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NSS POSITION PAPER
Why Explore Space?

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Since the earliest times that we gazed towards the heavens, mankind has been fascinated with the study and exploration of space. We now live in an age of technology in which we have begun to take steps—both human and robotic—into our solar system, yet we have barely scratched the surface of the mysteries of our universe. Mankind has a natural curiosity and need to explore the unknown, and great civilizations have recognized that survival and prosperity depended on exploring and settling their surroundings as well as developing and applying new technologies.

History teaches, over and over, that societies that have pushed their frontiers have prospered; those that have not have withered. Space is the next frontier, of both geography and technology. No society has ever gone wrong betting on the frontier. This nation was invigorated spiritually, and prospered economically, by challenging and finding new uses for one frontier after another. Our massive investment in roads, railroads, air travel, and other technology in order to exploit them were amply rewarded. In the same way, the exploration and development of the space frontier presents both challenges and opportunities for our entire planet.

So what exactly goes on once we get to space? There are many space-related businesses and commercial ventures, from on-orbit communications and remote sensing satellites to space-based technology used right here on Earth. And services we rely on every day, such as telecommunications and weather forecasting, would not be available if it were not for space-based resources.

Indeed, many Earth-based technologies would not have been developed except to preserve priceless human cargo. Then, after building these crewed spacecraft, scientists and engineers looked at the thousands of specialized small parts they created and then found new Earth-based uses for them, creating hundreds of new industries that would not have existed but for the focused goal of human space exploration.

Humans, Robots, or Both?

One of the questions many people ask is whether robots can replace people in space. Although robotic probes play a very important role in exploring space, especially where people can not easily or safely travel, humans in space play a crucial role that cannot be duplicated. Indeed, the more demanding Space Shuttle and International Space Station missions have become, the more they highlight the crucial element—the presence of people in space.

For example, if it were not for humans in space the Hubble Space Telescope would be much less capable. Repairs and ongoing maintenance by the Space Shuttle and its crews have enabled the Hubble telescope to produce the most stunning and vibrant images of our universe ever seen. In fact, the Hubble was

originally launched aboard the Space Shuttle, as were the Venus probe Magellan the Jupiter probe Galileo and the solar probe Ulysses.

The value of human involvement in space operations has been demonstrated in both routine procedures and the ability to respond to the unexpected. Human roles in space span a broad range of areas and complement the work being done by robotic explorers and probes:

AS AN OBSERVER—People are selective in monitoring and recording space, stellar, and Earth; phenomena for the significant, the surprising, or even the beautiful.

AS AN EXPERIMENTER—Scientists accompanying their experiments into space can learn from a new process as it unfolds, then intervene or make changes to pursue a promising development.

AS A TECHNICIAN—Astronauts operate critical systems and mechanisms on board the Space Shuttle and International Space Station, check out sophisticated payloads or valuable satellites in the cargo bay before they are deployed in space, and make new repairs if required.

AS A TROUBLESHOOTER—Using ingenuity and determination, crew members have repaired the Shuttle's on-board systems in orbit, flown untethered to rendezvous with disabled spacecraft, repaired and redeployed satellites, and secured errant satellites in the cargo bay for return to earth.

As we embark on future journeys to return to the Moon or explore Mars, humans will play a vital role in understanding and interpreting the environment. Robotic probes can serve as critical pathfinders to unexplored planets like Mars, but the mobility, dexterity, intellect, reaction time, and situational awareness of human explorers will always surpass the capabilities of robotic or automated probes, even those remotely operated by humans.

There will be destinations in our universe with environments so hostile, or in locations too remote, that humans will never be able to visit, so there will always be a critical role for robotic exploration. To that end, the National Space Society supports a balanced space exploration program that supports both robotic and human space exploration.

But the ultimate purpose of going into space is to live and work there—just as the ultimate purpose of exploring the New World was colonization—and not merely to sit back on Earth and observe remotely while automated spacecraft report back. We do not send our cameras to the Grand Canyon; we go ourselves. We sent Lewis and Clark not just to describe the American West, but to learn where and how people could live there.

America grew by sending out seeds in different places and then filling in the spaces with trade and industry and new ideas. People have always found ways to prosper from their environments, however harsh, and we will do so on other worlds. We cannot begin to live and work in space without first going there. And, it is human destiny to escape the cradle of our planet of birth.