

Monthly Space News

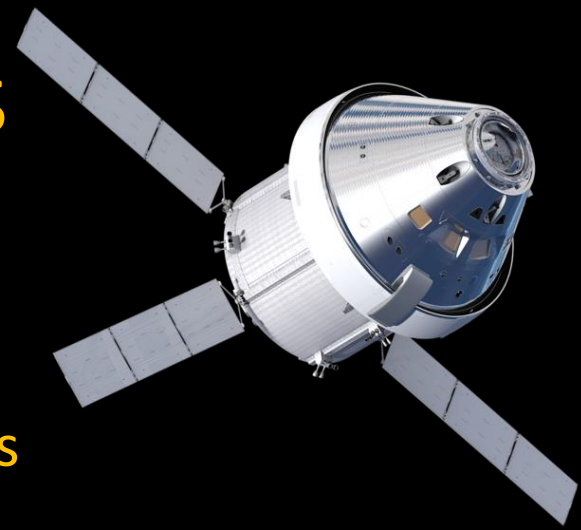
Greg Stanley

Jan. 7, 2023



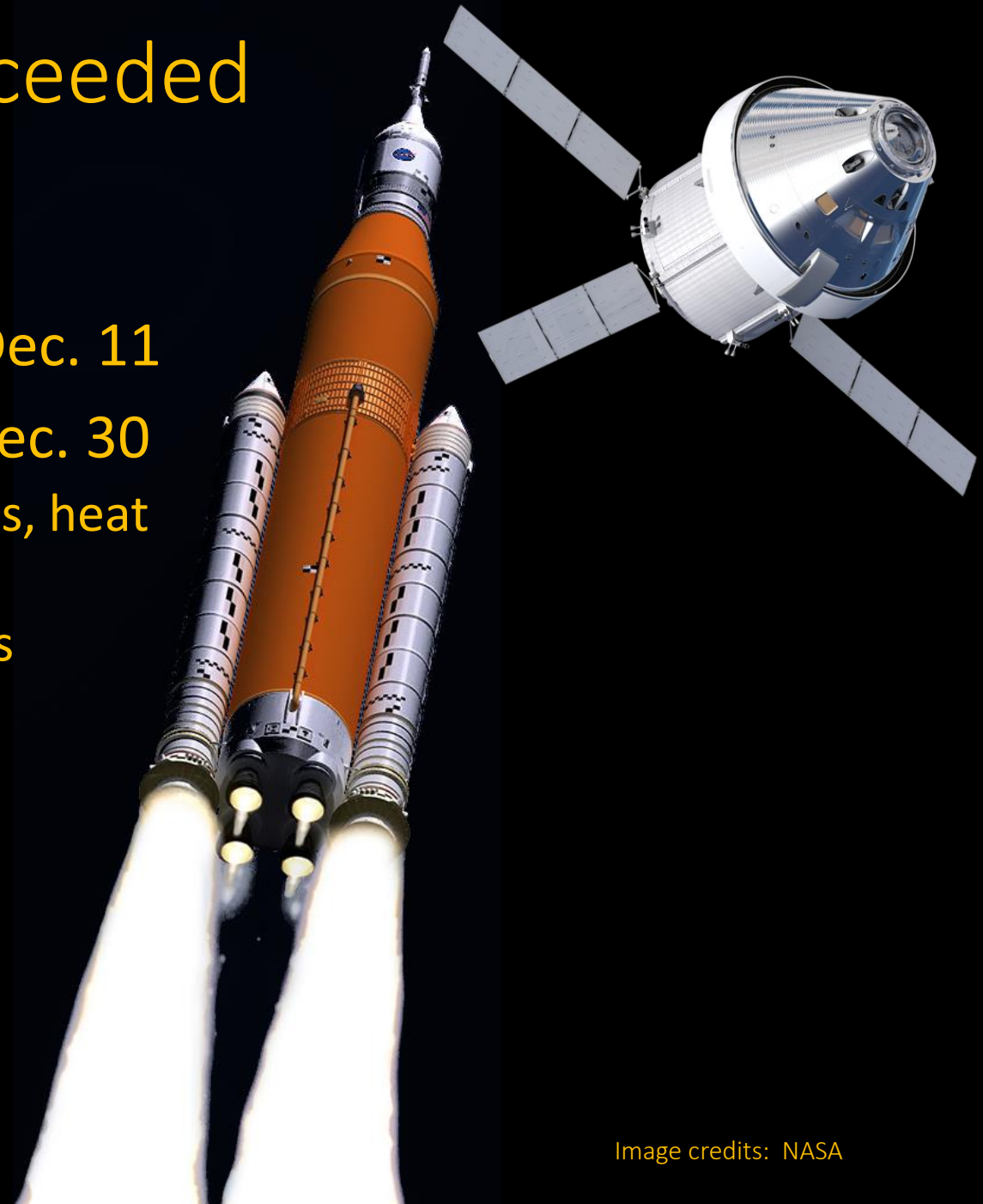
This month's news highlights

- Artemis-1 (Orion and the 10 dwarfs)
 - Artemis 1 return (splashdown) from lunar orbit – success!
 - But 10 small secondary payloads had mixed results
- Other lunar launches and orbital arrivals
- Soyuz leak problem at ISS (space station)
- Recent launches to space
- Year end review



Artemis 1 main mission succeeded

- Artemis 1 launched Nov. 16 to lunar orbit
- Return Orion capsule splashed down on Dec. 11
- Orion trucked to Kennedy Space Center Dec. 30
 - Analysis of every part, including test dummies, heat shield, ...
 - Removing hardware for future Orion capsules
 - Avionics electronics, antennas, ...
 - Crew seat
 - Future Orion missions will re-use more



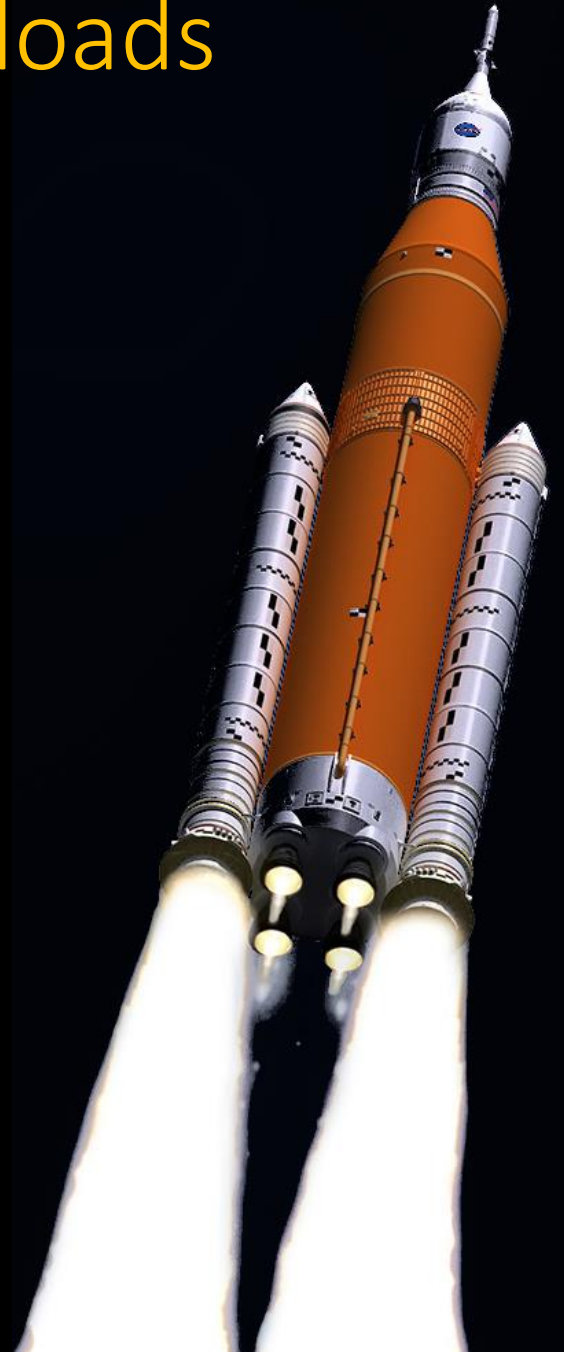
But secondary cubesat payloads had mixed results

- Problems were feared due to long Artemis 1 delays
 - Only 4 of the cubesat rideshares could be recharged
- 4-6 of 10 cubesat “rideshares” failed or partly failed
 - NASA’s Near Earth Asteroid Scout (solar sail) never contacted
 - 31 lb. JAXA (Japanese) lunar lander OMOTENASHI never contacted
 - Miles Space’s Team Miles (plasma thruster test) never contacted
 - LunIR sent only a weak signal (infrared spectroscopy, temperatures)
 - CuSP tracking space weather (solar particles, magnetic fields, ...)
 - OK at first, then battery problems, reboots, loss of contact, still trying recontact
 - LunaH-Map (Lunar Polar Hydrogen Mapper to detect ice) OK, but...
 - Propulsion system to get to correct polar orbit not working yet
 - If heating a stuck valve works, could arrive in 2024
 - Stuck valve may have been result of long delays also



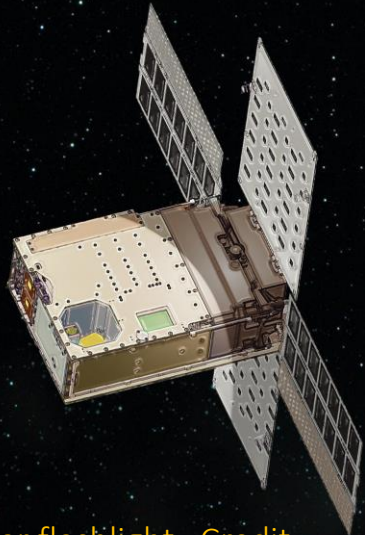
Operational Artemis-1 secondary payloads

- JAXA's EQUULEUS scanning radiation, plasma
- BioSentinel (deep space radiation effects on yeast)
- ESA's ArgoMoon (camera observing Orion, future solar orbit)
- Lunar IceCube (water ice prospector)



Other lunar activities

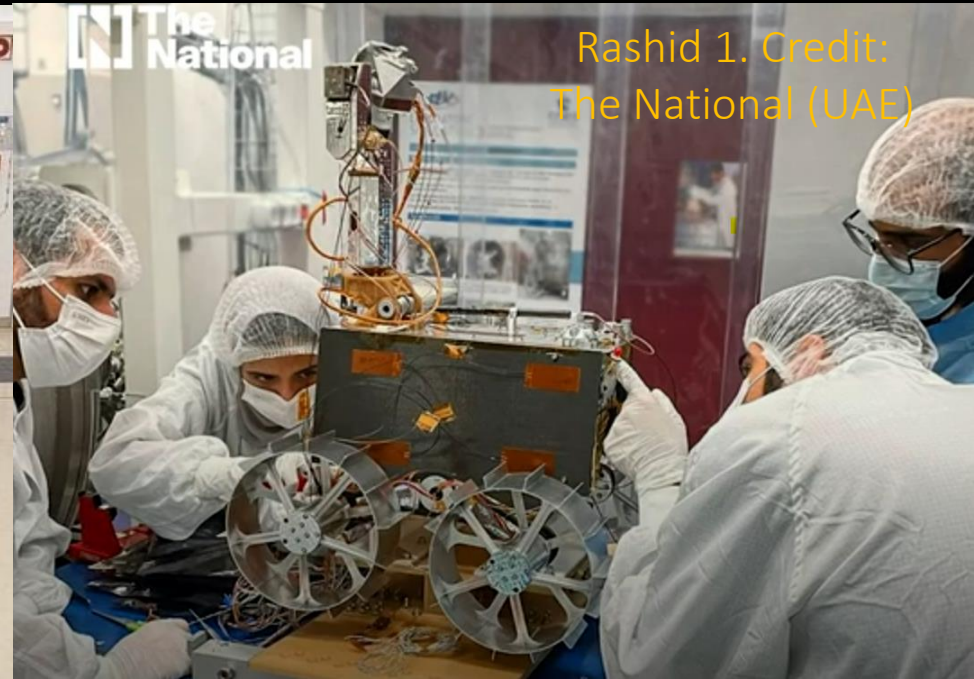
- South Korea's first lunar orbiter launched Aug. 4 on a Falcon 9, arrived Dec. 16
- Falcon 9 launch Dec 11
 - NASA's Lunar Flashlight (A 6U cubesat, briefcase-sized)
 - Surveying water ice in craters with infrared lasers, supporting future ISRU (In Situ Resource Utilization)
 - Uses improved ASCENT monopropellant to replace hydrazine
 - Hakuto-R Mission 1 lunar lander (Japan)
 - First private lunar lander (ispace, Japan)
 - UAE Rashid-1 rover, other small payloads



Lunar flashlight. Credit: NASA



M1 lander. Credit: ispace



Rashid 1. Credit: The National (UAE)

Soyuz leak problem at ISS Dec. 14

- Coolant leaked on a docked Soyuz crew capsule
 - The return vehicle for astronauts, scheduled or emergency
- Unclear if capsule could safely return with astronauts
 - If not, it would be released and a new automated Soyuz would dock



LIVE

Image: from NASA TV

RAW

How many launches since the last meeting (Dec. 10)?

*Includes failed launches if they lift off the launch pad
Only includes launches attempting Earth orbit or beyond*

Last launch of 2022
ISI EROS C-3 launch (Falcon 9)
Dec. 30, 2022
Credit: SpaceX webcast video



LIFTOFF

Launches since last meeting (Dec. 10), page 1



Dec 11 – Falcon 9 – ispace Hakuto-R M1 lunar lander, NASA lunar flashlight



Dec 12 – Long March 4C – Shiyang-20A & 20B Earth observation satellites



Dec 13 – Ariane 5 – Galaxy 35 & 36 TV broadcast satellites, MTG-I1 weather satellite



Dec 14 – Zhuque-2 – first methalox (methane/liquid O₂) orbit attempt), (2nd stg. FAIL)



Dec 14 – Long March 2D – 3 Yaogan-36 military reconnaissance satellites



Dec 16 – Long March 11 – Shiyang-21 Earth observation satellite



Dec 16 – Falcon 9 – SWOT (Surface Water & Ocean Topography) US/French satellite



Dec 16 – Falcon 9 – O3b mPower-1 communications satellite (MEO constellation by SES)



Dec 17 – Falcon 9 – 54 Starlink internet satellites (3,612 launched)



Dec 20 – Vega C – Pleiades-Neo 5 & 6 Earth observation satellites (FAIL)



Dec 27 – Long March 4B – another Gaofen-11 Earth observation satellite



Dec 28 – Falcon 9 – 54 Starlink satellites (Gen 2 orbits, V1.5 or V2 mini satellites?)



Dec 28 – Long March 3B – Shiyang-10-2 classified satellite



Monthly space news 2022 Year end review

(Separate presentation)

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Discussion & questions?



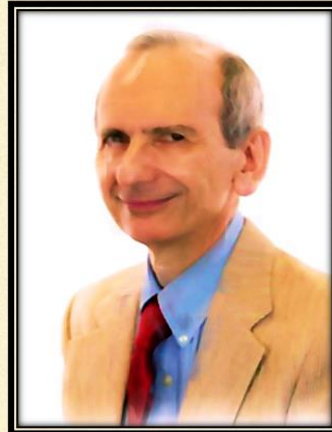
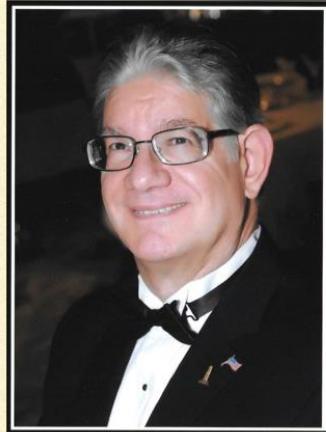
Image: NASA

Featured speakers: John Dilorio & Vito Manfredi

New Space Ventures for America's Spaceports

The learning objectives for this tutorial are:

- ▶ USA Spaceports 2022 map
- ▶ The Tenants at Spaceport America
- ▶ The Tenants at the Houston Spaceport
- ▶ A brief explanation of a Space Cruise Ship Design
- ▶ Engineering Teams you may be Interested in joining.



- John Dilorio
 - Owner, Planet Forbidden Pictures
 - Extensive engineering experience with Defense Department
 - Bachelor in Mechanical Engineering at University of Minnesota, Army Management Engineering College
- Vito Manfredi
 - Owner, VRM Graphic Design
 - Graphic designer
 - Marketing & Sales at National Oilwell Varco, Texas Tools Marketing
 - Bachelor of Arts in Radio-TV

