No Fuel, No Boundaries

At Astrum Drive Technologies, we have developed a fuel-free, electricity-only space propulsion system that eliminates the need for onboard propellant. Backed by multiple patents and TRL 6–7 prototypes, our technology extends satellite lifespans, reduces launch costs, and enables continuous orbital maneuvering, unlocking scalable in-space logistics, servicing, and deep-space missions.

We are raising capital to fund our orbital demonstration mission, a key milestone that validates in-space performance and transitions Astrum from R&D to revenue. With LOIs from leading space and defense organizations, this positions Astrum Drive to lead the $200B+ satellite propulsion and in-space mobility market.

Problem

Short Operational Lifespans: Current satellites become obsolete within 5 to 10 years.

Vulnerable Defense Assets: Military satellites rely on predictable orbits.

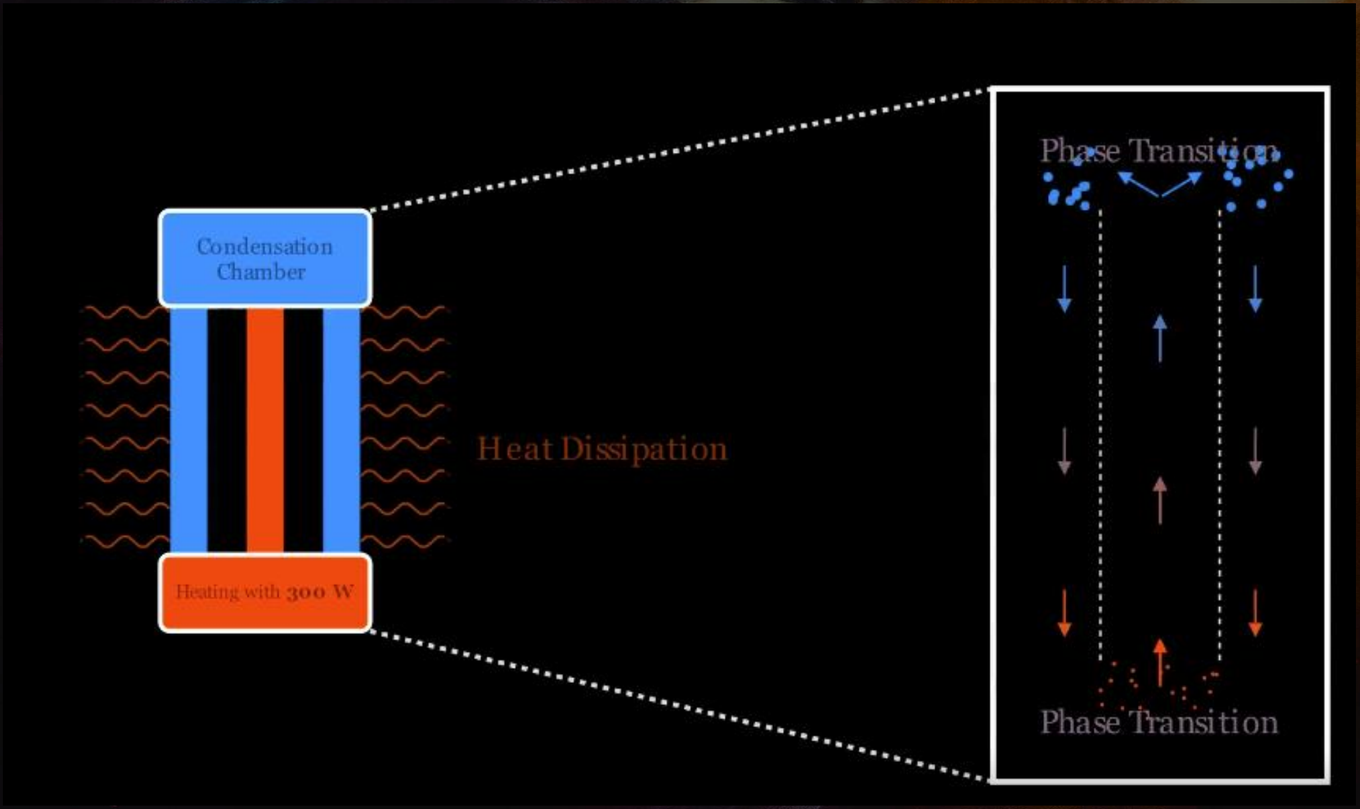
Stalled Commercialization: Deep-space ventures and asteroid mining remain technologically out of reach.

Constrained Exploration: Ultimately, our current technological bottlenecks severely limit the scope of our space missions.

Solution

Space Propulsion System that directly converts electrical energy into continuous thrust, eliminating the need for conventional fuels.

The Astrum Drive propulsion system is based on a 1930 Einstein patent



How the technology works, the basic concept:

The system uses fluid phase transitions to create a momentum imbalance inside a closed system. As momentum is conserved, the system responds with net motion.

Astrum Drive is rewriting the playbook for deep-tech aerospace R&D.

By pairing elite, globally distributed talent with AI-accelerated engineering frameworks, we bypass the bloat and extended timelines of traditional aerospace development.

This lean model drastically shortens the feedback loop between theoretical physics and experimental validation, allowing us to achieve world-class scientific output with unprecedented capital efficiency.

As a result, we have rapidly progressed from theoretical foundations to validated, propellant-free propulsion prototypes, putting us on an aggressive and highly viable trajectory for our 2027 orbital demonstration.

The competition matrix

Today we can do it

Faster

- ⟶ 2–3✕ longer satellite mission life
- ⟶ Increase transfer speed
- ⟶ Decrease time-to-target
- ⟶ Speed up mission

Cheaper

- ⟶ Double payload capacity
- ⟶ Increase spacecrafts range
- ⟶ Eliminate refueling constraints
- ⟶ ~40% lower cost per satellite-year

Better

- ⟶ Enable greater mission flexibility
- ⟶ Enable dynamic maneuvering
- ⟶ Retrofit expiring satellites (patent)
- ⟶ Reduce collision and debris risk

Structural Cost Advantage with Software-Level Margins in Aerospace Hardware

Astrum vs Traditional Propulsion Economics (Per Unit)

Satellite Class	Mass Range	Traditional Propulsion Cost	Astrum Propulsion Cost	Astrum Manufacturing Cost	Astrum Profit per Unit	Astrum Gross Margin
Nano Satellite	1–10 kg	$40,000 – $200,000	$100,000	$25,000	$75,000	75%
Small Satellite	10–200 kg	$200,000 – $1,500,000	$950,000	$50,000	$900,000	95%
Medium Satellite	200–500 kg	$1,000,000 – $3,000,000	$2,000,000	$100,000	$1,900,000	95%
Large Satellite (GEO-class)	>500 kg	$3,000,000 – $15,000,000+	$4,500,000	$150,000	$4,350,000	97%

Primary Customers

Space Agencies, Defense Organizations, Satellite Operators

Signed LOIs

SPACEX

Spacedock

KMI

ENDUROSAT

Space Ocean

Revenue Sources

- Propulsion systems and modules.
- Technology licensing for platform integrations.
- Post-sale support, maintenance, and upgrade packages.

Pricing Structure

- Hardware = typically ~ $0.3-$3M per unit (~$25k - $150k to build – varies by spacecraft class, required thrust/power configuration, and integration scope).
- Licensing = negotiated per OEM / program
- Support contracts and / or per-upgrade fees.

Market Opportunity & GTM

- $200B+ satellite propulsion market
- Opens doors to other $B markets:
  - Space mining
  - Space tourism
  - Retrofitting expiring satellites

Phase 1.

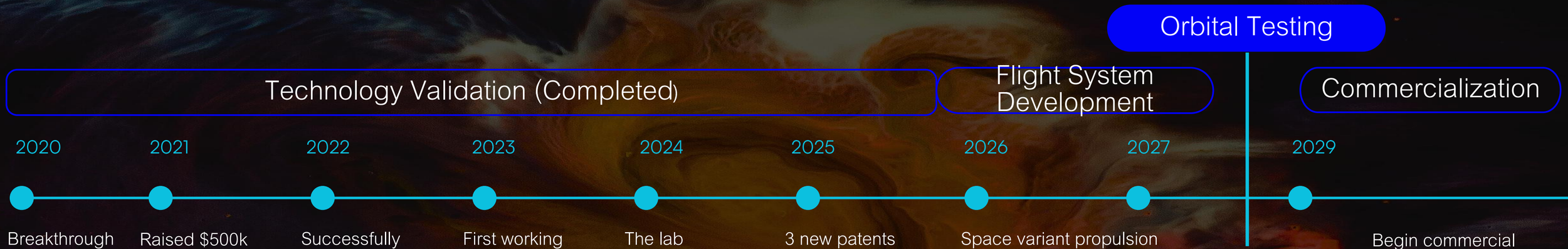
Phase 2.

Phase 3.

Addressable Markets & Strategic Applications

Application	Estimated Market Value (USD)	Time Horizon	Key Players / Indicators
Satellite propulsion solutions	~$115B (2023) → ~$200B (2030) total on-orbit servicing market	2025–2030	Northrop Grumman (MEV/MEP), Intelsat, SES; SpaceLogistics; 500+ GEO satellites active
Retrofits (propulsion modules)	Subset of servicing market; analysts project multi-$B by 2030	2025–2030	Northrop SpaceLogistics (Mission Extension Pods); Intelsat, Optus retrofit programs
Insurance risk reduction	~$0.7B (2024) → ~$0.9–1.0B (2030) total premiums; mitigation services growing	2025–2030	Munich Re, AXA XL; increasing claims (~$0.9B in 2023) driving demand
Deep space exploration & tourism	NASA & agency budgets ~$10–15B/year; space tourism ~$10B by 2030	2025–2035	NASA Artemis, Moon/Mars programs; SpaceX, Blue Origin, Virgin Galactic
Asteroid mining / off-Earth resources	~$1.9B (2024) → ~$5–9B by ~2030	2025–2035	ispace, Planetary Resources; NASA/ESA mining technology initiatives
Defense (stealth propulsion, ISR)	Military satcom ~$30B (2023) → ~$50B by 2032; propulsion tech ~$1–5B segment	2025–2035	US Space Force, DARPA; Lockheed Martin, Boeing; naval propulsion R&D
Emerging (HAPS, UUV, marine)	HAPS: ~$1.5B → ~$2.7B (2030); UUV: ~$4.8B → ~$11B; marine hybrid ~$4B → $10B+	2025–2030	Airbus Zephyr, Alphabet; naval research labs; marine hybrid propulsion vendors

Milestones & Roadmap



2020
Breakthrough

Provisional Patent

2021
Raised $500k Pre-Seed Funding

Simulation completed successfully

2022
Successfully demonstrated the technology in a lab

Patent filed

2023
First working prototype

2024
The lab prototype surpassed 50mN

Field testing successful

2025
3 new patents filed

Working on orbital prototype

Completed system validation

2026
Space variant propulsion system + custom vacuum chamber.
3rd-party hard-vacuum thrust test: torsion balance, horizontal axis, reversibility verified.

Complete launch readiness

2029
Begin commercial deployments

Scale production

Space Demonstration

Orbital demonstration represents the primary technical risk reduction and unlocks full commercial adoption. This funding round fully finances Astrum through orbital demonstration, the milestone required to unlock commercial deployment and significant valuation growth.

Seed Round

$2M seed to fund vacuum chamber testing and reach orbital demonstration readiness
The milestone that unlocks commercial deployment.

01
IP Expansion
Extend patent coverage globally to protect our propulsion technology across key markets.

02
Prototype Development.
Vacuum chamber tests.
Complete launch readiness
For the orbital demonstration.

03
Government Relations
Engage Artemis Group to represent Astrum before the U.S. government & military.

CURRENT RUNWAY
18 months

RAISED TO DATE
$500K
pre-seed

FOUNDER OWNED
95%
Clean cap table

NON-DILUTIVE
NSF Grant
Funding received

Foundational Space Infrastructure Platform with Clear Billion-Dollar Exit Precedent

Strategic Acquisition Path (Primary)

Likely acquirers: defense primes, satellite OEMs, propulsion suppliers, and in-orbit services providers

Strategic rationale

Propellantless propulsion platform eliminating fuel dependency enables new mission classes: in-orbit logistics, servicing, deep-space and resource utilization. Exclusive IP and flight-proven architecture create structural competitive advantage.

Transaction triggers

Successful orbital demonstration · Initial scaled production orders · OEM integration agreements

Public Market Exit Precedent

Multiple space infrastructure companies achieved $1B–$8B+ valuations:

Virgin Galactic	Terran Orbital
Rocket Lab	Virgin orbit
Planet Labs	Arqit
Spire Global	Intuitive Machines
Astra	Voyager Technologies
Blacksky	Firefly Aerospace
AST Spacemobile	Karman Space

Expected Exit Profile

Exit horizon: 5–8 years
Revenue at scale: $100M+ annually
Potential valuation range: $500M – $2B+

Discussions

Government contracting discussions

Discussions on military applications

Partnership pathways

Collaborations

Google

Astrum Drive Receives Cloud Credit Investment from Google.

NASA

Invited us to present and demonstrate the technology; discussing development partnerships.

NSF

Received grant funding and ongoing support.

STAR TREK

E. Rod Roddenberry (Executive Producer): “Astrum Drive embodies the spirit of exploration and innovation that inspired Star Trek.

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

Signed an LOI; meet regularly with the propulsion department.

Lawrence Livermore National Laboratory

Collaborating on advanced propulsion research.

TECHNICAL UNIVERSITY SOFIA

Ongoing collaboration; independent testing of propulsion prototypes.

BU Baylor University

Regular meetings and project updates.

Unit Economics

Launch Cost Savings (Per Satellite)

Metric	Nano	Small	Large
Launch Cost (Traditional)	$30,000	$1,500,000	$17,000,000
Launch Cost (Astrum)	$25,000	$1,200,000	$9,000,000
Launch Cost Savings	**$5,000**	**$300,000**	**$8,000,000**
Launch Cost Reduction	**17%**	**20%**	**47%**

“These savings result from reduced launch mass, enabled by Astrum’s propulsion architecture, which removes the requirement for onboard propellant.“

Mission Economics Improvement

Metric	Nano	Small	Large
Mission Duration (Traditional)	7 yrs	7 yrs	10 yrs
Mission Duration (Astrum)	12 yrs	15 yrs	20 yrs
Cost per Year (Traditional)	$42,857	$142,857	$30,000,000
Cost per Year (Astrum)	$25,000	$66,667	$15,000,000
Annual Cost Reduction	**42%**	**53%**	**50%**

Satellite Mass Reduction

Metric	Nano	Small	Large
Wet Weight	6 kg	300 kg	3,400 kg
Dry Weight (Astrum)	5 kg	240 kg	1,800 kg
Mass Reduction	**17%**	**20%**	**47%**

Dr. Eng. Ivaylo Vasilev, MBA

Founder & CEO

20+ years delivering complex engineering programs across Fortune 500 organizations.

Prof. Dr. Olaf J Groth

Board Member & Strategic Advisor

Strategic advisor focused on global partnerships, geopolitics, and commercialization strategy.

Prof. Dr. Nelson Bolivar

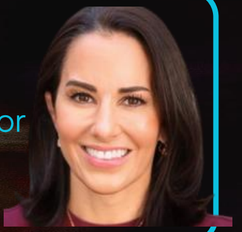
Co-Founder, CTO

Physicist with 20+ years in theoretical physics, propulsion modeling, and experimental validation.

Jackie Space

Board Member & Government Programs Advisor

United States Space and Air Force Veteran.



Prof. Dr. Gabriel Poleo

Advanced Research

Theoretical physicist specializing in General Relativity, spacetime modeling, and advanced field theory.

Jack R. Smith

Board Member & Strategic Advisor

United States Air Force Veteran, Space Force Association.

Prof. Dr. Eng. Georgi Todorov

Board Member & Engineering Advisor

Longest-serving dean at Technical University of Sofia, expert in advanced engineering and prototyping.

Eng. Ivo Evgeniev

Board Member & Investor

Serial enterpreneur, and investor from Alexandrea Invest Group.