



AI is Revolutionising Space Exploration in many ways

Recent advances in artificial intelligence (AI) have extended to outer space, with major implications for new discoveries and security. Space organisations like **NASA have been safely using AI for decades** to plan and schedule missions for planetary rovers, analyze satellite datasets, & diagnose, detect anomalies.

For instance AI is being used to automate time-consuming processes like program and project reviews, allowing global space agencies to streamline decision making, save resources, and leverage the full potential of their workforce. SpaceX's Starlink satellite constellation already uses AI to optimize communication networks and make autonomous decisions.

In the future, AI will play an even greater role in space, helping us explore new worlds, learn more about the universe and ensure human spaceflight is safe and successful. NASA's upcoming Artemis missions will rely on AI-powered technologies for autonomous navigation, communication, and data analysis.

Further AI is expected to dynamically impact asteroid mining, space debris removal and planetary colonization.

AI Quick Facts

- **NASA** is using AI to help plan future missions to Mars.
- **ESA** (European Space Agency) is using AI to control the ExoMars robot
- **China** is using AI to develop new propulsion systems for space programs
- **ISRO** (Indian Space Research Organisation) is using AI to create new space trajectories and spacecraft maneuverability for longer distances

Key AI Applications

- **Autonomous Navigation:** AI will help us navigate around Earth and other planets.
- **Mission Planning:** AI will be used to determine best trajectories for spacecrafts and best landing options.
- **Decision-Making:** AI can be used to make critical decisions such as when to abort or when to change course, ensuring mission safety and success.

“Earth, Moon and Mars are part of one Industrial Complex.” – Dr. APJ Abdul Kalam



A close-up view of an astronaut's boot and footprint in the lunar soil, during the Apollo 11 Mission

NASA

AI for Outer Space

