



Advancing Human Exploration and Settlement of Mars

NASA Policy Requests for Trump Transition Team

Prepared by The Mars Society Executive Director & Senior Staff

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Executive Summary

The Mars Society advocates for a robust and sustainable human exploration program centered on the long-term goal of establishing a human presence on Mars. This document outlines key recommendations for NASA to accelerate Mars exploration, strengthen public-private partnerships, and foster international collaboration while ensuring cost-effective use of government resources.

A national commitment to Mars exploration would reaffirm U.S. leadership in space and inspire future generations.

Proposed Role of the Mars Society

1. Contribute Expertise

- Offer data and insights from analog research missions (e.g., MDRS, Flashline/Haughton).
- Leverage a global community of Mars-focused scientists and engineers to support NASA and administration priorities.
- Assist in public outreach and educational initiatives to raise awareness and enthusiasm for Mars exploration.

2. Engage Stakeholders

- Mobilize grassroots advocacy for Mars exploration and settlement goals.
- Facilitate dialogue among policymakers, industry leaders, and the public to build broad-based support.
- Endorse Jared Isaacman's nomination as NASA Administrator, emphasizing leadership aligned with rapid Mars exploration.

3. Collaborate on Technology Development

- Partner with NASA and private companies to test Mars-relevant technologies, particularly through programs like MDRS, Flashline, and our MarsVR.com digital analog project.
- Use the Mars Technology Institute (MTI) as an incubator for innovative, Mars-centric commercial ventures that support both exploration and a sustained human presence on the Red Planet.

About the Mars Society

The Mars Society, founded in 1998 by aerospace engineer Dr. Robert Zubrin and colleagues, is a Colorado-registered 501(c)(3) nonprofit organization dedicated to promoting the human exploration and settlement of the planet Mars. As a central voice in the international space community, it aims to spark public support, advance scientific research, and advocate for policies that accelerate human missions to the Red Planet. Through a diverse array of projects and outreach efforts, the Mars Society works to inspire global engagement with the idea that humanity's future depends on broadening our presence beyond Earth's orbit.

Key Defender of Science

A major focus of the Mars Society has been defending key space exploration missions threatened by budget constraints or policy decisions. During Sean O'Keefe's tenure as NASA Administrator, for instance, the Hubble Space Telescope faced the prospect of decommissioning due to concerns over servicing costs and astronaut safety. The Mars Society rallied public support and worked with policymakers to help ensure the mission's continued funding and the eventual servicing of Hubble, preserving one of humanity's most powerful scientific instruments. Similarly, when the Mars Curiosity rover program came under financial scrutiny, the Society once again advocated vigorously, highlighting Curiosity's capacity to break new ground in planetary science and the enormous public interest in sustained Mars exploration.

Key Programs

One of the Mars Society's most prominent programs is the Mars Desert Research Station (MDRS). Located in the Utah desert, MDRS simulates the harsh environment of Mars, offering researchers, scientists, and students hands-on experience in operations that mirror the challenges of life and work on another world. Over 300 Crews have rotated through this station, conducting scientific studies on geology, biology, engineering, and human factors—generating real-world data about mission planning, habitat design, and astronaut training.

Complementing MDRS is the Flashline Mars Arctic Research Station (FMARS), nestled in the remote Canadian Arctic on Devon Island. Flashline station is located nearby the pristine impact crater Haughton, which has been visited by NASA and other scientific expeditions for decades. This outpost further refines Mars analog research by giving participants the opportunity to test technologies, operational strategies, and teamwork in an unforgiving polar environment. Both MDRS and Flashline are essential to the Mars Society's mission, as they provide critical insights into the feasibility of sustainable human habitation on Mars.

Beyond research stations, the society encourages innovation and technical skill-building through the University Rover Challenge (URC). Held annually, the URC tasks dozens of international student teams, comprising over 400 students annually, with designing and building robust, versatile rovers capable of supporting scientific exploration and potential astronaut operations on Martian terrain. This competition not only fosters new talent in engineering and robotics but also bolsters interest in science, technology, engineering, and mathematics (STEM) disciplines worldwide.

The Mars Society is actively involved in promoting education and public engagement to inspire the next generation of explorers and innovators. As part of our initiatives, we are working to implement a national Mars education program that includes a Mars-focused STEM curriculum for schools, along with public events, competitions, and outreach campaigns. Through these efforts, we aim to foster a deeper understanding of Mars exploration and are actively partnering with organizations and communities to enhance engagement and provide valuable educational resources.

Establishment of the Mars Technology Institute

Formed as a cutting-edge research arm of the Mars Society, the Mars Technology Institute (MTI) brings together global experts and industry partners to accelerate breakthroughs in Energy, Biotech, Robotics, and Artificial Intelligence, all with the goal of realizing sustainable human settlement on Mars. As part of its mission, MTI uses a Venture Studio model to pair investors with fledgling research teams, accelerating the creation of new startups through rapid prototyping and funding. This approach is guided by a comprehensive roadmap spanning the four core technology areas, and has already yielded multiple startup companies—both domestically and abroad—closely aligned with MTI's overarching vision. Through an interdisciplinary blend of expertise, the Mars Technology Institute works to set up an entrepreneurial pipeline of companies that will help us pioneer Mars while also improving the lives of everyone on Earth.

NASA Policy Requests and Priorities

1. Establishing a National Goal: Humans on Mars by the 2030s

Recommendations:

- Declare human exploration of Mars as a national priority.
- Set a specific and measurable goal: “Landing humans on Mars by 2033.” i.e. The Mars Exploration Act¹.
- Adopt a clear roadmap with milestones and precursor robotic missions.

Rationale:

Similar to the Apollo program, a bold national goal will unify efforts across NASA, industry, and international partners. Establishing a timeline creates urgency and focus, ensuring progress and accountability.

2. Strengthening Analog Research and Human Factors Testing

Recommendations:

- Recommend NASA utilize more Public-Private Partnerships with external vendors for analog research and participation.
- Leverage existing NASA funding to upgrade Moon and Mars analog research stations such as the Mars Desert Research Station (MDRS) and Flashline Mars Arctic Research Station.
- Integrate analog research findings into NASA's Human Research Program.
- At these analog facilities, sponsor goal-oriented projects with measurable results that move the technology baseline towards safer, faster and easier exploration of the Moon and Mars.

Rationale:

Analog missions provide invaluable insights into the psychological, physical, and operational challenges of living on Mars. Using commercial and nonprofit partners for analog research will be significantly more cost-efficient.

¹ The Mars Society advocates for a Mars Exploration Act, enshrining in federal law a Mars goal for NASA by Congress. More info at bit.ly/marsact

3. Funding and Support for Key Mars Exploration Programs while ending budget busters

Recommendations:

- Cut Lunar Gateway and SLS: These programs are ineffective and divert critical economic resources to use towards missions directly to Mars.
- End the current "Moon to Mars" framework and establish Mars-specific exploration and research priorities through Mars-dedicated decadal surveys.
- **Replace MSR mission with expanded robotic scouting program supporting human exploration of Mars.**
 - Many rovers and helicopters sent to scout numerous candidate Mars base locations with varied instruments.
 - Using a human-scale landing system to deliver robotic expeditions including many rovers, helicopters and instruments to explore and develop landing site 1 by 2028.
- Support for Robotic Precursor Missions:
 - Fund missions to map water ice deposits, test ISRU technologies, set up laser communications, and conduct environmental assessments.
- Revitalize NASA focus on exploration; preserve NASA's Budget Allocation for Exploration:
 - Prioritize funding for technologies critical to Mars missions, such as nuclear energy, ISRU, and long-duration life support systems.
 - Review of all mission proposals that did not win in decadal surveys. Combined with a secondary space-based laser DSN, this fresh look could accelerate planetary science tenfold and revitalize interest in all physical sciences.

Rationale:

A critical focus on Mars-specific missions will accelerate progress by prioritizing technologies like ISRU, nuclear energy, and long-duration life support while redirecting resources from ineffective programs like Gateway and SLS. Dedicated Mars-focused decadal surveys and robotic precursor missions, including an expanded scouting program, will accelerate the success of human exploration and settlement.

4. Leveraging Public-Private Partnerships

Recommendations:

- Support the Mars Society's Mars Technology Institute (MTI), designed as a research institute combined with an incubator to cultivate research and critical businesses that will drive the rapid advancement of Mars settlement efforts.

- Incentivize private investment through tax credits and government-backed loan guarantees.
- Expand programs like NASA's Commercial Crew and Cargo and commercial LEO Destinations (CLDs) to include Moon and Mars-focused technologies.
- Collaborate with commercial companies like SpaceX, Blue Origin, Rocket Lab, and others for transportation, surface systems, and habitat development/delivery.
- Strengthen NASA's liaison function with commercial and non-profit communities, including representation in cities without existing NASA centers, such as Seattle and Denver.

Rationale:

Public-private partnerships reduce costs, accelerate innovation, and engage the private sector in advancing national goals, specifically the goal of Mars exploration and settlement. NASA can create strong commercial and non-profit collaboration with NASA liaisons to accelerate Mars exploration.

5. Addressing Policy and Governance

Recommendations:

- Modify Planetary Protection Protocols to ensure Mars Sample Return can be expedited as soon as possible.
- Establish a Mars Exploration Advisory Council composed of government, industry, and academic experts.
- Review and streamline regulatory barriers to Mars-focused commercial activities.

Rationale:

A coordinated approach with strong leadership, streamlined regulations, and updated protocols ensures efficient program management, stakeholder alignment, and accelerated progress in Mars exploration. Planetary Protection Protocols remain an impediment to retrieving Martian samples (MSR). The Mars Society advocates that Planetary Protection Protocols are overly emphasized because of a lack of understanding of interplanetary meteorite interchange over geologic time.

6. Developing a Mars Infrastructure Program

- **Triple-Use Technologies (Earth, Moon, Mars)**
 - **Surface Infrastructure:** Modular habitats, power systems, communication networks, mobility solutions
 - **Transportation:** Heavy-lift rockets, in-situ resource utilization (ISRU) for fuel, water, and oxygen
 - **Biotech & Human Factors:** Sustainable agriculture, radiation protection, closed-loop life support
 - **Research:** NIAC-like “city on Mars” studies; Mars Technology Institute focus on AI, robotics, energy, food biotech

Rationale:

Clear, milestone-driven programs ensure accountability and secure funding while advancing settlement on Mars. The Mars Society anticipates developing more programs to enable future Martian infrastructure.

Conclusion

We are committed to supporting any of these initiatives and are eager to contribute our expertise and resources to ensure their success. The Mars Society is ready to assist in workshops, provide thought leadership, and collaborate with stakeholders to advance the vision of Mars exploration and settlement. Additionally, we are highly interested in exploring funding opportunities to expand or scale up our current programs, including those under the Mars Technology Institute (MTI). We wholeheartedly support Jared Isaacman as NASA Administrator, believing his leadership would greatly accelerate America’s progress in space exploration. This is an exciting time in humanity's journey to Mars, and we are honored to be part of this pivotal transition toward establishing a sustainable human presence on the Red Planet.

Sincerely,

James Burk

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This document had inputs from the Mars Society Board and Senior Volunteers.