

BEYOND EARTH

MONTHLY



THE NEW MARTIAN!

“ We’re going to be able to get to places the scientists want to go much more quickly. ”

WHAT’S ALL THE BUZZ!

Will the second Man on the moon go back for a second round?

AMATEUR TIME TRAVELERS

Stargazing means serious business for your neighbors!

2024
JAN
4 ISSUE 01



HORSEHEAD NEBULA
By Carlos Navas

GREETINGS!



Thank you for taking interest in this magazine mock-up where several of my passions collide. Growing up, 3 things were certain. I love design, space and many forms of educational literature. I was the type of kid that would look through encyclopedias, and read National Geographic over and over again. I was fascinated by informative illustrations, the balance of typography, and the wonderful stories covered by hundreds of writers, editors, illustrators, and photographers.

This magazine embodies many types of skills that I can offer. Whether the task is creative or persuasive writing, informative illustration, or layout design. I can offer your company a wide range of printable and digital solutions ranging from news letters, email blasts, brochures, banners, web assets, stationary and forms. I hope you enjoy my designs as I have, putting it all together.

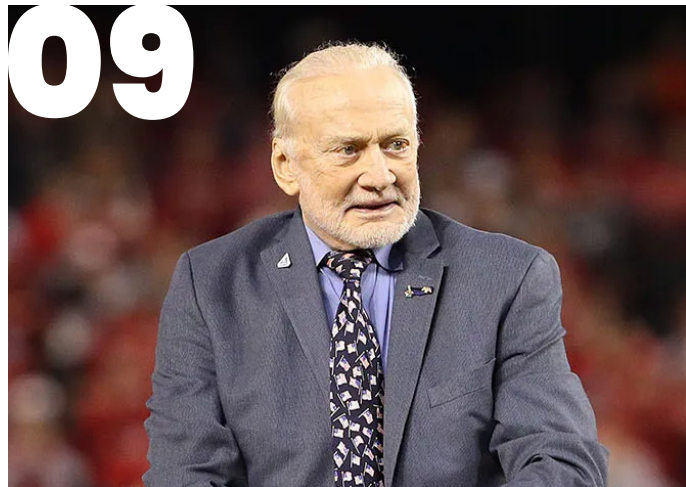
LUZ ANGEL LOPEZ
Writer & Creator

WHAT'S NEW?

03 THE NEW MARTIAN

Perseverance is the latest addition to the rover family. It is a step closer to possibly finding life on Mars.

09



07 AMATEUR TIME TRAVELERS

Not scientists, not astronomers, just your average neighbors gazing up at the stars millions of light years away.

09 MILLION DOLLAR SUITS

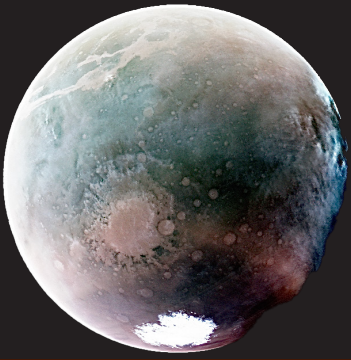
See what companies are competing for the latest and greatest space suits. Mars, space walks, ISS, and launches all need new space suits.

08



10 THE FINAL FRONTIER

Take a look at the future of space, what's to happen with the ISS? Artemis, moon, mars and more!



PERSEVERANCE

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PERSEVERANCE: The Facts!

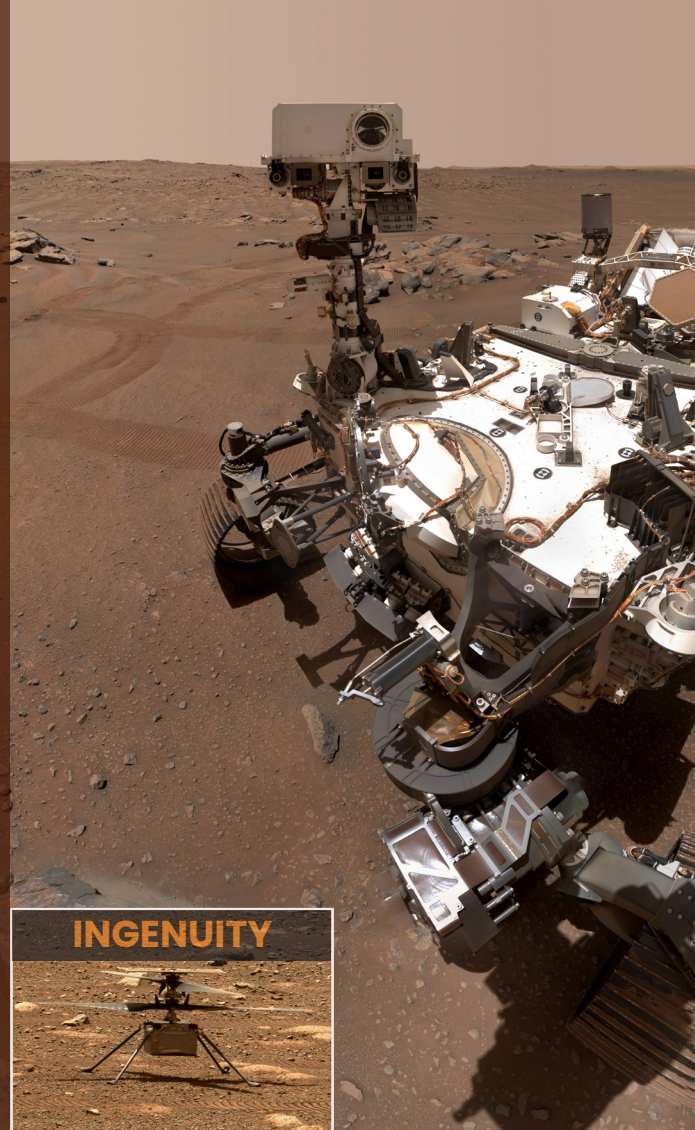
- Mission Name:** Mars 2020
- Rover Name:** Perseverance
- Launch:** July 30, 2020
- Landing:** Feb. 18, 2021, Jezero Crater, Mars

Main Job

Seek signs of ancient life and collect samples of rock and regolith (broken rock and soil) for possible return to Earth.

Helicopter “Ingenuity”

The Mars Helicopter completed its 30-day technology demonstration and continues in its operations demo phase.



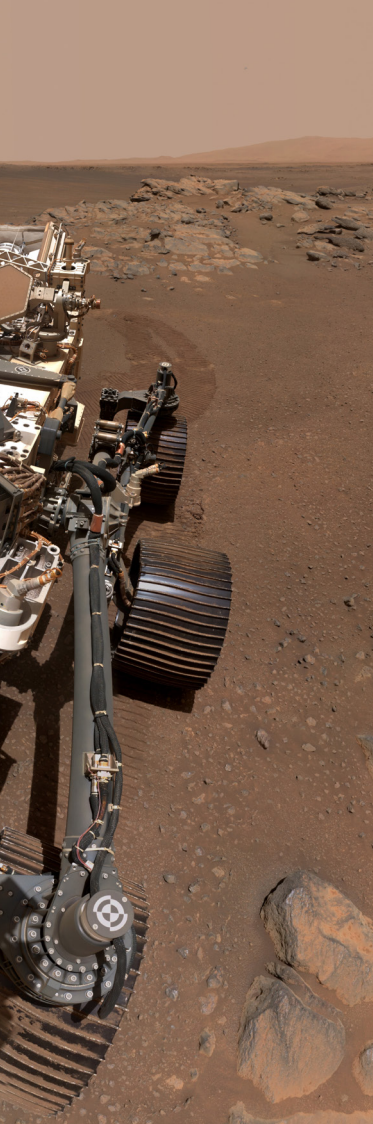
MEET THE NEW MARTIAN!

This is Perseverance the new rover.

Launched July 30, 2020, and landed February 18, 2021 The Perseverance rover is looking for signs of ancient life and is collecting rock and soil samples for a possible return to Earth by a subsequent Mars mission. The rover has a drill to collect core samples of Martian rock and soil, then store them in sealed tubes for pickup by a future mission that would ferry them back to

Earth for detailed analysis. Perseverance will also test technologies to help pave the way for future human exploration of Mars. The Mars helicopter (Ingenuity) was deployed from the Perseverance rover and has performed dozens of test flights, becoming the first powered flight on the red planet.

PERSEVERANCE



MEET THE DRIVERS

A team of engineers work around the clock to plot a course but Perseverance finds its own way around!



The MARS ROVER TEAM celebrating after Perseverance successfully lands on Mars marking the beginning of a new era.

The rover team is deeply engaged with planning navigation routes, drafting instructions to be beamed up, even wearing special 3D glasses to help map their course.

But increasingly, the rover will take charge of the drive by itself, using a powerful auto-navigation system. Called AutoNav, this enhanced system makes 3D maps of the terrain ahead, identifies hazards, and plans a route around any obstacles without additional direction from controllers back on Earth.

“We have a capability called ‘thinking while driving,’” said Vandī Verma, a senior engineer, rover planner, and

driver at NASA’s Jet Propulsion Laboratory in Southern California. “The rover is thinking about the autonomous drive while its wheels are turning.”

That capability, combined with other improvements, might enable Perseverance to hit a top speed of 393 feet (120 meters) per hour; its predecessor, Curiosity, equipped with an earlier version of AutoNav, covers about 66 feet (20 meters) per hour as it climbs Mount Sharp to the southeast.

“We sped up AutoNav by four or five times,” said Michael McHenry, the mobility domain lead and part of JPL’s team of rover planners. “We’re driving a lot farther in a lot less time than Curiosity demonstrated.”

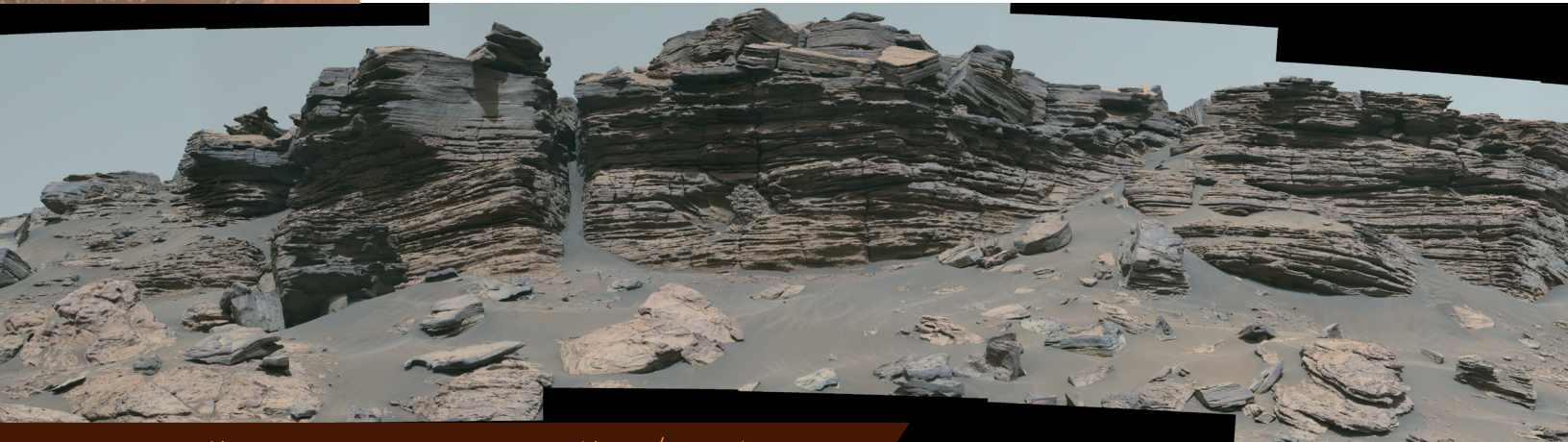
“We’re going to be able to get to places the scientists want to go much more quickly,”

said Jennifer Trosp̄er, who has worked on every one of NASA’s Martian rovers and is the Mars 2020 Perseverance rover project manager.

“Now we are able to drive through these more complex terrains instead of going around them: It’s not something we’ve been able to do before.”



Vandī Verma wearing 3D glasses that are used to see obstacles.



Perseverance used its Mastcam-Z camera to capture this pan/zoom photo of the rocky hilltop nicknamed “Rockytop” on the 507th sol, of the mission.

LIFT OFF!

A timeline of events in our journey to Mars

- 1965** Mariner 4 takes first close-up photos of Mars
- 1971** Mariner 9 becomes first satellite to orbit Mars, USSR Mars lander makes first landing
- 1996** Mars Global Surveyor re-images Mars which revealed signs of water
- 1997** Pathfinder the first robotic rover lands on Mars, discovering signs of past existence water and a thicker atmosphere
- 2001** Mars Odyssey orbiter takes measurements and creates maps of Mars
- 2004** Spirit rover and Opportunity rover both successfully land on Mars
- 2005** Mars Reconnaissance Orbiter takes a detailed view of Mars geography
- 2007** Phoenix Scout lander arrives on Mars to read climate information and weather changes
- 2013** MAVEN orbiter gathers climate information and provides communication support for the rovers
- 2016** Exomars successfully orbits Mars to provide communications assistance with rovers
- 2018** InSight takes seismic readings and studies deep layers of Mars
- 2020** Perseverance lands on Mars in search of microbial life. Mars has first helicopter

NASA's Perseverance Celebrates First Year on Mars by Learning to Run

The rover has racked up a series of accomplishments, including new distance records, as it reaches the end of the first of several planned science campaigns on the Red Planet.

NASA's Perseverance rover has notched up a slew of firsts since touching down on Mars one year ago, on Feb. 18, 2021, and the six-wheeled scientist has other important accomplishments in store as it speeds toward its new destination and a new science campaign.

Weighing roughly 1 ton (1,025 kilograms), Perseverance is the heaviest rover ever to touch down on Mars, returning dramatic video of its landing. The rover collected the first rock core samples from another planet (it's carrying six so far), served as an indispensable base station for Ingenuity, the first helicopter on Mars, and tested MOXIE (Mars Oxygen In-Situ Resource Utilization Experiment), the first prototype oxygen generator on the Red Planet.

Perseverance also recently broke a record for the most distance driven by a Mars rover in a single day, traveling almost 1,050 feet (320 meters) on Feb. 14, 2022, the 351st Martian day, or sol, of the mission. And it performed the entire drive using AutoNav, the self-driving software that allows Perseverance to find its own path around rocks and other obstacles. The rover has nearly wrapped up its first science campaign in Jezero Crater, a location that contained a lake billions of years ago and features some of the oldest rocks Mars scientists have been able to study up close. Rocks that have recorded and preserved environments that once hosted water are prime locations to search for signs of ancient microscopic life. Using a drill on the end of its robotic arm and a complex sample collection system in its belly, Perseverance is snagging rock cores from the crater floor - the first step in the Mars Sample Return campaign.

"The samples Perseverance has been collecting will provide a key chronology for the formation of Jezero Crater," said Thomas Zurbuchen, associate administrator of NASA's Science Mission Directorate in Washington. "Each one is carefully considered for its scientific value."



A borehole drilled by Perseverance, The core samples are to be collected and possibly be sent back to earth for examination

More About the Mission

A key objective for Perseverance's mission on Mars is astrobiology, including the search for signs of ancient microbial life. The rover will characterize the planet's geology and past climate, pave the way for human exploration of the Red Planet, and be the first mission to collect and cache Martian rock and regolith (broken rock and dust).

Subsequent NASA missions, in cooperation with ESA (European Space Agency), would send spacecraft to Mars to collect these sealed samples from the surface and return them to Earth for in-depth analysis.

The Mars 2020 Perseverance mission is part of NASA's Moon to Mars exploration approach, which includes Artemis missions to the Moon that will help prepare for human exploration of the Red Planet. JPL, which is managed for NASA by Caltech in Pasadena, California, built and manages operations of the Perseverance rover.

Perseverance Breakdown

SuperCam

Laser micro-imager

Mastcam-Z

Panoramic camera

MEDA

Weather station

PIXL

X-ray Spectrometer

Sherloc

Ultraviolet spectrometer

Rimfax

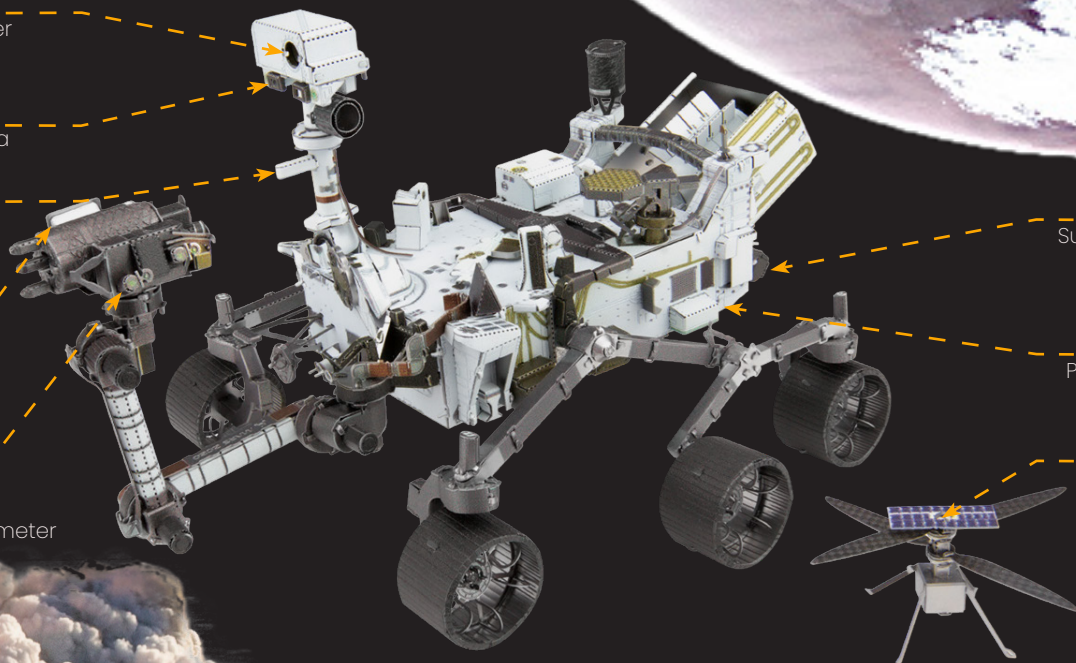
Subsurface Radar

Moxie

Produces oxygen

Ingenuity

Helicopter



TIME TRAVELERS:

What if you could view ancient history with your own eyes?

Time traveling, but how?

Well it's simple math. The speed of light is 299,792,458 m/s or the distance of going around the earth seven and a half times in one second. Now multiply that times the amount of seconds in a year and that equals to one light-year. In perspective, the sun is only around 8.3 light minutes away. The closest neighboring star, Proxima Centauri is around 4.3 light-years away. The nearest decent sized galaxy, Andromeda is around 2.5 million light-years away.

So what does this have to do with time traveling?

When you stare up at the sky, every single light you see, whether it's a planet, star or a plane, the light has to travel in order to be seen by you. That means, whatever light you see, has already occurred. As an example, the light from the sun has had to travel for about 8 minutes and 20 seconds from the sun to earth.

When astronomers gaze at the cosmos, rather with telescopes or their own two eyes, they are actually seeing the way stars were, hundreds, thousands, millions, billions of years ago. If you were looking at earth from Andromeda today, you would probably see the beginning of human evolution. While this isn't exactly sci-fi time traveling, being able to peek at another planet or stars ancient history without ever leaving your back yard is amazing.

Who are these backyard astronomers?

Carlos Navas is your retired Dallas Texas neighbor with a remarkable hobby. He photographs popular locations around the universe., including within our very own solar system. Carlos is one of many Amateur Astronomers and astrophotographers around the world. After investing thousands of dollars into gear, and countless hours of research and education, this has become a serious hobby for him.

How does he accomplish these amazing images?

Carlos has 3 telescope setups that he uses. He uses one to photograph most nebulae and large galaxies such as Andromeda. The other captures even further galaxies and nebulae and the third has the capabilities to view galaxies that are hundreds of million miles away.

After the lengthy setup, and calibration, technology takes over and does the image capturing for him. He then has to process all the photos he captured and stack them over each other using specific programs to gather all the colors and lights into one perfect image.

The weather, temperature, moon phase, time, and the night skies have much to do with an optimal session. Navigation, an understanding of basic astronomy and a lot of patience are key to your success.



THE ROCKET RACE

TOP 3 U.S. ROCKETS OF 2024

FALCON 9



SPACEX

ATLAS V



ULA™

ELECTRON



ROCKETLAB

Falcon 9 is an orbital class, reusable rocket developed by Space X. Falcon 9 uses a total of 10 Merlin engines, 9 on the first stage and (1 in the second stage) to deliver its payload into orbit. It is used to transfer cargo to the International space station, satellite deployment, or with the use of the Dragon Capsule, It is able to safely transfer astronauts to the ISS.

Stats Year 2023

- > Launch Attempts 96
- > Successful 96
- > Unsuccessful 0

Atlas V is developed by United Launch Alliance. This rocket uses a common core booster, that uses five solid rocket boosters, and a Centaur upper stage in a single or dual-engine configuration. Centaur is the world's highest performing upper stage that provides the industries best thrust-to-weight ratio.

Stats Year 2023

- > Launch Attempts 2
- > Successful 2
- > Unsuccessful 0

Electron is the smallest reusable launch vehicle capable of sending satellites into precise orbits. Developed by Rocket Labs, it stands only at the height of 59 feet, has 9 Rutherford engines. While It is the smallest of these 3 rockets, it's size allows it to be efficient, cost effective and fully capable of delivering its payload safe and sound.

Stats Year 2023

- > Launch Attempts 9
- > Successful 8
- > Unsuccessful 1

MILLION DOLLAR SUITS

The lifeline to an Astronaut's survival!



AX EMU AXIOM SPACE

Axiom Space AxEMU spacesuit is a revolutionary development in design, offering significant benefits for astronauts, space agencies, and commercial space companies. It utilizes features to withstand the dusty environment of the lunar surface and maintain critical interfaces that enable safe and effective extravehicular activities in micro-gravity. Developing the next spacesuit to walk on the moon takes the expertise of these sewers, technicians, engineers, medical personnel, and more working together to build history. Utilizing innovative soft and hard joints for an increased range of motion will enable astronauts to walk on the Moon more effortlessly. The suit can be maintained on orbit, reducing the time and cost required to operate missions that deliver results to benefit the future of robust innovation in low-Earth orbit and beyond. The development of these next generation spacesuits by Axiom Space is a significant milestone in furthering American leadership in space exploration, and enabling a deeper understanding of the Moon, and the solar system.



STARMAN SUIT SPACE X

Starman suit is developed by Space X for the use of the astronauts on board the Dragon crew capsule. It is tailor made to every astronaut and its main function is to serve as a protective suit in case there is cabin decompression.

The Starman Suit is comprised of a 3-D printed helmet with customized padding houses, microphones for communication and valves that regulate the suit's pressure systems. The visor is Designed to provide a large field of view and rotates open. The gloves are designed for easy use when the suit is pressurized and with the ability to operate Dragon's touchscreens. Zippers on the wrist allow astronauts to use their bare hands on the controls when appropriate. A single connection point between the suit and vehicle provides the life support system for the astronauts: avionics for communications, cooling systems, and pressurization of the suit, all via a plug-in.

BUZZ ALDRIN



On January 20, 1930, A legend was born. Edwin Eugene Aldrin Jr. is not only an American pilot and an Astronaut, but in 1969, he was the second human to ever set foot on the moon on board Apollo 11, right next to Neil Armstrong. Buzz Aldrin now at 94, is still making headlines in recent times. Just last year on January 20, 2023, his 93rd birthday, Aldrin announced on Twitter that he had married for the fourth time, to his 63-year-old companion, Anca Faur. Aldrin has primarily resided in the Los Angeles area, including Beverly Hills and Laguna Beach since 1985. In 2014, he sold his Westwood condominium and now lives on Satellite Beach, Florida.



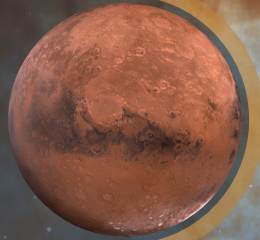
Buzz Aldrin, 1969: Apollo 11

THE FINAL FRONTIER

GOALS FOR THE DECADE

FROM MARS

Rock samples from the Mars Perseverance rover are set to be collected and brought back to earth via an earth return orbiter and sample retrieval lander. The launch dates are fall 2027 to summer 2028 and are to return to earth 2033, according to NASA.



BACK TO THE MOON

According to NASA, the crewed Artemis 2 launch will take place at the end of 2025 with the intent of a fly-by around the moon. A lunar landing, Artemis 3, is scheduled for 2026. An Artemis 4, Lunar Gateway is scheduled for 2028.



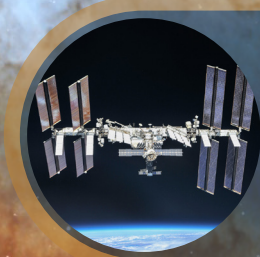
STARSHIP READY

With a static fire test completed in this month, January 2024, Space X is waiting on approval from the FAA for its next flight test. NASA plans to use the Starship as the Artemis 3 lunar lander and eventually to colonize mars.



GOODBYE I.S.S.

In 2030. The International Space Station is set to be decommissioned as NASA will be moving on to commercial platforms for low orbit science labs. There are several companies competing on the fabrication of the next and future space station.



EUROPA MISSION

Rock samples from the Mars Perseverance rover are set to be collected and brought back to earth via an earth return orbiter and sample retrieval lander. The launch dates are fall 2027 to summer 2028 and are to return to earth 2033, according to NASA.





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Editor: Luz Lopez

Design: Luz Lopez

Photography:

Luz Lopez
Carlos Navas

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Space X
Axiom Space
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Research & Information:

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