



Welcome to

# Spacetech Day **2023**



# MARGO DE NARAY

Vice President & General Manager Space Products and Services — Astra Spacecraft Engine™



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# CHRIS KEMP

Founder, Chairman, and CEO







# SPACE FORCE AWARDS ASTRA NEW LAUNCH ORDER FOR ROCKET 4

APRIL 21, 2023

Task order valued at \$11.45 million for a launch of an ESPA-class space vehicle and additional cubesats through the Orbital Services Program (OSP-4) contract

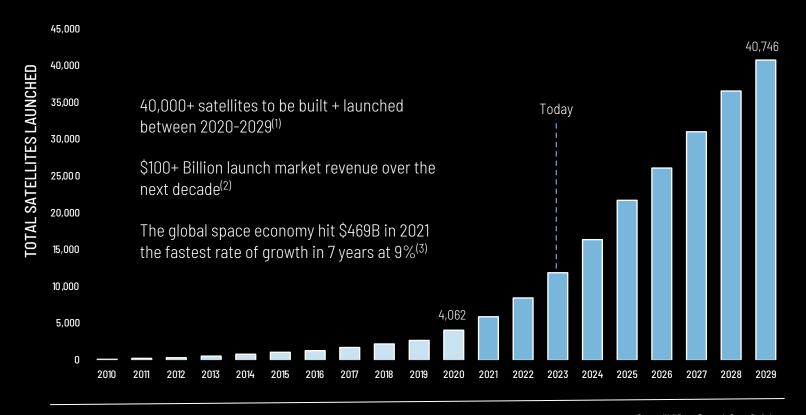
ALAMEDA, Calif. - April 21, 2023 - Astra Space, Inc. ("Astra")(Nasdaq: ASTR) announced today that it has been awarded a launch task order for Rocket 4 through the United States Space Force's Orbital Services Program (OSP)-4 contract.

"The Space Force deliberately structured the OSP-4 contract to leverage emerging launch solutions for mission partners like the DoD Space Test Program," said Lt. Col. Justin Beltz, chief of Space Systems Command's Small Launch and Targets Division. "Today's award reflects the tremendous promise industry is bringing to the table with systems like Rocket 4. We look forward to working with Astra to make this launch a success."

The STP-S29B mission is a Category 2 Mission Assurance launch, which will entail substantial efforts from Astra in tandem with the Government team and its independent mission assurance contractors to support a mission designed for success.

"STP-S29B demands a higher level of mission assurance than previous Astra launches and therefore represents a significant increase in Astra's coordination with the Space Force to perform a launch designed for mission success," said Dr. Thomas Williams, senior director of Federal Sales at Astra. "Astra's ability to compete for this mission was based on the tremendous work that our

## ACCESS TO SPACE REMAINS A CHALLENGE TO MEET GROWING DEMAND



Source: Wall Street Research, Space Capit

- Based on Euroconsult and Astra Management estimates.
- Factors in Euroconsult and Management estimates for satellite launches.
- Source: Space Foundation database / SpaceFoundation.org

## **GLOBAL BROADBAND CONNECTIVITY**

Global demand for broadband connectivity in unserved and underserved communities



### **WEATHER & CLIMATE MONITORING**

Over half of essential climate variables can only be measured from space



## **INTERNET OF THINGS**

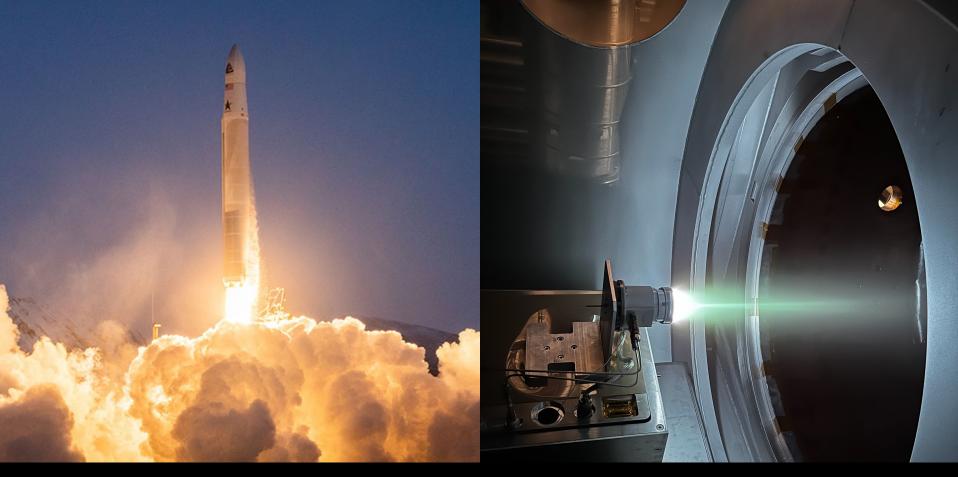
IoT connected devices help in many use cases (autonomous cars, fleet management etc.)



## **ENVIRONMENTAL CONSERVATION**

Satellite data helps identify illegal logging, illegal fishing and illegal wildlife trade that account for more than \$73B per year





LAUNCH SERVICES SPACE PRODUCTS

# RELIABILITY & SCALE

# ROCKET 4



ROCKET PRODUCTION LINE









ROCKET PRODUCTION LINE



MACHINE SHOP





ROCKET PRODUCTION LINE



MACHINE SHOP





ROCKET TEST STANDS PRODUCTION LINE



MACHINE SHOP



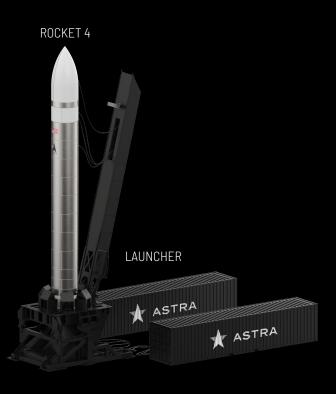
QUALITY CONTROL LAB



TEST STANDS







## LAUNCH SYSTEM

## **SOFTWARE**





MISSION CONTROL



QUALITY CONTROL LAB



TEST STANDS







MACHINE SHOP



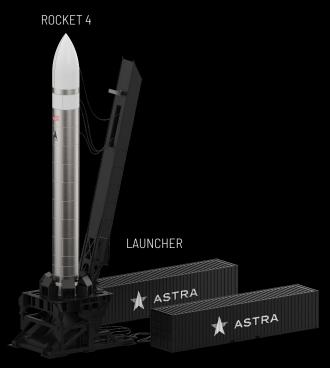
QUALITY CONTROL LAB



TEST STANDS

ROCKET

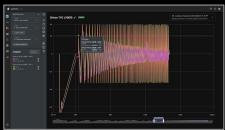
PRODUCTION LINE



SOFTWARE



MISSION CONTROL



DATA PLATFORM

## LAUNCH SYSTEM

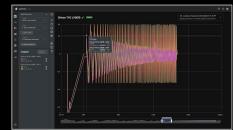
## **SOFTWARE**







MISSION CONTROL





ROCKET TEST STA

TEST STANDS

QUALITY CONTROL LAB

LAUNCH SYSTEM SIMULATOR





MACHINE SHOP



**OUALITY CONTROL LAB** 



ROCKET TEST STANDS PRODUCTION LINE

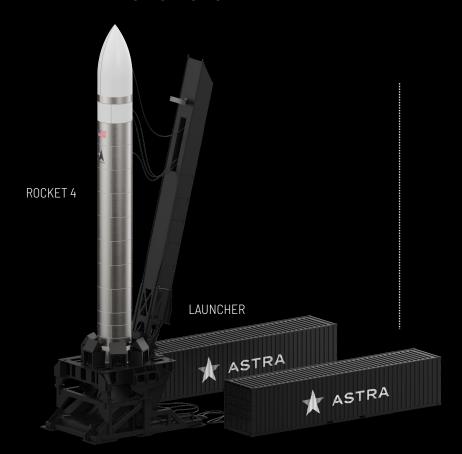
**DESIGNED TO PRODUCE 1 ROCKET PER DAY** 

100% OF CRITICAL COMPONENTS PASS THROUGH OUR QUALITY CONTROL LAB

**NEXT DAY PART PRODUCTION** 

ABILITY TO TEST NEARLY EVERYTHING ON SITE

## LAUNCH SYSTEM



**MOBILE** 

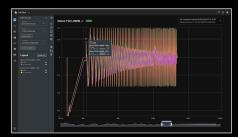
**SMALL TEAM OPERATION** 

1-DAY TURNAROUND CAPABILITY

## **SOFTWARE**



MISSION CONTROL



DATA PLATFORM



LAUNCH SYSTEM SIMULATOR

TWO PERSON MISSION CONTROL

**DESIGNED FOR 24-HOUR CONOPS** 

SIMULATES FULL LAUNCH SYSTEM

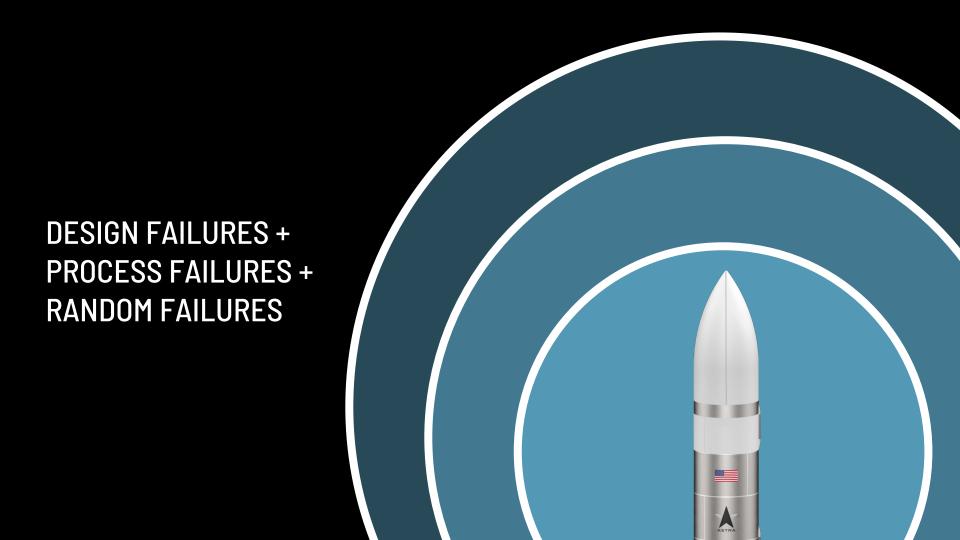


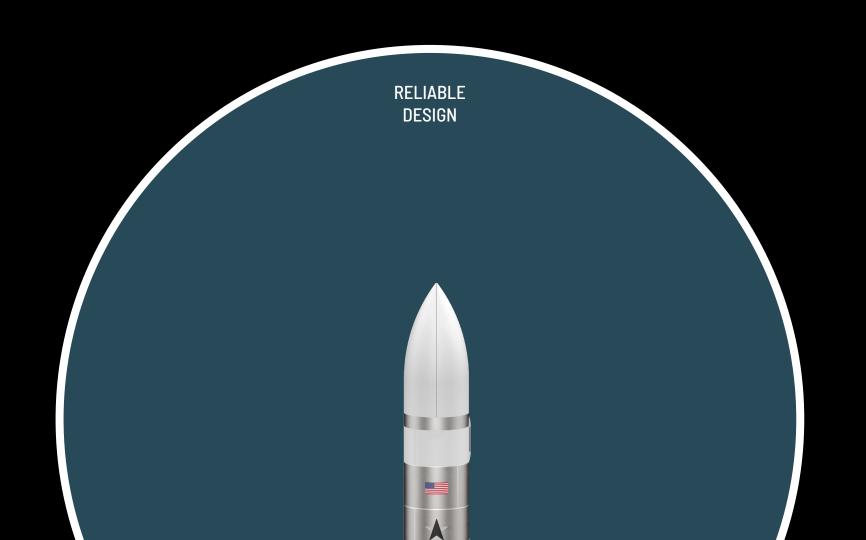
# DR. ADAM LONDON

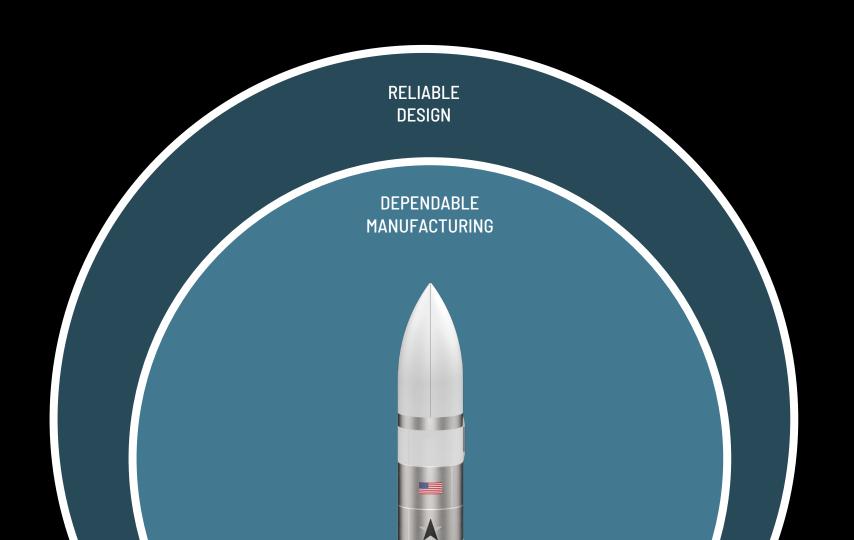
Founder and CTO

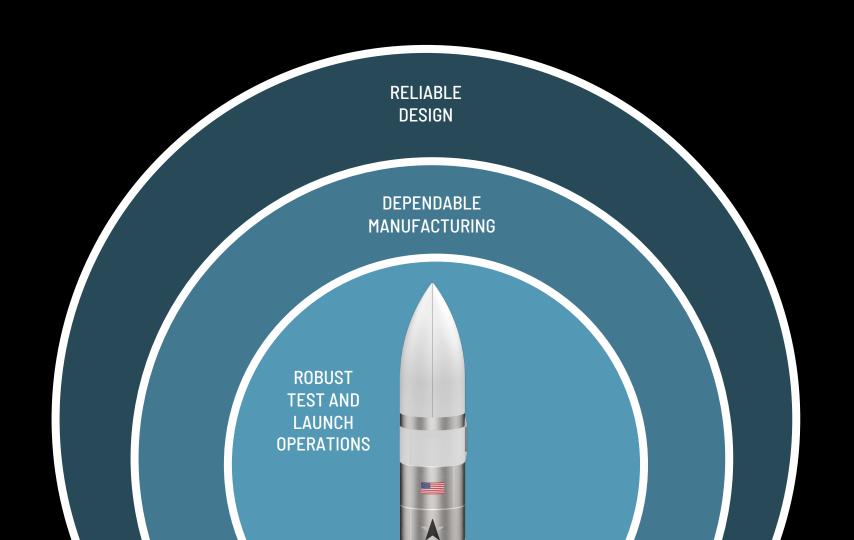
# RELIABILITY







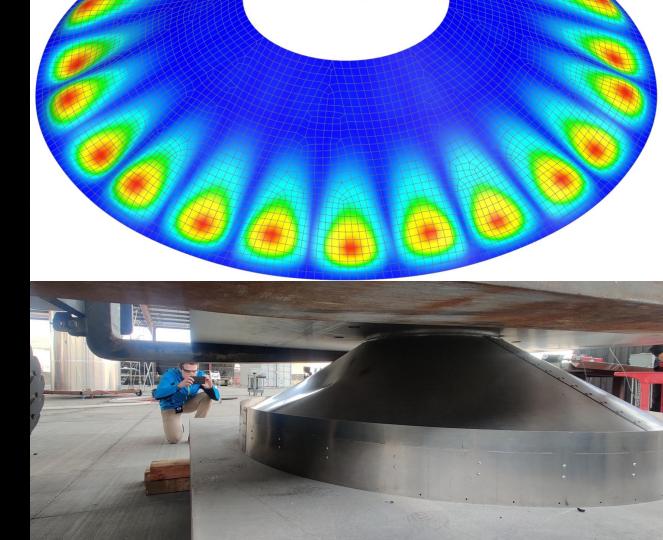




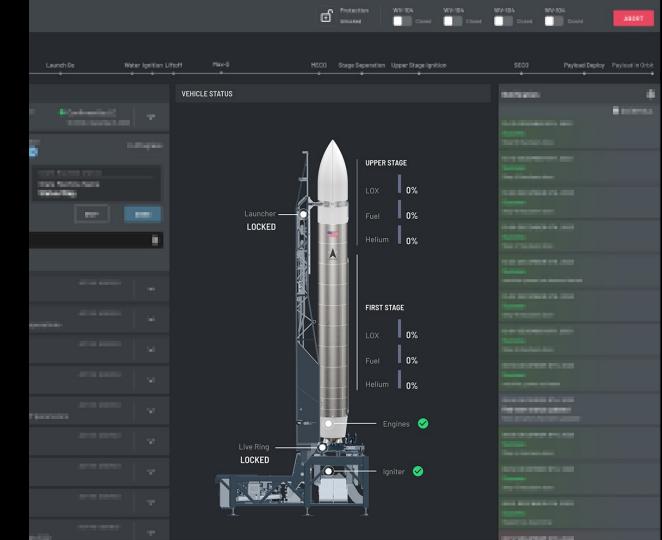




## RELIABLE DESIGN



### RELIABLE DESIGN



### RELIABLE DESIGN

















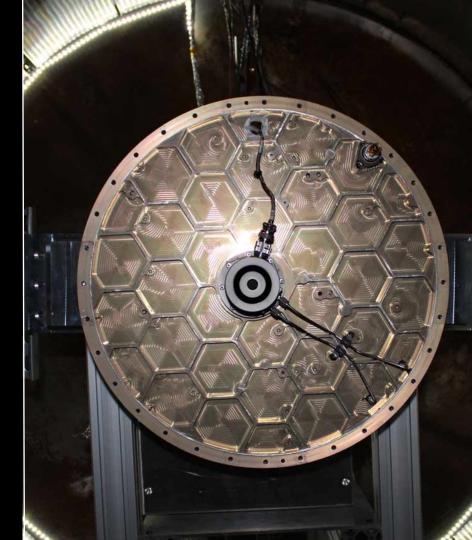
### MARGO DE NARAY

Vice President & General Manager Space Products and Services — Astra Spacecraft Engine™

#### ASTRA SPACECRAFT ENGINE™

Flight-Proven Electric Propulsion Systems

- Scaling to serve constellations
- Currently at work on orbit
- 800+ on orbit burns





**ORBIT RAISING** 



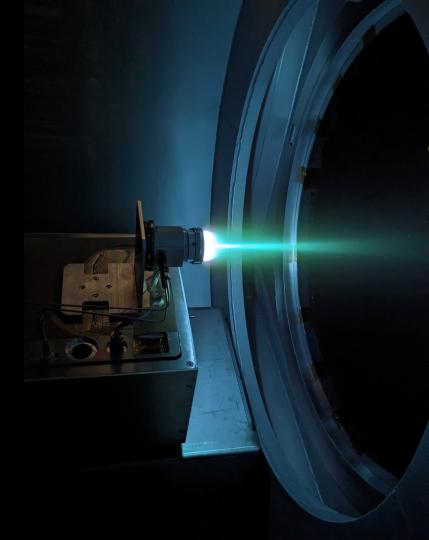
STATION KEEPING



**COLLISION AVOIDANCE** 



DE-ORBITING



#### ASTRA SPACECRAFT ENGINE™ SYSTEM OVERVIEW

THRUST: 25 mN

SPECIFIC IMPULSE: 1,400 s

TOTAL IMPULSE: 300 kN-s

INPUT POWER: 400 W

VOLTAGE: 27-34 V DC

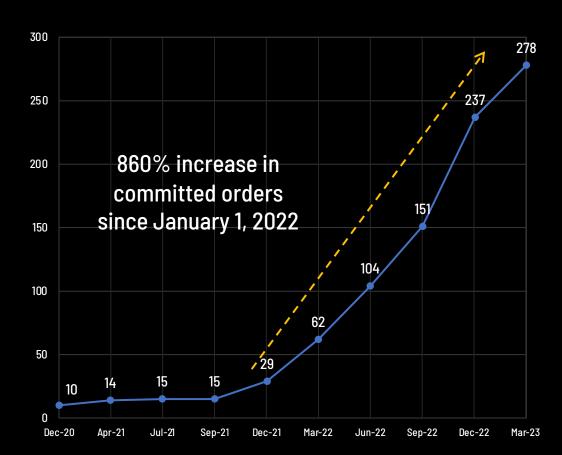
**COMPACT & RELIABLE THRUSTER** 



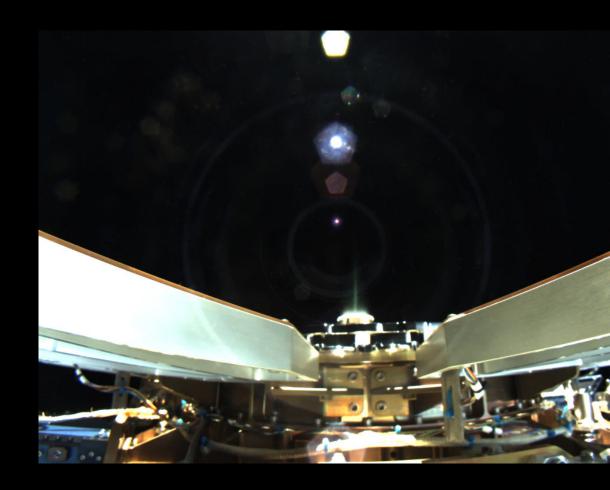
FEED SYSTEM WITH HERITAGE COMPONENTS

FLIGHT-PROVEN PROPELLANT TANK

# 278 CUMULATIVE COMMITTED ORDERS OF THE ASTRA SPACECRAFT ENGINETM

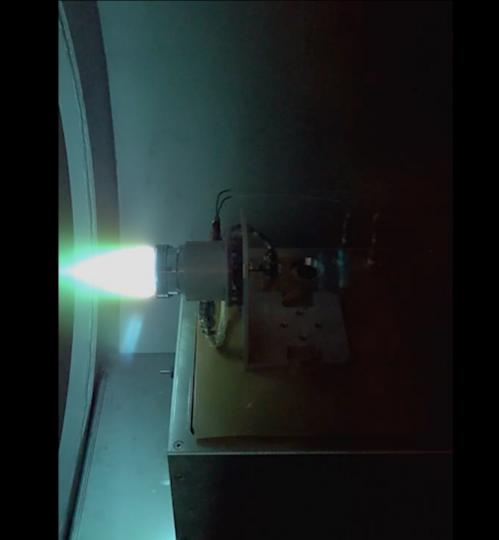


### 9 ASTRA SPACECRAFT ENGINES ON ORBIT!



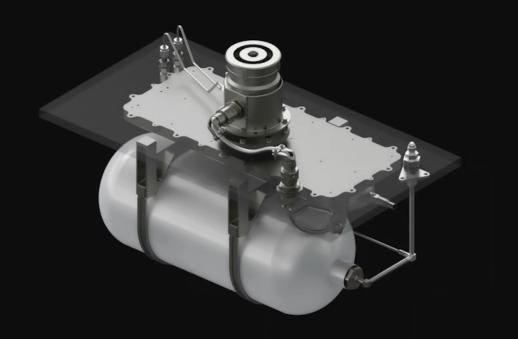














### ONE MORE THING...





