

THE EVOLUTION OF SPACE EPLORATION: PAST, PRESENT AND FUTURE

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Abstract: It is hard to find a “start” to space exploration as there were many technological developments leading up to the “beginning” of space exploration. It takes years of preparation of research and design for rockets and other technology and often times, they fail to work.

Key words: space, earth, Mars, moon, laboratory, collaboration, planets, telescopes.

The enchanting realm of space exploration continues to unfold new wonders with every passing day, sparking a growing interest among individuals to embark on their own cosmic journeys. While exploring space with the aid of private companies that charge fortunes is a privilege usually reserved for billionaire adventurers, there are occasional exceptions that captivate our attention.

Past:

Space Race(1957-1975): The Cold War rivalry between the United States and the Soviet Union led to significant milestones, including the launch of Sputnik 1 (1957) and Yuri Gagarin`s orbit of Earth (1961).

Apollo Program (1961-1972): NASA`s Apollo missions achieved the first manned moon landing with Apollo 11 in 1969, marking a historic moment in space exploration.

Space Shuttle Era (1981-2011): The Space Shuttle program facilitated regular access to space, supporting satellite launches, space station construction and scientific research.

Present:

International Space Station(ISS): The ISS serves as a multinationalall laboratory and living space, fostering international collaboration in space exploration since its launch in 1998.

Robotic Exploration: Unmanned missions, including rovers on Mars, probes to outer planets and telescopes like the Hubble, provide valuable data about our solar system and beyond.

Commercial Space Industry: Companies like SpaceX, Blue Origin and others are actively involved in developing commercial spaceflight capabilities, reducing costs and increasing access to space.

Future:

Artemis Program: NASA's Artemis aims to return humans to the Moon by the mid-2020s, including the first women and the next man, setting the stage for future crewed missions to Mars are being discussed by NASA, SpaceX and other international space agencies, envisioning a human presence on Mars in the coming decades.

Private Space Tourism: Commercial companies are working towards making space tourism a reality, allowing civilians too experience space travel.

Avancements in Space Technology: Ongoing developments in propulsion systems, space habitats and artificial intelligence are expected to revolutionize space exploration capabilities.

Challenge and Considerations:

Space Debris: The growing amount of space debris poses a threat amount of space debris poses a threat to future missions and necessitates international efforts to address space sustainability.

Human Health in Space: Long-duration spaceflights pose challenges to human health, including the effects of microgravity and radiation exposure.

International Collaboration: Continued collaboration between nations and public-private partnerships will be crucial for the success of future space exploration endeavors.

Many national space agencies are following in the footsteps of NASA and trying to figure out larger questions such as "are we alone" and "is the colonization of Mars possible"? They are seeking to find these answers with future missions to the moon with a plan for astronauts to land on the moon again by 2024, while private companies have been more focused on colonizing Mars and space travel. This is growing industry with many companies striving to make travel more affordable and accessible with ideas such as space tourism and space orbiting hotels. Elon Musk has said his life goal is, "to create a thriving Mars colony as a fail-safe for humanity in case of a catastrophic event on Earth, such as a nuclear war or Terminator-style artificial intelligence coup".

Although chances are we may not be in space or be the people colonizing Mars in our lifetime, we never know how far and fast space exploration can develop.

The evolution of space exploration reflects humanity's quest for knowledge and discovery, with technological advancements and international cooperation shaping the trajectory of our exploration beyond Earth.

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