



# Human Spaceflight

## From Mars to the Stars

Louis Friedman

*A new paradigm for human space exploration*

Mars, the red planet named for the god of war, a mysterious dust-ridden place, is most like Earth in its climate and seasons. Of all the possible destinations in space to travel, Mars is the most likely for humans to reach. According to esteemed scientist Louis Friedman, it may be the only destination outside the moon to ever see human footprints.

Far from diminishing our future in space, *Human Spaceflight* lays out a provocative future for human space travel. The noted aerospace engineer and scientist says that human space exploration will continue well into the future, but space travel by humans will stop at Mars. Instead, nanotechnology, space sails, robotics, biomolecular engineering, and artificial intelligence will provide the vehicles of the future for an exciting evolution not just of space travel but of humankind.

Friedman has worked with agencies around the globe on space exploration projects to extend human presence beyond Mars and beyond the solar system. He writes that once we accept Mars as the only viable destination for humans, our space program on planet Earth can become more exciting and more relevant. Mars, he writes, will take hundreds, even thousands, of years to settle. During that time, humans and all our supporting technologies will evolve, allowing our minds to be present throughout the universe while our bodies stay home on Earth and Mars.

**Louis Friedman** holds a PhD in aeronautics and astronautics from MIT. He has worked on deep-space missions at the Jet Propulsion Laboratory (JPL) in Pasadena, California, and he co-founded The Planetary Society with Carl Sagan and Bruce Murray, serving as the organization's executive director for thirty years. He was co-leader of the Keck Institute for Space Studies (KISS) Asteroid Retrieval Mission and Interstellar Medium Exploration Studies at Caltech.

*"Most books about our future in space are written by dreamers. But Human Spaceflight: From Mars to the Stars is written by an aerospace engineer, Dr. Louis Friedman, who details exactly how exploration needs to unfold if it's valued at all as an activity of our species."*—Neil deGrasse Tyson, Astrophysicist, American Museum of Natural History

*"While much has been written about the human exploration of Mars and other inner solar system destinations, there has been very little about what the future of human exploration is beyond Mars. Friedman's book offers a chance to articulate what is possible—and what isn't."*—Jeff Foust, publisher and editor of *The Space Review*

*"Open the pages of this exciting book and meet Lou Friedman, engineer and explorer, who's been exploring space for half a century. For Lou, Mars is just a beginning—our intelligence and machines are bound for the stars!"*—Tom Jones, author of *Sky Walking: An Astronaut's Memoir*

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