Present Online For Our Next Virtual Conference

3rd Place: 1-1 Mentor Office Hours Session With The Space Copy Team

Email Us: info@spacecopy.com

Thank You

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