NASA Entrepreneurs Challenge 2023

Moon Matter Makers

Building from the ground up

Dr. Alexander Litvin
alex.litvin@crimsonag.com

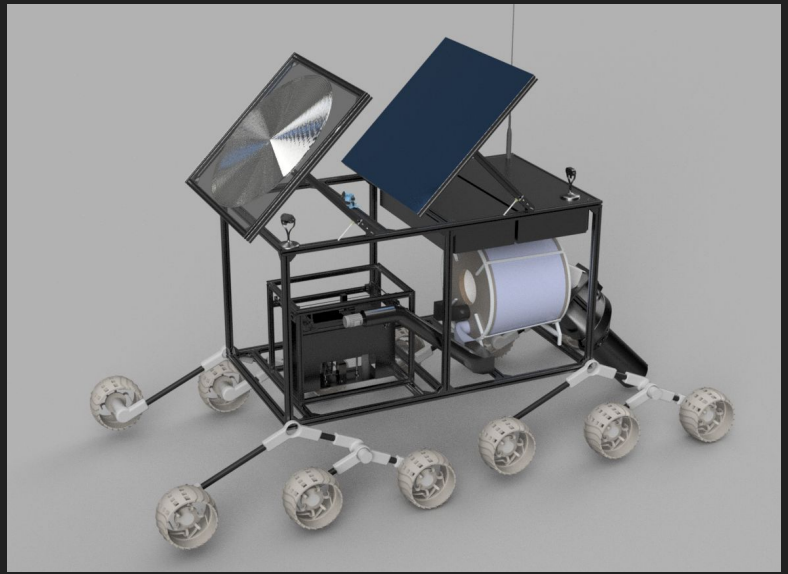
Jason Reynolds
Jason@jinxbot.com

Proposed Solution & Impact

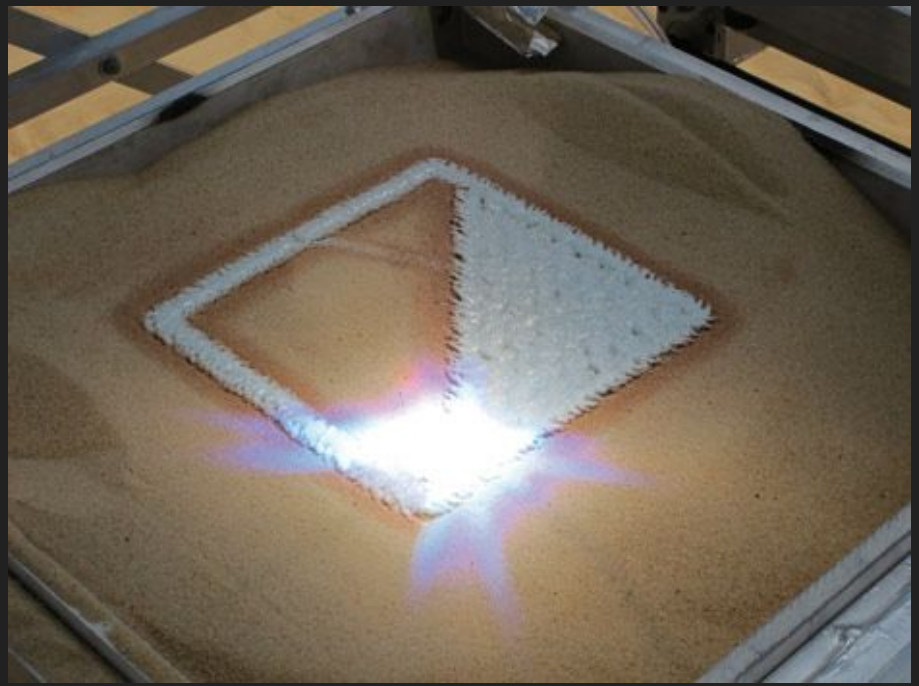
Our proposal focuses on facilitating the construction of habitats on the Moon by overcoming the challenge of limited resources.

We've developed a robust lunar 3D printer rover that serves as a practical solution.

This rover is designed to continually produce essential building blocks for lunar infrastructure, providing critically needed shielding from cosmic radiation and small meteorites.



Proposed Solution & Impact



Proposed Solution Fit

Problem:
Building sustainable structures on the Moon is limited by high costs and logistical complexities of transporting materials from Earth.

Solution:
Develop an autonomous mobile 3D printer that uses lunar regolith as its raw material. This innovation eliminates the need to transport construction materials to the Moon, thereby reducing overall mission costs.

Impact
Our solution impacts both science and exploration communities by enabling fast and affordable infrastructure development and exploration.
This offers potential breakthroughs and advancements in more efficient terrestrial infrastructure manufacturing.

Market Potential

Target Market:

Our main customers are NASA, other global space agencies, and private firms in space exploration and colonization.

Need and Opportunity:

Our tech tackles the real issue of sustainably building on the Moon and beyond, by using in-situ resources. This means cheaper and faster space construction and the potential for long-term habitats. The continual building aspect allows for substantial infrastructure support as well as custom component manufacturing well before human arrival.

Customer Pain Point

1. Cost heavy Infrastructure development in space

2. Difficult resupply and growth potential of building sites

Market Demand

1. Drive to build on the Moon.

2. Agencies and companies in need for solutions that can autonomously build toward an initial foundation quickly and affordably.

Solution & Differentiation:

While there are some 3D printing efforts for space, our unique angle is a mobile, autonomous printer that navigates the lunar surface creating the foundational components for large-scale infrastructure construction using solar radiation as a medium. Additionally it is designed to be 100% re-purposed for use or spare parts as need in other NASA designed electronics and life-support system. No direct competitors offer this feature.

Market Potential

Target Market:

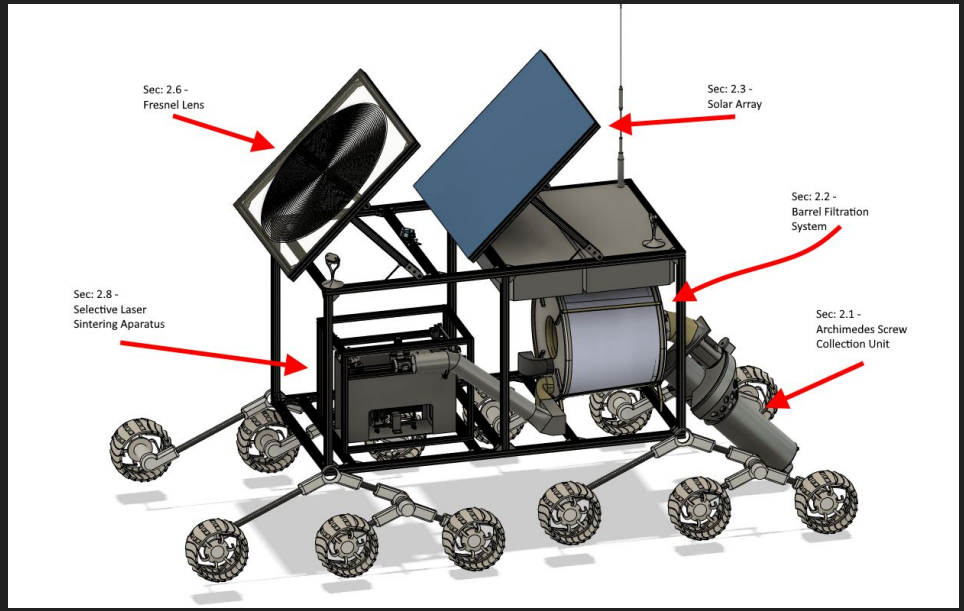
Our focus is on NASA, international space agencies, and private space exploration entities.

Solution's Value Proposition:

Our technology offers a revolutionary approach to constructing on celestial bodies like the Moon, leveraging local resources to optimize efficiency and sustainability. This rover is capable of building the components and infrastructure of new outposts, and then be re-utilized for emergency support of life-support systems by adopting specific design constraints in alignment with NASA requirements.

Key Advantages:

Our method promises substantial cost and time savings in off-Earth construction, facilitating the development of enduring space habitats. This not only benefits space professionals, such as astronauts and researchers, but also represents a significant leap forward for humanity's aspirations in space exploration and habitation.



Business Model

Offering	Target Market	Value Proposition
A state-of-the-art mobile 3D printer designed to fabricate customized construction materials using lunar regolith.	Space agencies and private entities dedicated to lunar exploration. This includes initial science programs for research, but can ultimately evolve to servicing future space colonization and interplanetary commerce.	By harnessing in-situ materials, we offer a sustainable and cost-efficient solution for lunar construction, mitigating the need for resource transportation from Earth.

Business Model

Strategic Roadmap:

1. Develop and rigorously test our prototype.
2. Secure patents safeguarding our innovative technology.
3. Foster strategic collaborations with prominent space companies.
4. Pursue diversified funding avenues, encompassing investors and grants.

Revenue Streams:

- Direct sales or lease agreements for our 3D printer.
- Licensing our patented technology.
- Contractual collaborations with space agencies and companies.

Expenditure Breakdown:
Our primary costs are anchored in R&D, procuring materials and equipment, and recruiting top-tier talent. Funding sources like grants, investor capital, and our own revenue channels will address these expenditures.

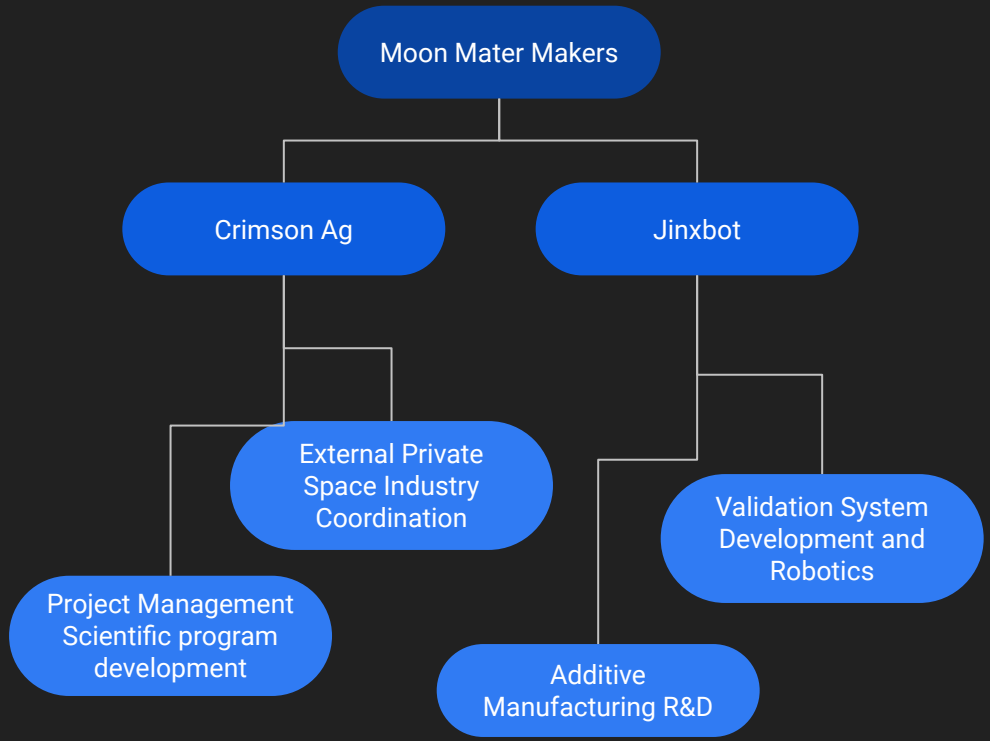
Financial Projections:
Our trajectory towards profitability hinges on amplifying operations, broadening our clientele, and penetrating emerging space markets. A profitability milestone is anticipated within a five-year horizon.

Team

Our ensemble is grounded on the pillars of scientific rigor and vast expertise in systems automation and printing. Collectively, we harness over two decades of domain-specific experience. To ensure holistic growth, we continually identify competencies and integrate them either through recruitment or academic collaborations.

Collaborative Synergy:

Both Dr. Litvin and Mr. Reynolds seamlessly integrate their distinct proficiencies to drive innovation in lunar construction technology. Mr. Reynolds' forte in additive manufacturing and market outreach complements Dr. Litvin's acumen in systems automation, ensuring a robust and visionary path forward for the project.



Team

Dr. Alexander Litvin:
Role: Project Manager and Lead Science Officer for Technical Development
Background:

- Expertise exceeding a decade in sensor-based automation, primarily in the AgTech industry.
- Synthesizes scientific understanding with technology, fostering cross-functional efficacy.
- Operates Crimson Ag, a consulting firm focusing on systems automation and biofeedback.

Jason Reynolds:
Role: Lead for Additive Manufacturing, Business Development, and Marketing
Background:

- Over 13 years in the technology domain, with experience spanning solar energy, manufacturing engineering, and 3D printing.
- Founded Jinxbot 3D Printing, emphasizing additive manufacturing techniques.

Traction

Problem solving:

Through Jinxbot, Mr. Reynolds has a proven track record of solving additive manufacturing design challenges, while Dr. Litvin has a long career developing R&D programs for product development that satisfy needs.

Joint Vision:

United by a shared passion to pioneer an autonomous 3D printing solution for lunar habitats. We're driven not just by the promise of space exploration, but by the transformative potential of such innovations on Earth.

External Coordination

Bridging additive manufacturing solutions with space-ready robotics, our team will be coordinating development with Orbital Outpost X for systems design and communication, and with academic labs for compartmentalized components.

Traction

Addressing Challenges:

- Pinpointed the critical shortcomings of existing additive manufacturing techniques.
- Concentrating on pioneering enhancements to boost printer reliability and speed.
- Cost-prohibitive extraterrestrial construction

Strategic Approach:

- Adopting Agile methodologies, we've broken down our massive mission into achievable sprints.
- Coordination with public (NASA) and private (OOX) sector space companies and agencies for improved R&D runway.
- Key milestones encompass materials testing, temperature calibration, print strength assessment, and automation refinements.

Future Scope:

- Beyond lunar applications, this venture is poised to develop manufacturing solutions for Earth's extreme environments.
- Our guiding principle remains the betterment of humanity. While expansion is on the horizon, our pursuit of non-profit status underscores our commitment to progress over profit.