

# ULA NATIONAL ACADEMIES COMMITTEE ON BIOLOGICAL AND PHYSICAL SCIENCES IN SPACE

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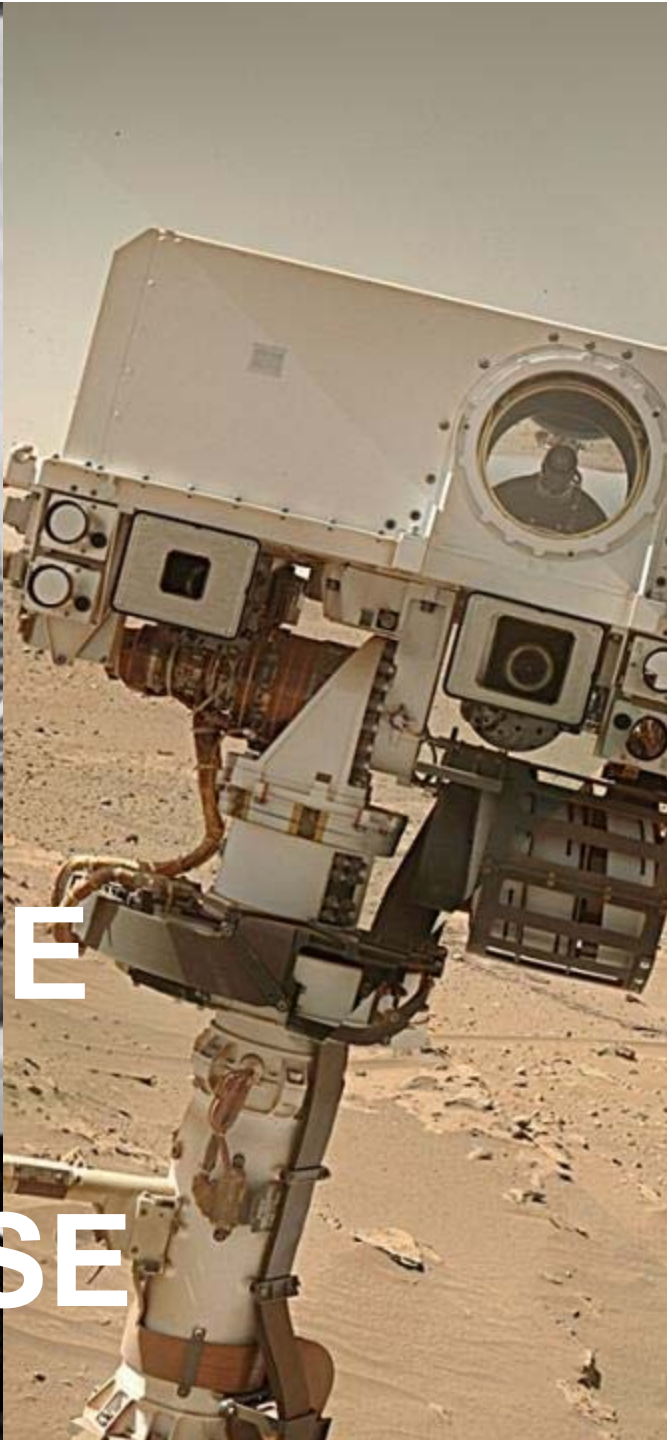
**10.31.17**





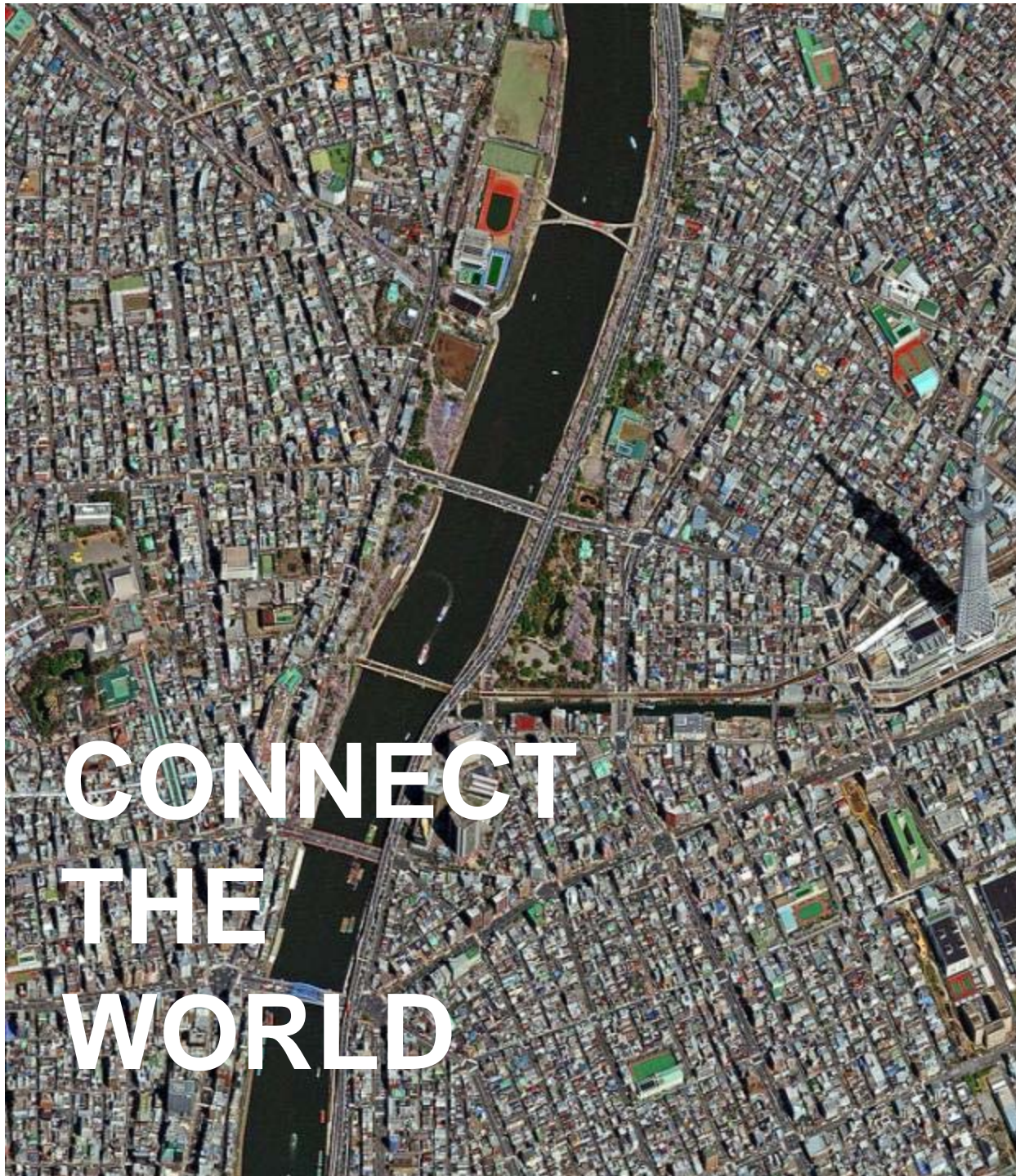
SAVE  
LIVES





EXPLORE  
THE  
UNIVERSE





CONNECT  
THE  
WORLD





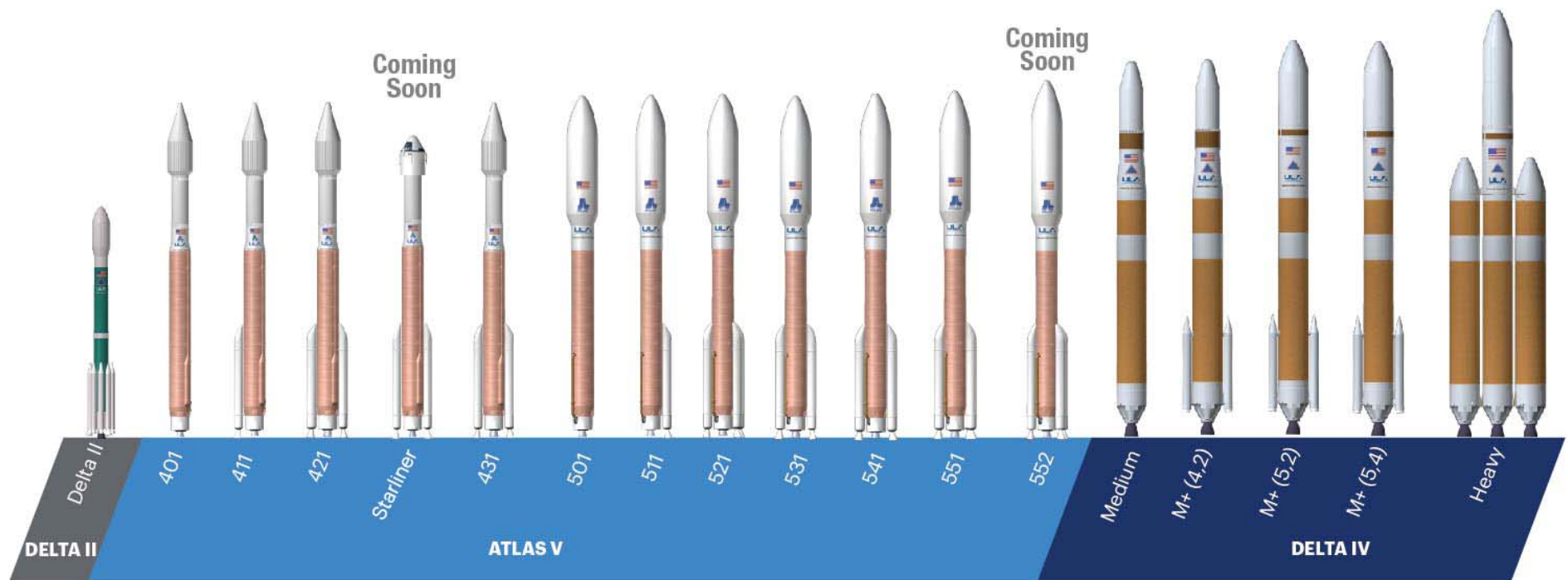
# ONE AT A TIME... 122!



<https://www.youtube.com/watch?v=L5gGqSXJgwo>

# OUR FLEET

41 Configurations



**Any Payload, Any Orbit, Any Time**

# CURRENT ULA CUSTOMERS

## National Security Space



Global Positioning System (GPS)



Intelligence, Surveillance and Reconnaissance



## Commercial Space



Earth Imagery

Commercial Communication



## Civil Space

### Robotic Exploration and Science



Mars Science Laboratory

Pluto New Horizons

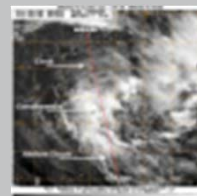


### Increasing Our Knowledge of the Earth and Its Climate



Geostationary Operational Environmental Satellite (GOES)

Cloudsat



## Human Launch



Cargo

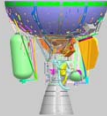



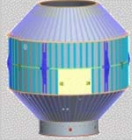



Crew

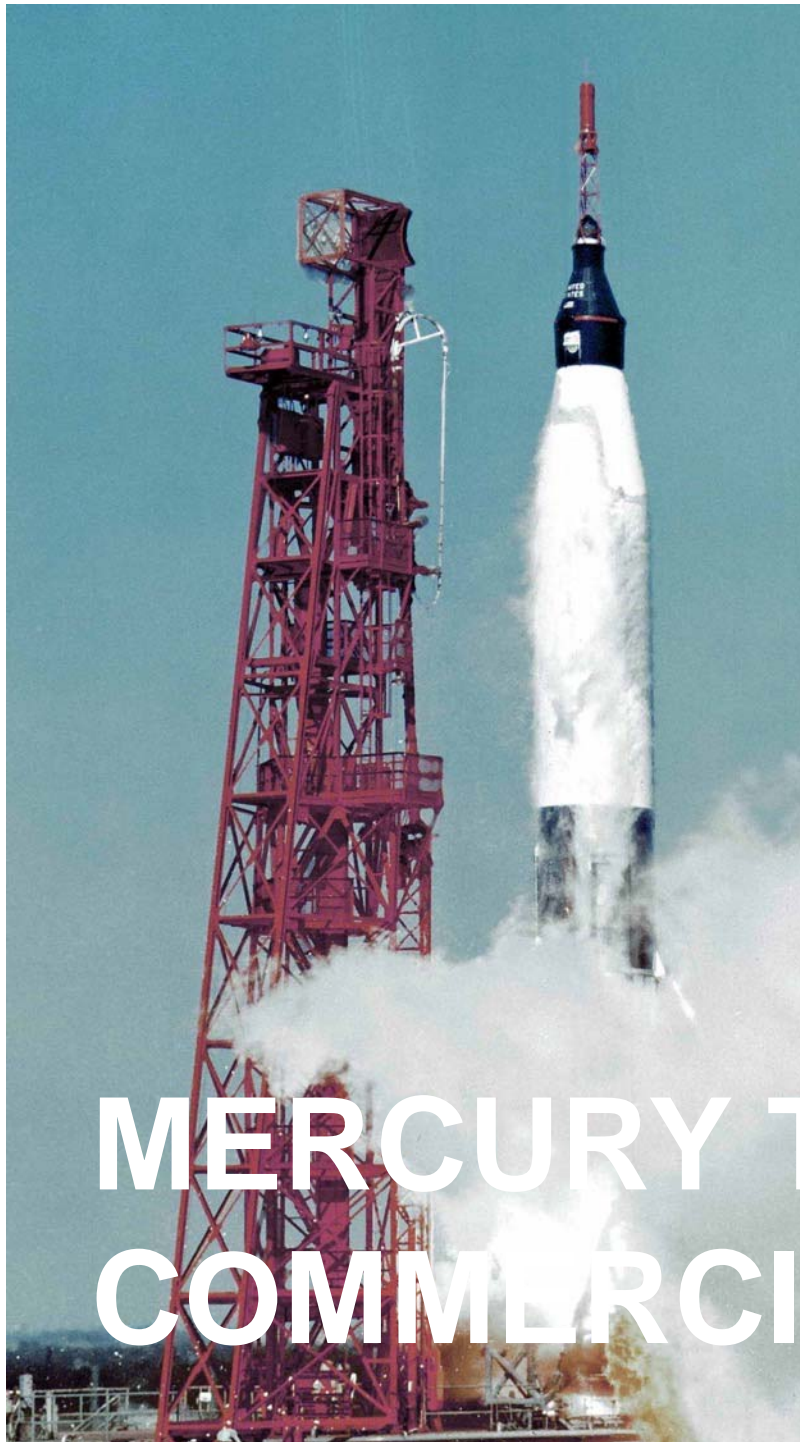
Vulcan ACES Enhances Traditional Mission



# ULA MULTI-MANIFEST CAPABILITY OVERVIEW

	CAPABILITY		STATUS	INTERFACE	MAXIMUM # PER LAUNCH	MAXIMUM MASS PER PAYLOAD	VOLUME PER PAYLOAD	
RIDESHARE	<b>CubeSat Express Aft Bulkhead Carrier (ABC)</b> <i>(Tyvak Nanosatellite Systems)</i>		Operational	15-in Sep System	(4) 6u CubeSats or 1 ABC	80 kg (176 lb)	51 cm x 51 x 76 cm (20 in x 20 in x 30 in)	
	<b>ESPA (EELV Secondary Payload Adapter)</b>		Operational	15-in Sep System	Up to 6 S/C	181 kg (400 lb)	61 cm x 71 cm x 96 cm (24 in x 28 in x 38 in)	
	<b>ESPA Grande (EELV Secondary Payload Adapter)</b>		Operational	24-in Sep System	Up to 4 S/C	318 kg (700 lb)	100 cm x 115 cm x 125 cm* (39 in x 45 in x 49 in*) * For 5m PLF Only	
	<b>AQUILA</b> <i>(Adaptive Launch Solutions)</i>		Qualified	Multiple Configurations	Up to 3 S/C per AQUILA	1,000 kg (2,200 lb)	142-cm dia. x 152 cm (56-in dia. x 60 in)	
DUAL-MANIFEST	<b>DSS-4 (Dual Spacecraft System, 4-m)</b>		CDR Complete	62-in Bolted	1 DSS-4	Forward	2,270 kg (5,000 lb)	365-cm-dia. x 658 cm (144-in-dia. x 259 in) (3-plug)
						Aft	9,000 kg (19,800 lb)	254-cm-dia. x 445 cm (100-in-dia. x 175 in) (3-plug)
	<b>DSS-5 (Dual Spacecraft System, 5-m)</b>		CDR Complete	62-in Bolted	1 DSS-5	Forward	5,440 kg (12,000 lb)	457-cm-dia. x 762 cm (180-in-dia. x 300 in)
						Aft	9,000 kg (19,800 lb)	375-cm-dia. x 487 cm (148-in-dia. x 192 in)





**MERCURY TO  
COMMERCIAL CREW**





# INFRASTRUCTURE UPGRADES FOR HUMAN SPACEFLIGHT



# EM-1 LAUNCH



Photo courtesy of NASA



Credit Sierra Nevada Corporation

# MULTIPLE CARGO CONFIGURATIONS



# SIMPLE AND MORE POWERFUL ROCKET

Atlas V



Delta IV



Vulcan



ACES

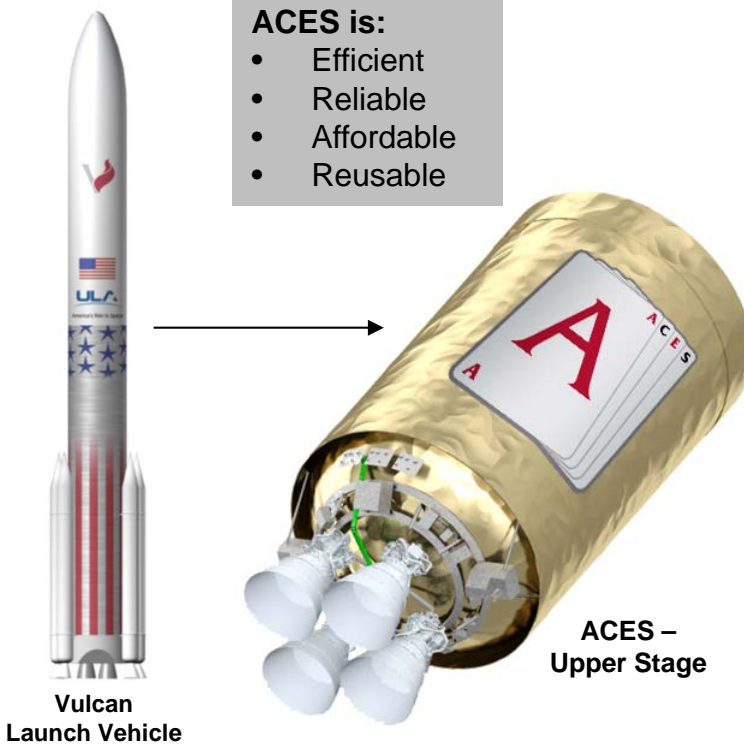


# CISLUNAR TRANSPORTATION SYSTEM

ACES:

Advanced Cryogenic Evolved Stage

➤ Vulcan upper stage reusable in space



**Fueled** with liquid oxygen and liquid hydrogen propellant **provided** from:

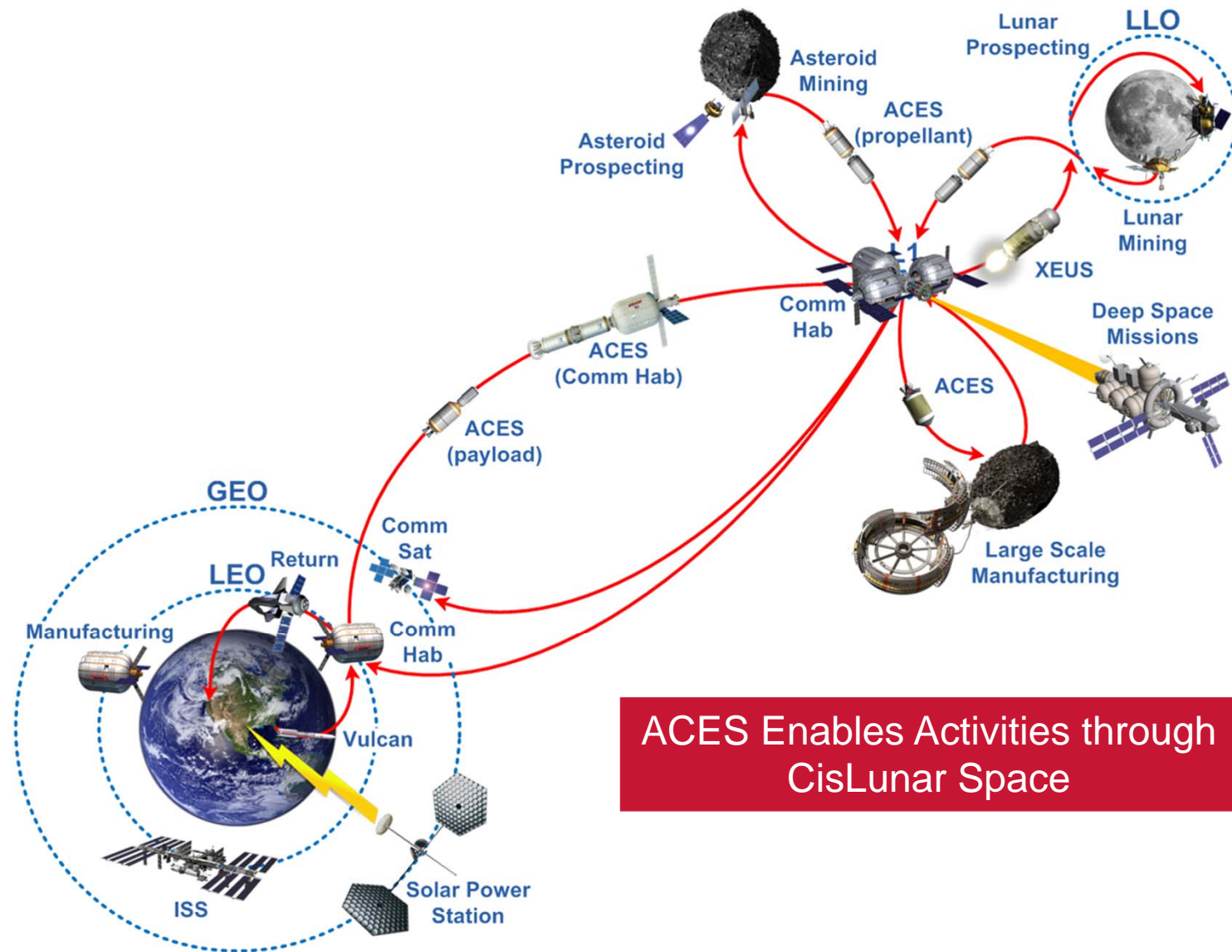
- **Earth**
- **Moon**
- **Asteroids**



ACES is the Revolutionary Foundation Enabling  
Space Transportation that Avoids Earth's Deep Gravity Well



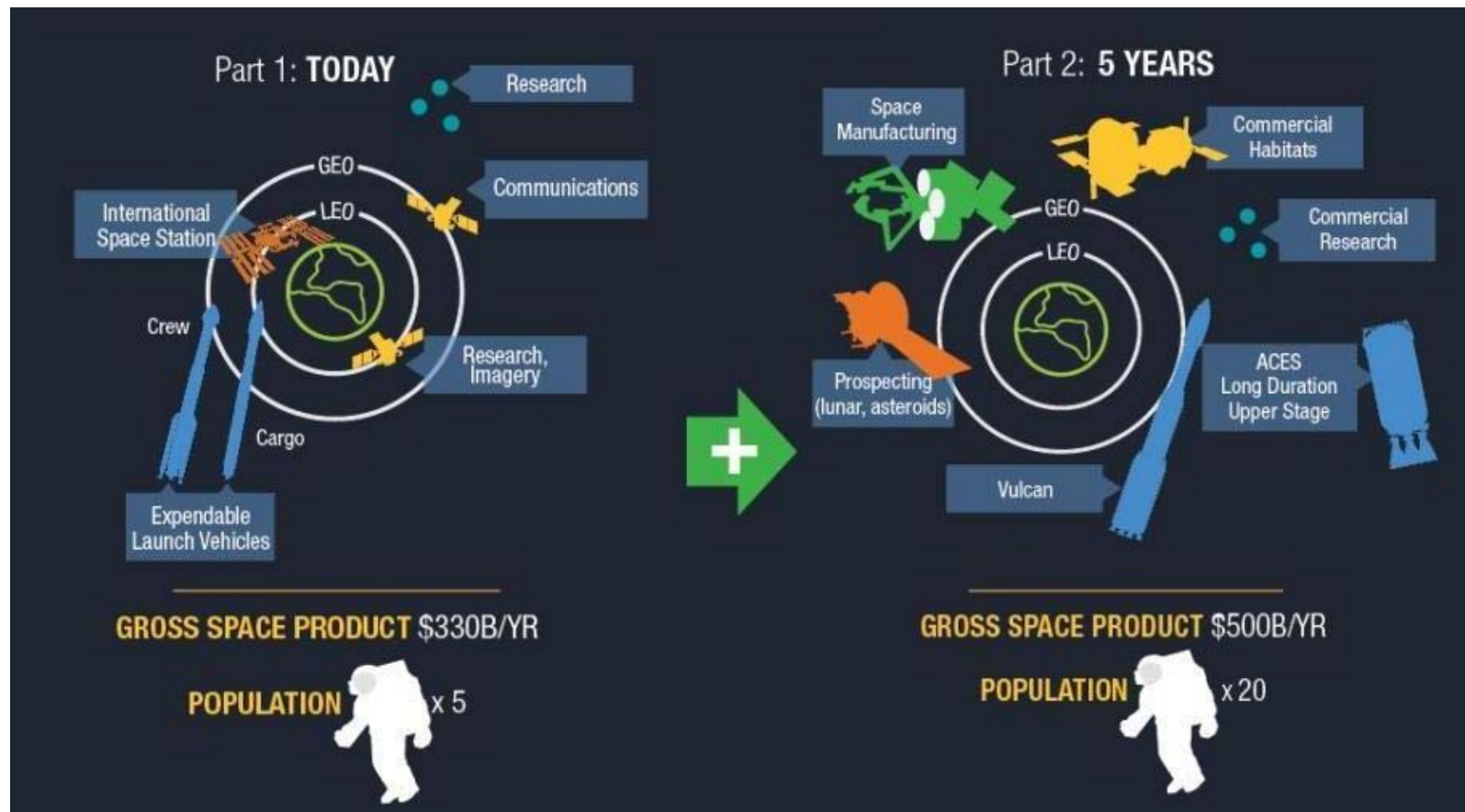
# CISLUNAR ECONOMIC ACTIVITIES



ACES Enables Activities through CisLunar Space

# CISLUNAR-1000<sup>SM</sup> VISION

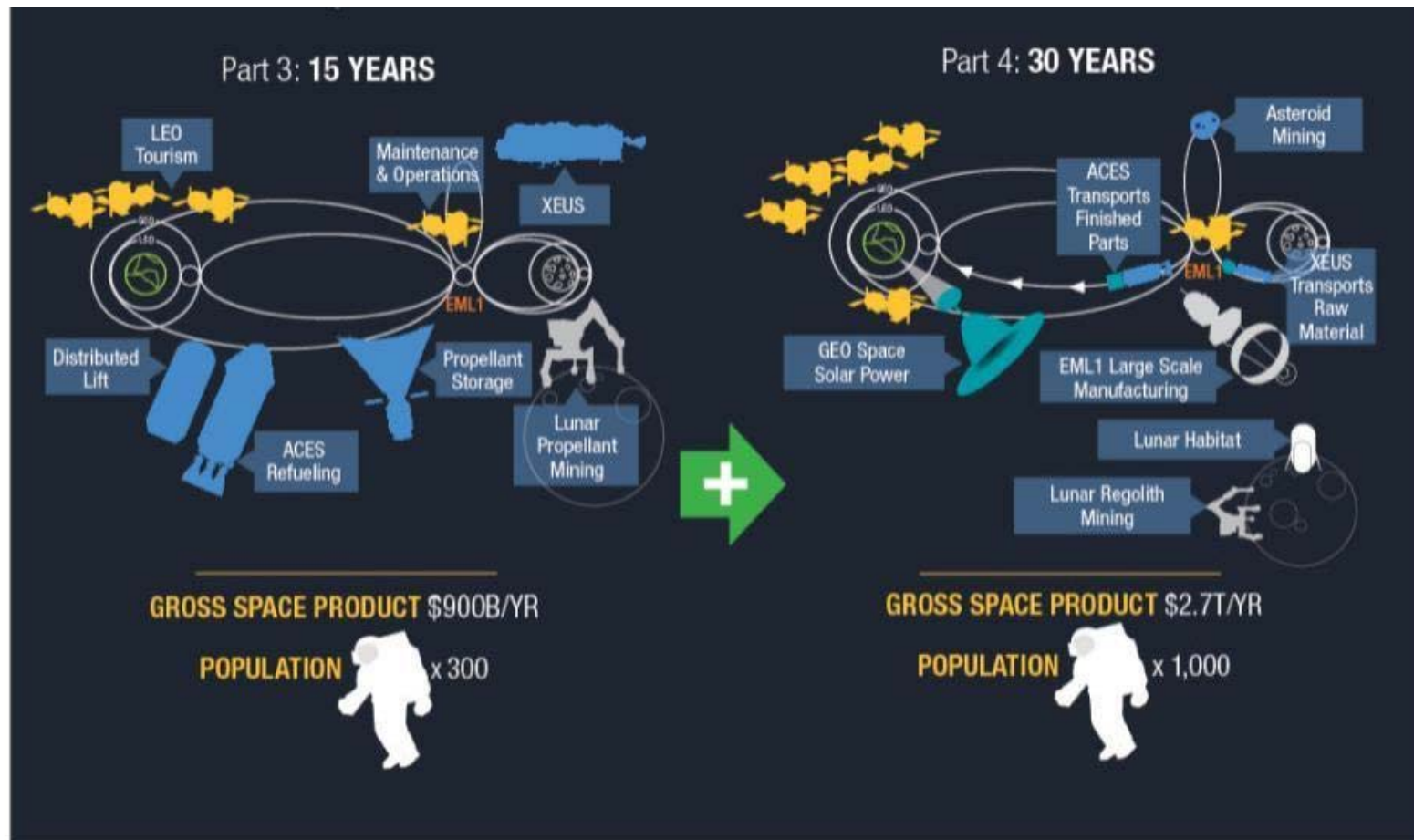
## The First 5 Years





# CISLUNAR-1000<sup>SM</sup> VISION

The Next 25 Years





**America's Ride to Space**