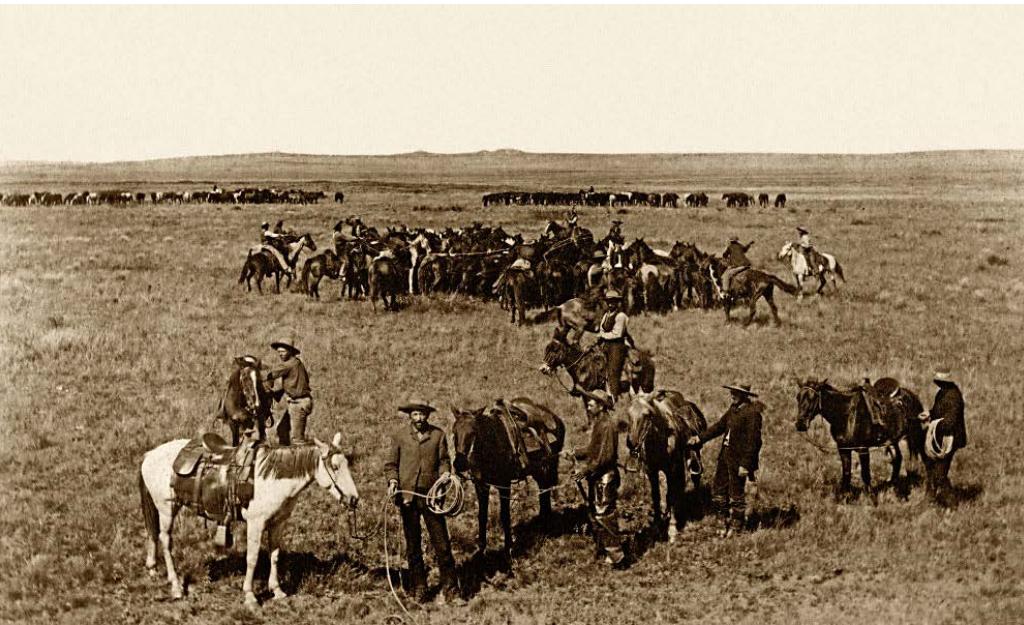
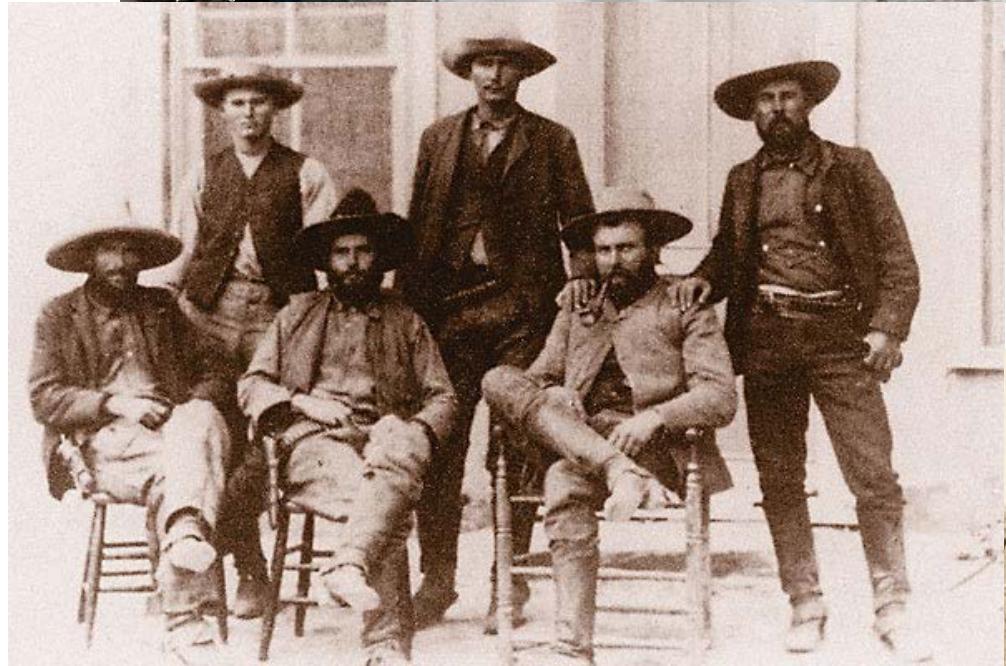






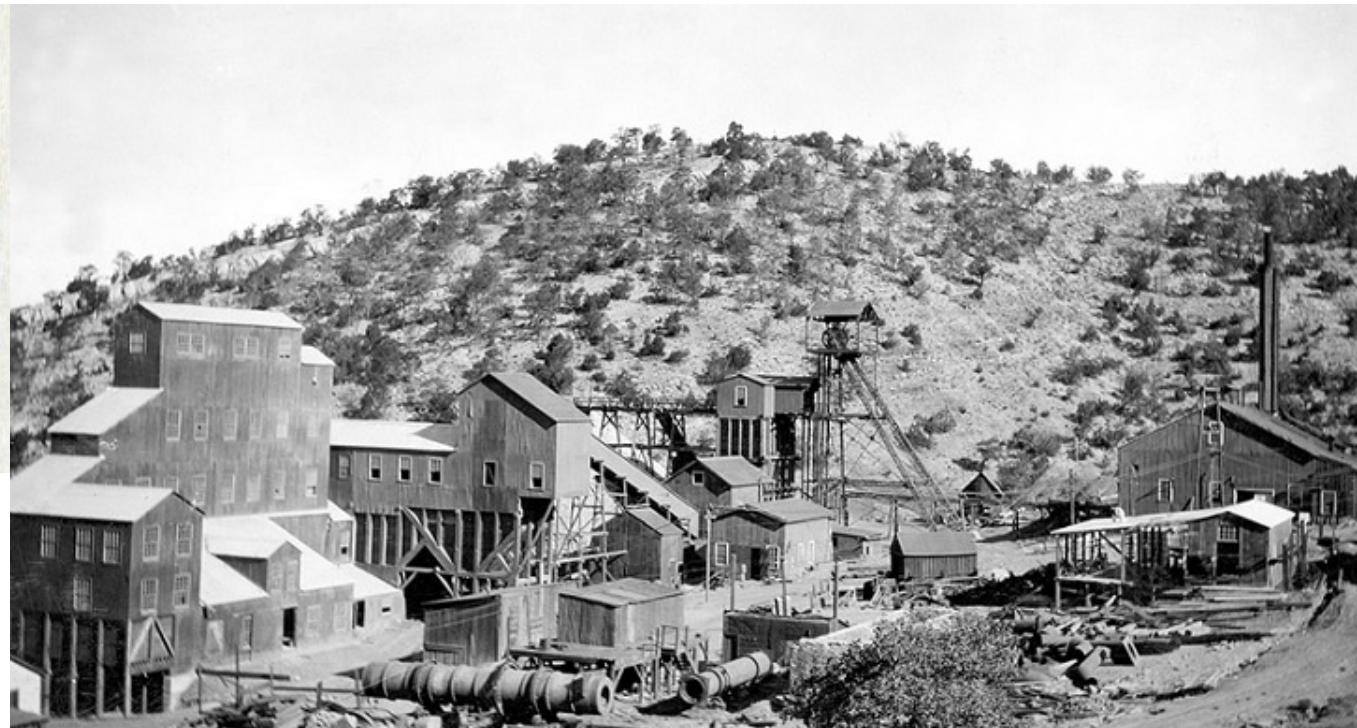
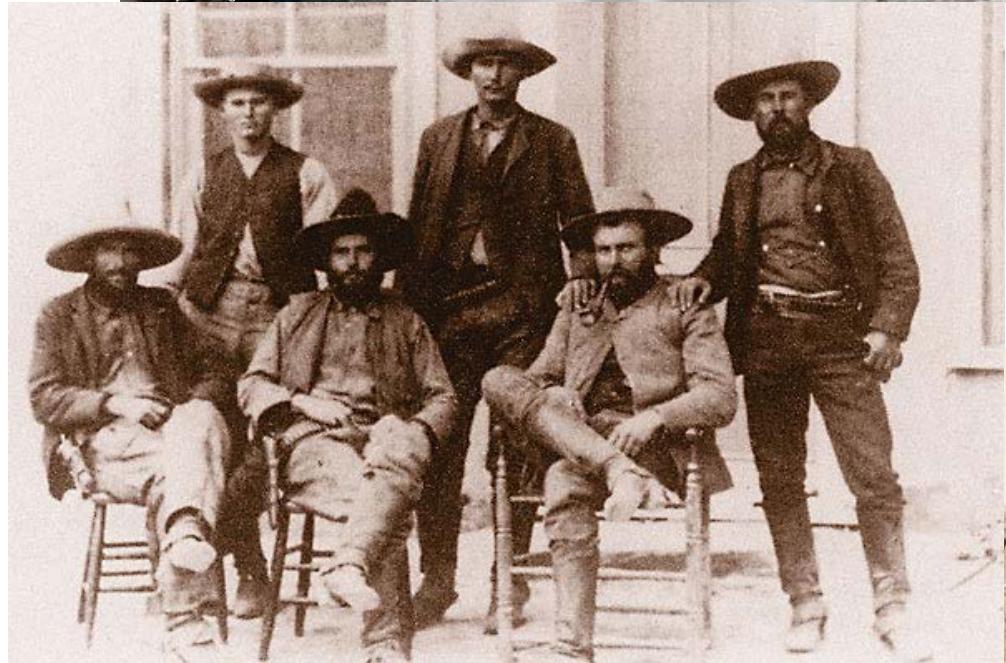


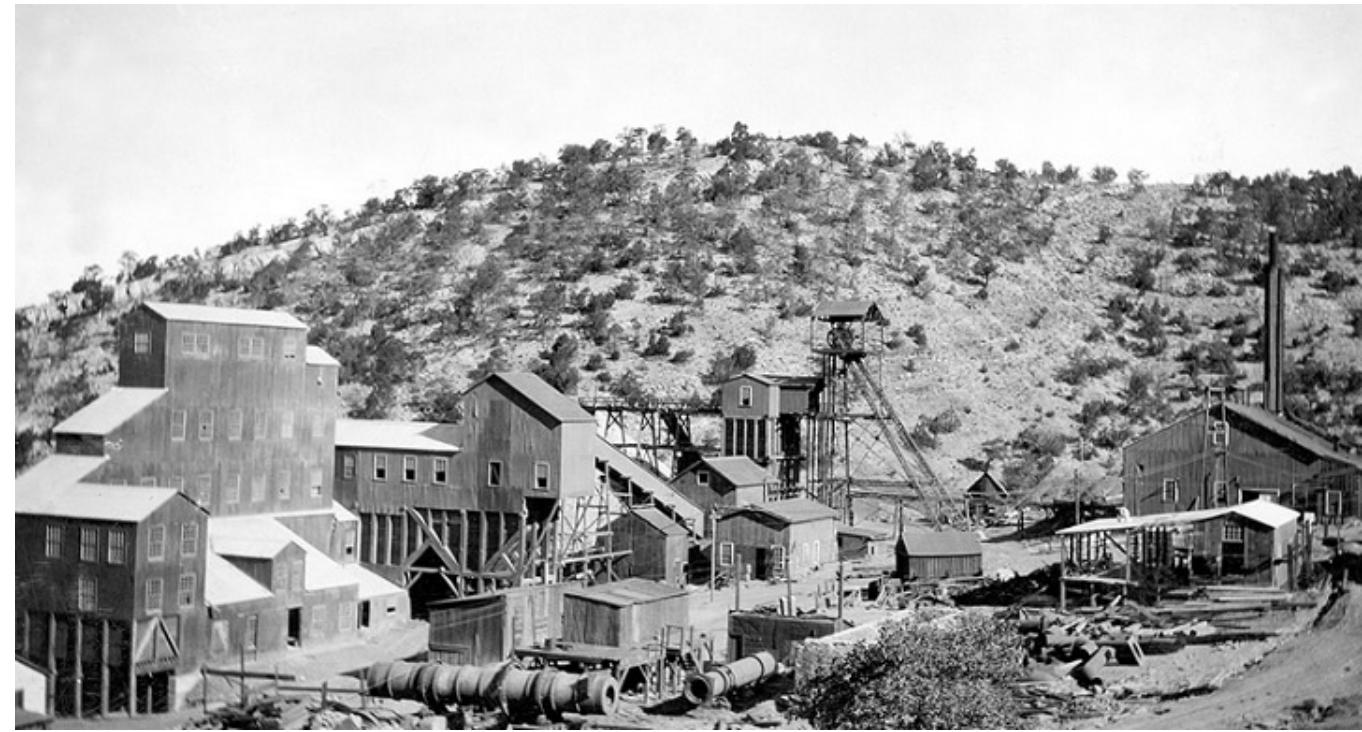
© Library Of Congress





© Library Of Congress

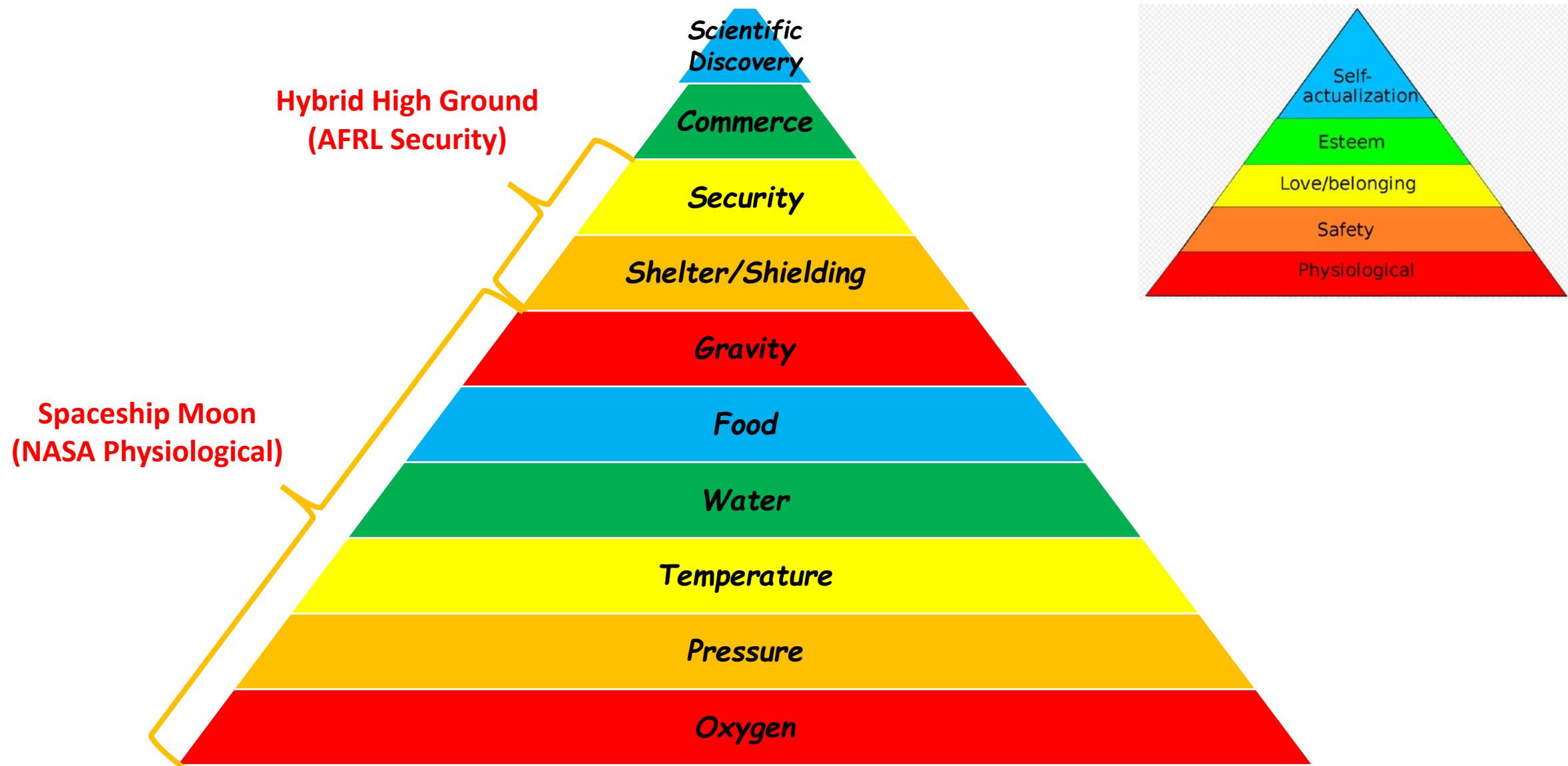






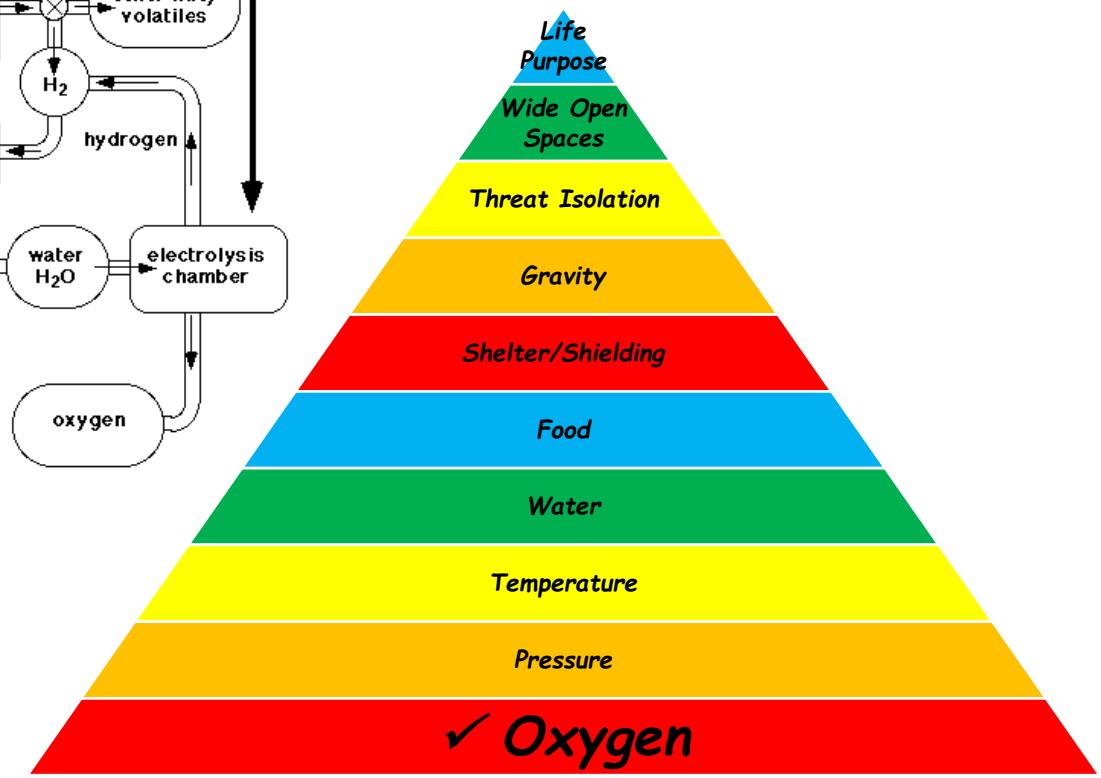
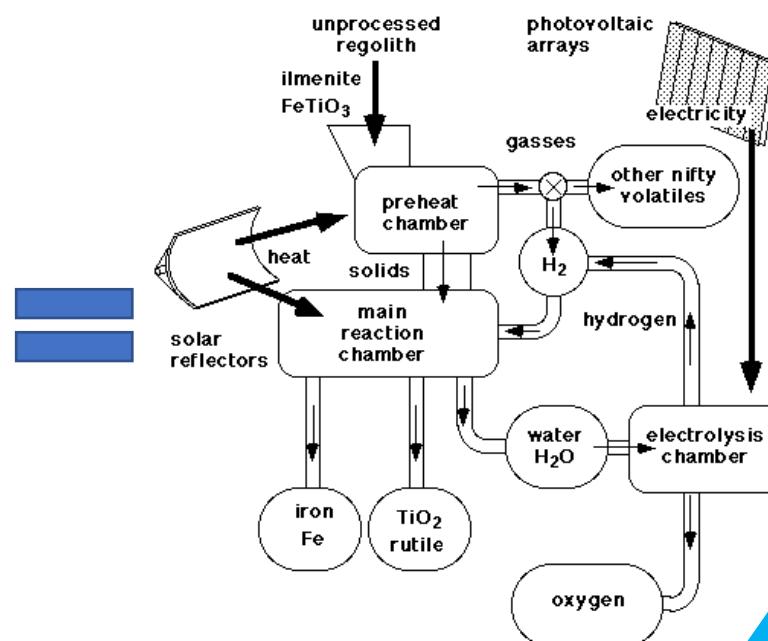
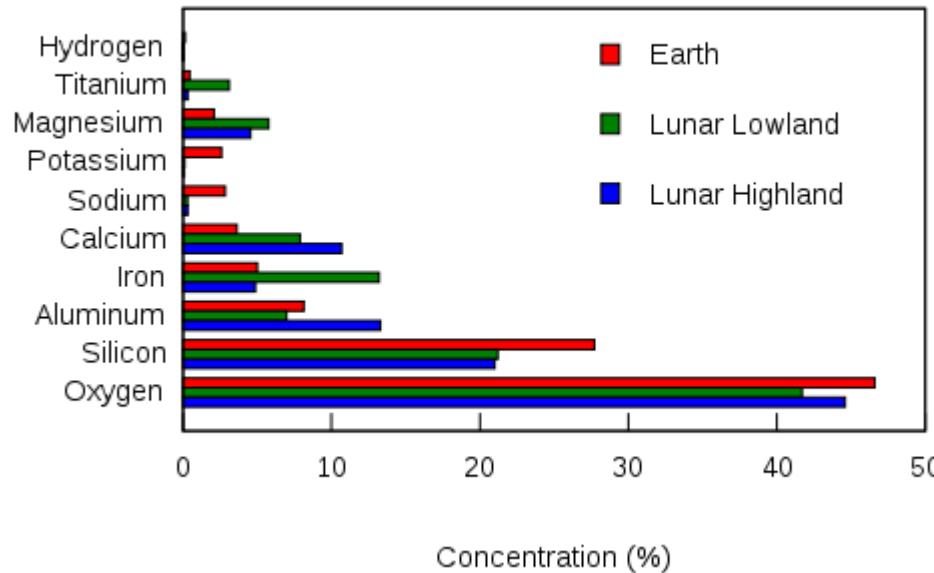
Lunar/Cislunar Maslow's Hierarchy

What will kill you first?



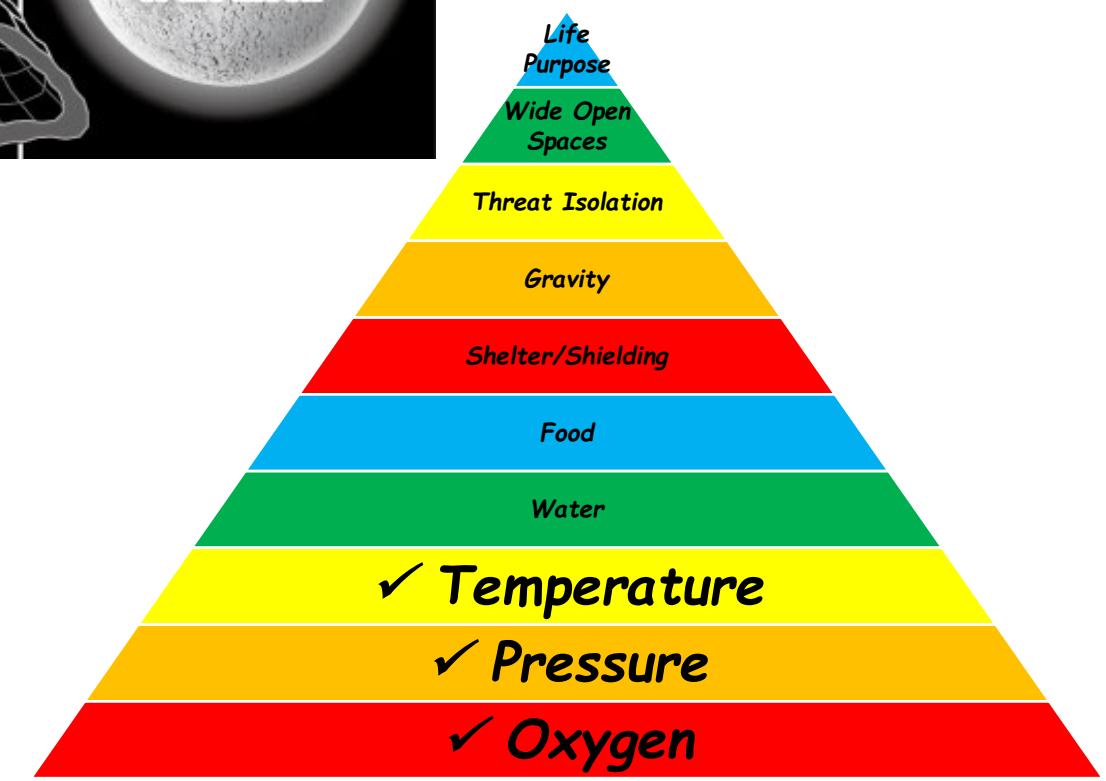
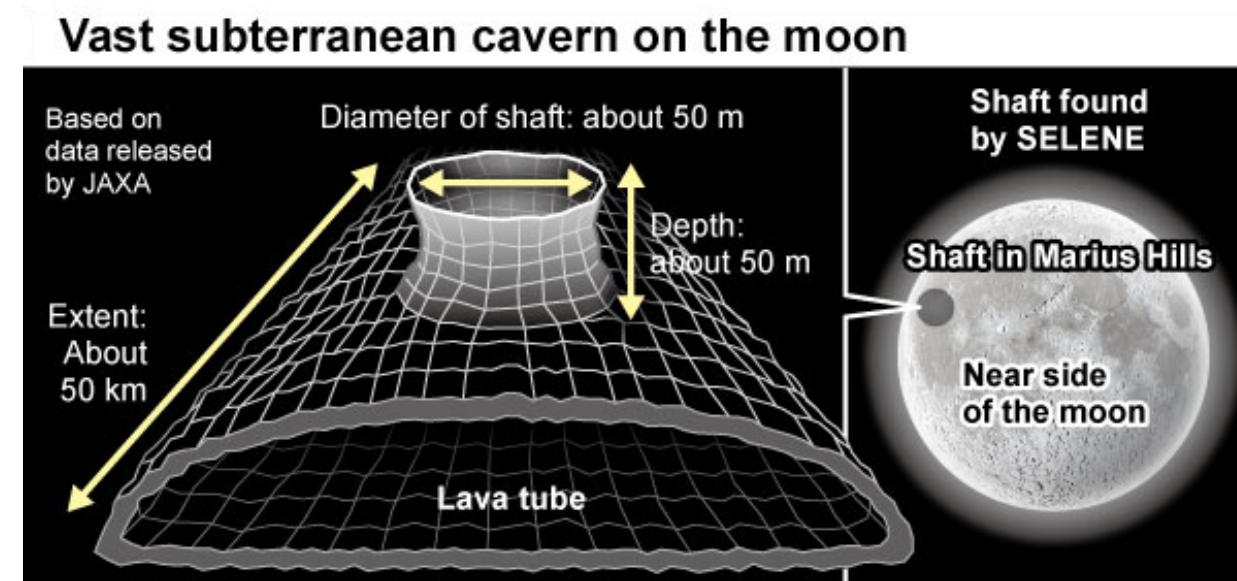
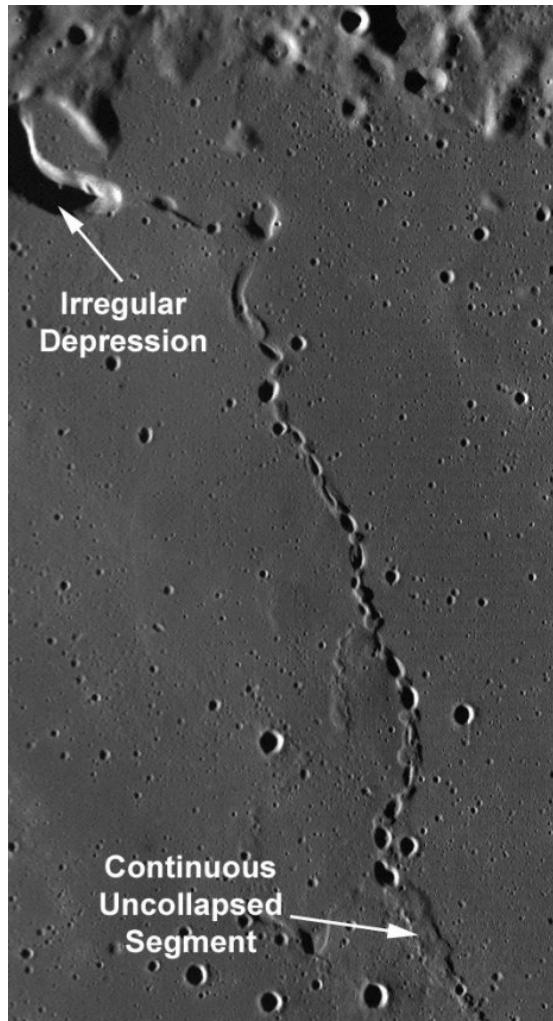
... from seconds to minutes

Concentration of Elements on Lunar Highlands, Lunar Lowlands, and Earth

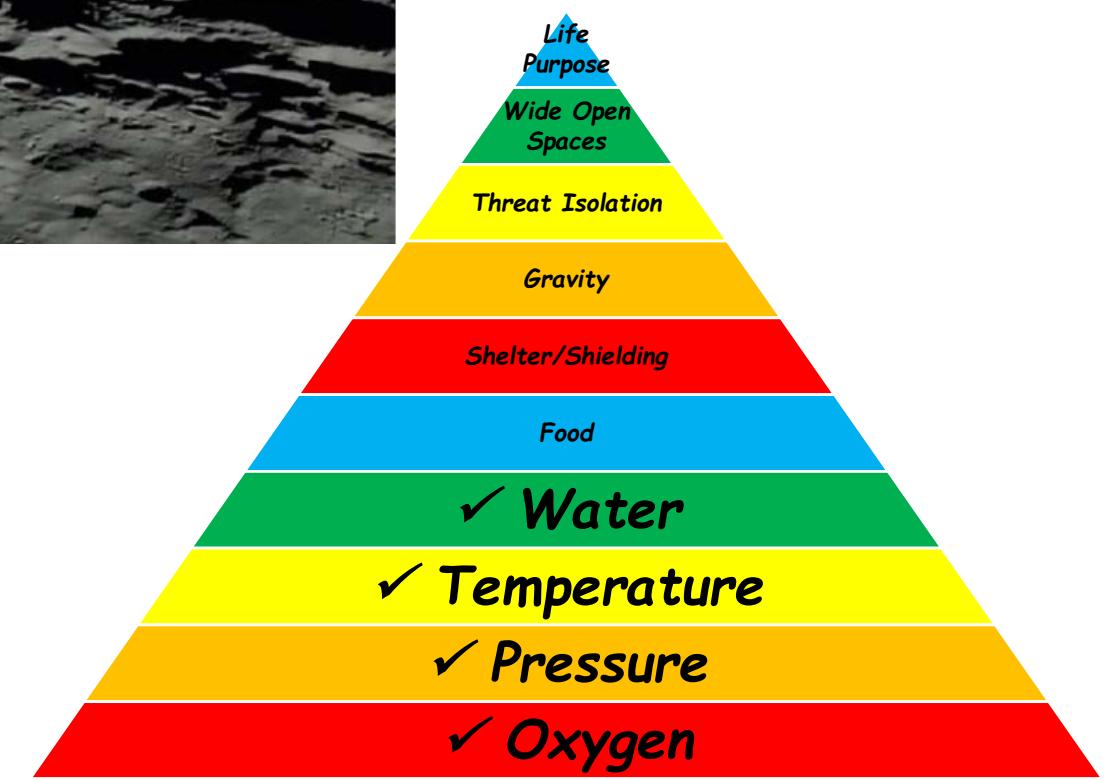
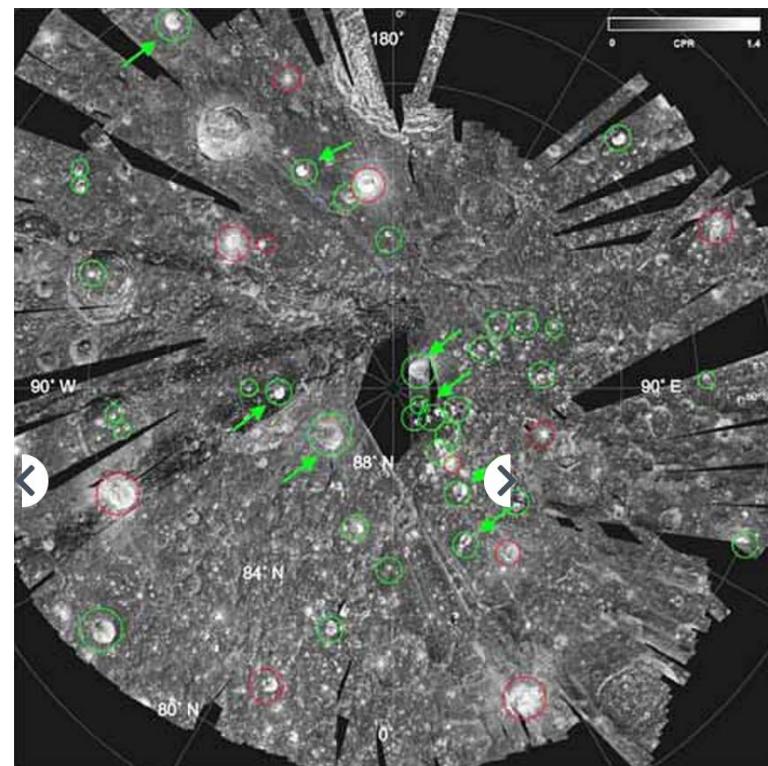




. . . from minutes to hours



... from hours to days





. . . from days to . . .





How can we SURVIVE?

	Spaceship Moon (2019)	New Mexico (1000)	Antarctica (1890)	Low Earth Orbit (1998)
Oxygen	×	×	×	✗
Pressure	✗	×	×	✗
Temperature	✗	✗	✗	✗
Water	×	✗	×	✗
Food	✗	✗	✗	✗
Shelter/Shielding	×	✗	✗	✗
Gravity	✗	×	×	✗
Threat Isolation	×	✗	×	✓
Wide open spaces	×	×	×	✗
Life Purpose	×	✗	✗	✓

State on day of arrival

History of the American West



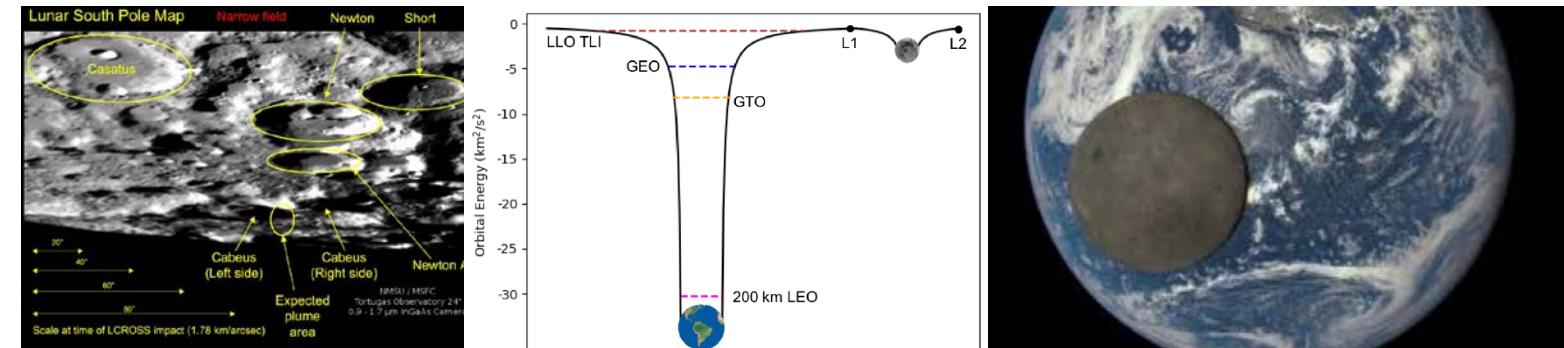
- **1840 SITREP**

- Limited operational control over vast swaths of its Western territory
- Increasingly acknowledged (poorly-understood) value
- Raw materials to support civilization
- Contested

- **How did the US achieve “control” over its adversaries?**

1. Superior awareness
2. Superior communications, “precision” navigation and timing
3. Superior logistics
4. Control of power generation and distribution

National Security for the Lunar/Cislunar Domain



The Moon is by far the most capable satellite of the Earth!

- **2019 SITREP**

- Limited operational control in cislunar space
 - Increasingly acknowledged (poorly-understood) value
 - Civil/Commercial/Near-Peer
 - Raw materials to support civilization
 - Contestable
- **How should the US achieve “control” over its Domain?**
 1. Superior awareness of the cislunar orbital and surface domain (Remote and/or proximity sensing)
 2. Superior communications, precision navigation, and timing of the cislunar orbital and surface domain (Local and backhaul)
 3. Superior logistics (Digital and material)
 4. Control of power production and distribution for the lunar surface
 5. Natural shelter identification and preparation for the lunar surface

President Donald Trump, Space Directive 1

"Lead an innovative and sustainable program of exploration... the United States will lead the return of humans to the Moon for long-term exploration and utilization."

NASA Deputy Administrator

*"Where there are resources, **they must be defended.**"*

CIVIL

WORLD'S LARGEST GDP

National
Security

COMMERCIAL

WORLD'S MOST VALUABLE
COMPANY

Jeff Bezos, Amazon CEO

"We are going to build a road to space," Mr. Bezos said. "And then amazing things will happen."

NEAR-PEER INTERNATIONAL

WORLD'S LARGEST COUNTRY

WORLD'S LARGEST ENGLISH-SPEAKING COUNTRY

LtGen Zhang Yulin

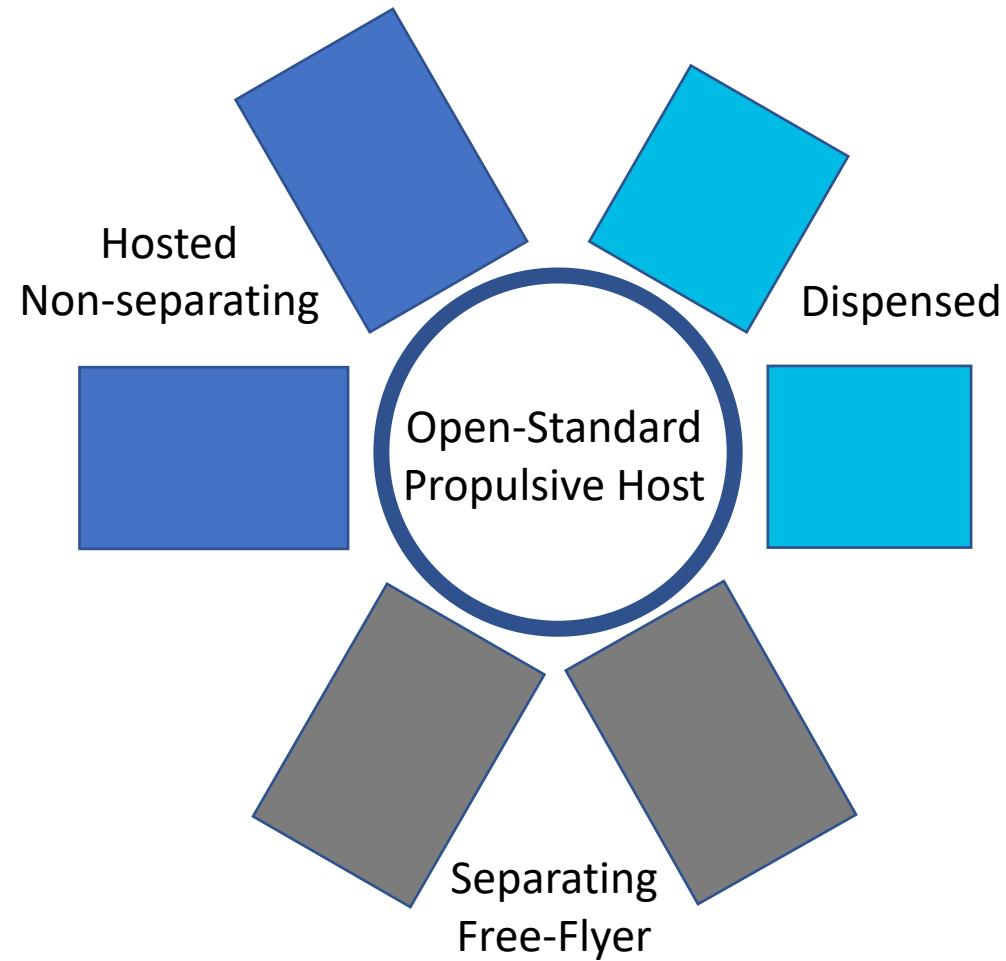
"The earth-moon space will be strategically important for the great rejuvenation of the Chinese nation."

Narendra Modi, Indian Prime Minister

"India has started to make decisions that will make that country a major space power."

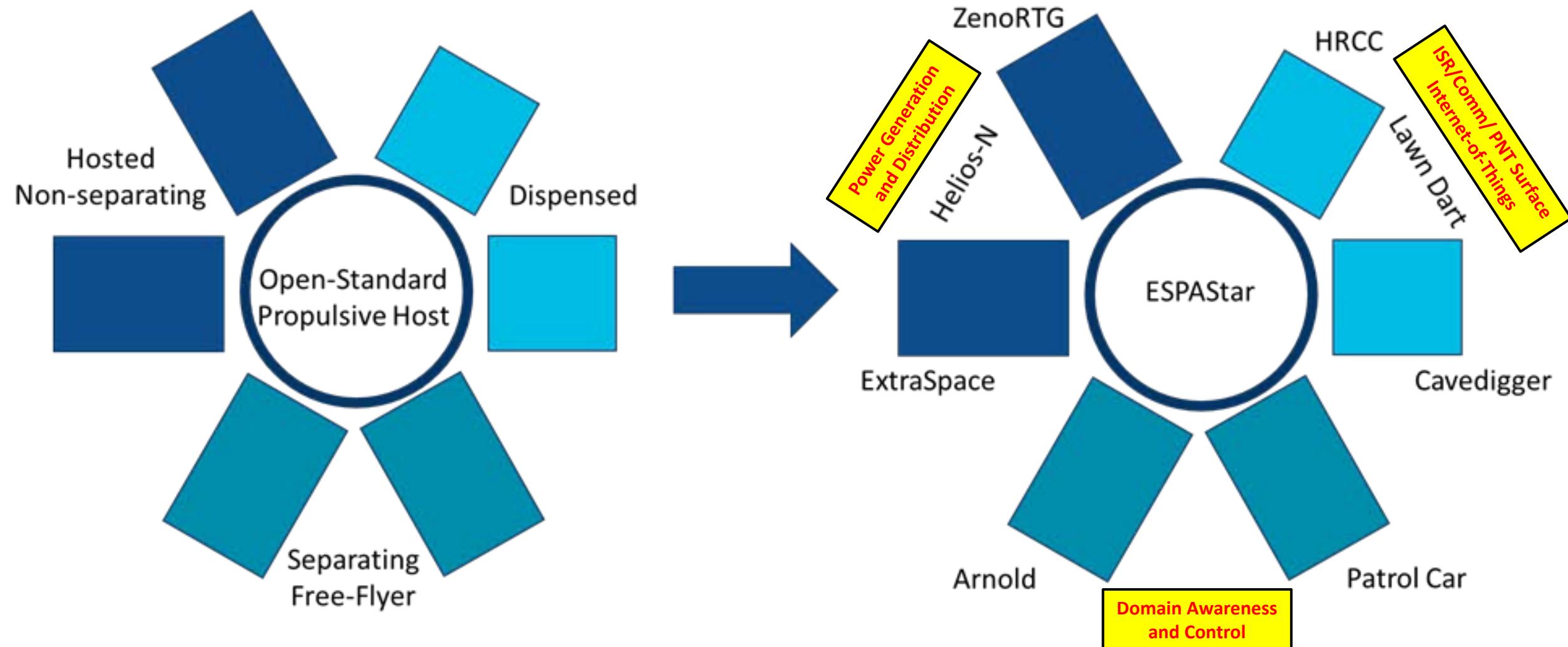
After becoming the 4th country to shoot down a satellite with a missile, NASA administrator responded, "Unacceptable! Potential harm to ISS."

Putting “security things” in a “demonstration-friendly” environment



In 2024 ... On the Lunar South Pole ...
What would make you feel more secure?

Maslow Manifest for LOBO-1



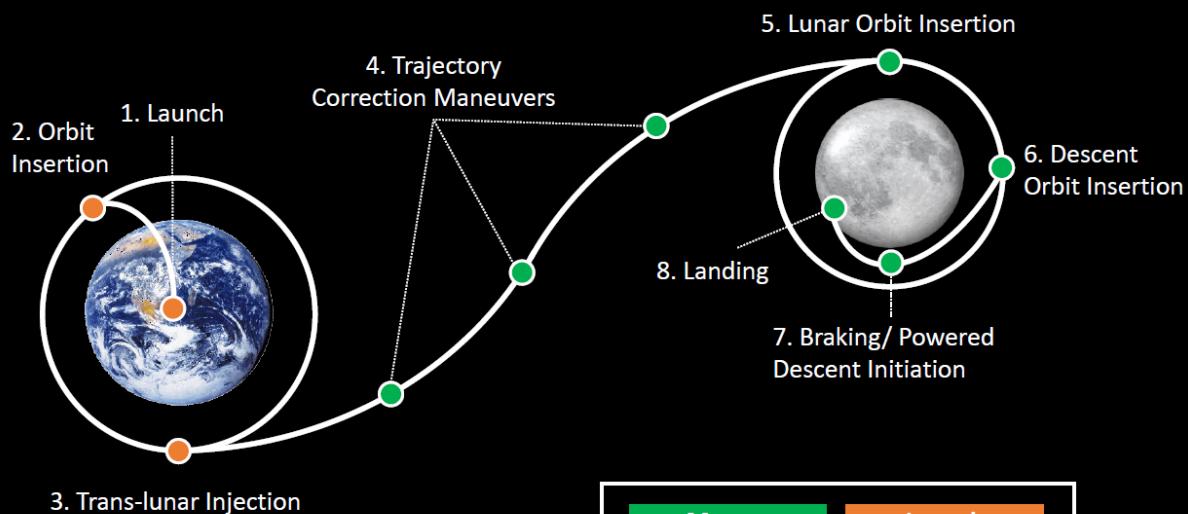


Lawn Darts

For primary missions, Masten's technology addresses the lunar transit and descent phases of lunar transportation



XL-1 Lunar Transportation CONOPS



Regolith Penetrator



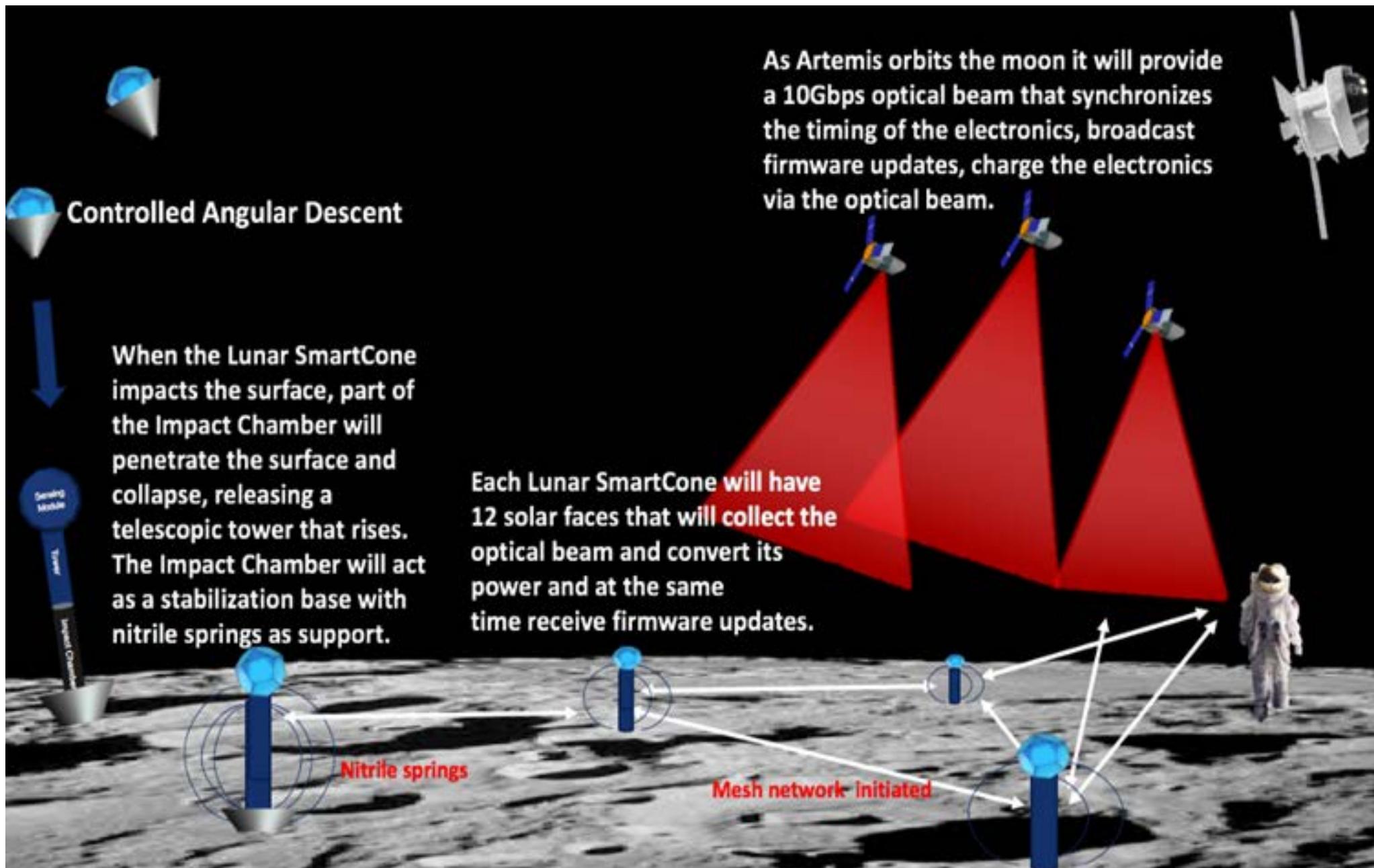
Bobbin-Wound Line Array

"Beach Ball" Sensor Surround

The SmartCone



The Lunar SmartCone



Criteria A: Technical Merit

Deep Technology Heritage	<ul style="list-style-type: none">Leidos has developed and tested end-to-end, aerial deployed, shock hardened electronic sensors demonstrating initial technology feasibility	 Leidos Penetrator
Leader In Emerging Lunar Market	<ul style="list-style-type: none">Masten has matured its lunar lander design from \$20M+ of NASA/ internal investmentMasten is embedded in the lunar science/ tech community; positioned on NASA \$2.6B IDIQ CLPS contract for lunar delivery	 Masten XL-1 Lander
PNT Sensor Maturation Experience	<ul style="list-style-type: none">Masten has led interplanetary PNT technology development for over 10 yearsPNT systems that Masten has tested were subsequently infused NASA Mars 2020 lander and CLPS lunar landers vehicles	 Masten Flying PNT Sensors

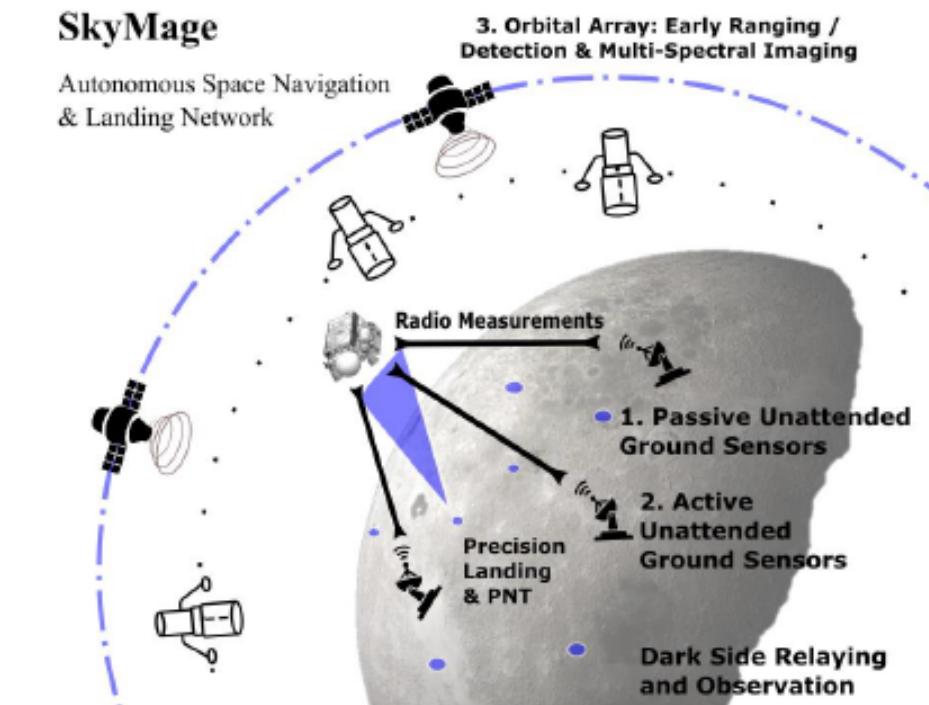
Technology

SkyMage Overview

1. **Passive Unattended Ground Sensors (UGS)** mark keep-out zones or cleared landing zones for lunar landers
2. **Active UGS** are discrete nodes providing precise PNT data to lunar landers
3. **Orbital Arrays** support SDA capabilities and enhance data resolution of ground sensors

SkyMage

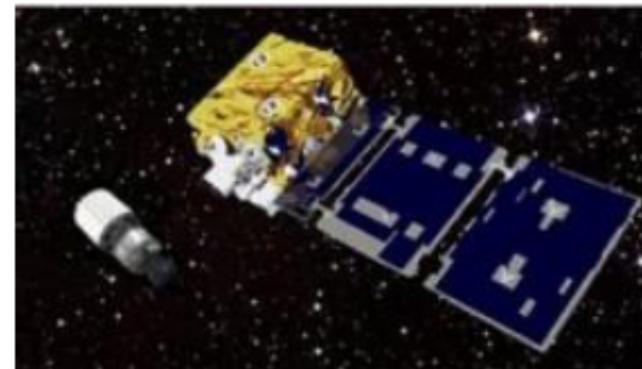
Autonomous Space Navigation & Landing Network



Development History



SkyMage Unattended Ground Sensors based on Leidos's air-delivered sensor dart (TRL 7)



Orbital Array based on Leidos's ANGEL sensor payload (TRL 8)

DON'T FEAR



THE MOON

ONLY 3 DAYS AWAY – PLENTY OF WATER – GRAVITY – WEATHER'S FINE