



NATIONAL SPACE SOCIETY

RESOURCES TO UNDERSTAND THE 2004 HUMAN SPACE EXPLORATION VISION

From the “grass roots” to Capitol Hill, people ask: Why should we go into space which is a forbidding environment not ‘fit’ for humans to live in? Why should we spend ‘all that money’ when there are so many things we need to do on Earth first? And if we do go, just how will we do it?

These are fair questions. For those who want the answers, the National Space Society has prepared this Resource Packet – first as a source of information, and second, as a permanent resource that can be filed away and pulled out to refresh recollection and to pass on to colleagues. We support the new national Vision for Space Exploration, and hope after you read this document, you will understand why – and join us advocating a bold and hopeful vision of humanity’s future in space.

Contents:

- A Call for Action
- What is the National Space Exploration Vision? – What did the President Propose?
 - Primary changes in space policy
 - Other announcements by the President
 - Other announcements (not made in the President’s speech)
- The President’s Commission on Moon, Mars and Beyond with contact information
- Why Should We Explore and Develop Space – Why is it Important?
- What You Can Do to Support the National Vision for Space Exploration
- Web Site List – Space Related Topics
- Appendix – Full text of the President’s speech on Space Exploration, Jan 14, 2004

Contact information for the National Space Society:

Executive Director: George Whitesides Frank Braun, VP for Public Affairs
 E-mail: george@nss.org Phone: (310) 739-4402

National Space Society Tel: (202) 429-1600
 1620 I Street NW, Suite 615, FAX: (202) 463-8497
 Washington, DC 20006 E-mail: nsshq@nss.org

Direct all questions about membership matters to members@nss.org

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A Call for Action

The National Space Society strongly supports the new national vision for space exploration, to take us back to the Moon and on to Mars. Now, it needs your help to get it moving and start exploring! We can do it if we remember what makes the US great and do it together.

Here are the top ten things you can do to support the plan:

1. Inform yourself about the new Vision for Space Exploration. This document is a good place to start.
2. Dig a little deeper! You can read the official plan online at:
http://www.nasa.gov/missions/solarsystem/explore_main.html
3. Make an appointment with your local office of your congressional representative and explain why you support the plan. You can find the contact information for your representative by visiting the Congress websites:
www.senate.gov – for Senators
www.house.gov – for Representatives
4. Come to Washington DC for the NSS Legislative Conference on July 11-13 and visit Congress directly!
For more info, visit: www.nss.org/legislative
To make your reservation, contact: Legislative-Conf@NSS.org
5. Write a letter to your local paper about why you support the plan.
For sample letters, visit: www.nss.org/letters
6. Call or write your Congressional representatives about your support for the plan. Find phone numbers, emails and letter addresses at:
www.senate.gov – for Senators
www.house.gov – for Representatives
7. Join or donate to the National Space Society, or another leading space advocacy organization.
To join, visit: www.nss.org
8. Give a talk to a local club or Scout about why support the plan.
For a free Powerpoint presentation, visit: www.nss.org/presentation
9. Sign your name to the 'Go For Mars' petition at www.space.com/goformars
10. Tell three of your friends why you support the plan, and email them a copy of this list!

What is the Exploration Initiative – What did the President propose?

President George W. Bush's speech, "**A Renewed Spirit of Discovery**", was made at NASA headquarters on Jan 14, 2004, with NASA Administrator O'Keefe, other NASA officials, Congressmen, former astronauts, industry representatives and space advocates in attendance. The speech was later issued as a Presidential Directive, setting overall guidance for a national effort for human and robotic space exploration. *It is primarily a change in policy, not a detailed plan or design.*

Primary Changes in Space Policy:

- We will return to Space Exploration beyond Low Earth Orbit as a primary Mission for NASA.
- We will focus on coordinated use of both Robotic and Human missions in support of exploration goals.
- We will Create an "Extended Human Presence" on the Moon.

Other Announcements by the President:

- The shuttle will be returned to flight status, probably sometime 2005.
- We will finish construction of the International Space Station (ISS) by about 2010.
- The Space Shuttle will be retired by 2010 or when the ISS is completed.
- The primary mission of the Space Station will be to support development of hardware and techniques with which to conduct future Exploration Missions to the Moon and into deep space.
- We will develop a CEV (Crew Exploration Vehicle) which will be tested unmanned by 2008.
 - It would be used both as a crew transfer vehicle to the ISS and also for exploration missions.
- We will resume unmanned reconnaissance of the moon by 2008 to support human missions.
- We will fly the CEV with a crew by 2014
- We will return to the Moon with man-tended bases and "increasingly extended missions" during the 2015-2020 period.
- We will consider using lunar resources to produce fuel for Missions to Mars.
- We will use the Lunar expeditions to prepare and test technology for missions to Mars and beyond.
- We will send human missions to Mars when the technology is ready.
- The US is interested in international participation in Lunar and other Exploration Missions.
- The White House has requested that O'Keefe perform a review of NASA to better direct its activities in support of the new policy.
- The White House has requested a \$1 Billion increase in NASA's budget spread over the next five years to pay for part of the new program.
- However, *most of the new costs will be paid for by re-allocation of funding within NASA.*

The President has created an Exploration Commission. This Commission is known informally as the Space Exploration Commission, or the Aldridge Commission and it is expected to prepare a report within 120 days (by June 11, 2004).

Other Announcements (not made in the President's speech):

- Changes in NASA organization (made by NASA officials in response to the Presidential Announcement)
- Creation of Office of Space Exploration (Code T), headed by retired Navy Admiral Craig Steidle
- Changes in Proposed NASA budget allocations (Made by budget officials in US budget documents.)
- Nine members were appointed to the Exploration Commission. (see below for list) on February 9, 2004
- The Commission is holding public hearings around the country.

The President's Commission on Moon, Mars and Beyond

The Formal name is "*Presidential Commission on Implementation of United States Space Exploration Policy*".

The commission has invited public comment and testimony on the future of the space program. They have a web site with a text forwarding window. If you have an existing document, you can paste the entire text into the window from the Windows clipboard to transmit it to the Commission, or you can type a message into the window manually. You can also send documents to them at their postal address.

Web address: <http://www.moontomars.org/>

Postal Address:

President's Commission on Implementation of U.S. Space Exploration Policy
2900 South Quincy Street, Suite 800
Arlington, VA 22206

Contacts: **Susan Flowers 703-416-3218** **susanflowers@moontomars.org**
 Susan Switzer 703-416-8646 **susanswitzer@moontomars.org**

Mission and Charter

To provide recommendations to the President on implementation of the vision outlined in the President's policy statement entitled: "A Renewed Spirit of Discovery" and the President's Budget Submission for Fiscal Year 2005.

To advise NASA on the long-term implementation of the President's vision, specifically with regard to:

- * A sustained and affordable human and robotic program to explore the solar system and beyond
- * Extended human presence across the solar system beginning with a return to the Moon before the year 2020
- * Innovative technologies, knowledge and infrastructures to explore and support decisions about the destinations for human exploration
- * International and commercial participation in space exploration to promote scientific, security, and economic goals.

Members of the Commission, headquartered in Arlington, VA, are:

Chairman: **Edward C. "Pete" Aldridge**, a former Secretary of the Air Force, and former CEO of the Aerospace Corporation and President of McDonnell-Douglas Electronic Systems Company. He was most recently the DOD Undersecretary for Acquisition, Technology and Logistics.

Members:

- * **Carleton Fiorina**, Chairwoman and CEO, Hewlett Packard, who holds a masters of science degree from MIT's Sloan School and a masters degree in business administration from the Robert H. Smith School of Business, University of Maryland
- * The **Honorable Michael P. Jackson**, Senior VP, AECOM Technology and former Deputy Secretary of the U.S. Department of Transportation
- * **Laurie Ann Leshin**, Director of Arizona State University's Center for Meteorite Studies, who is currently leading a team that is designing a potential mission to Mars for collection of soil samples
- * **General Lester L. Lyles**, USAF, Retired, former commander of the Air Force Materiel Command, who holds a master of science degree in mathematics and nuclear engineering, New Mexico State University
- * **Paul D. Spudis**, Planetary Scientist, Johns Hopkins University, who specializes in the geology of the moon and was deputy leader of the science team for the Clementine lunar mission in 1994
- * **Neil deGrasse Tyson**, prolific author, educator and Frederick P. Rose Director of the Hayden Planetarium, who served on the Commission on the Future of the US Aerospace Industry, 2001-2002.
- * The **Honorable Robert S. Walker**, Chairman and CEO, The Wexler & Walker Public Policy Associates and former Congressman from Pennsylvania who served as Chairman of the House Science and Technology Committee; former Chairman of the Commission on the Future of the United States Aerospace Industry, 2001-2002.
- * **Maria Zuber**, E.A. Griswold Professor of Geophysics and Planetary Sciences, MIT, who has been involved in more than half a dozen planetary missions aimed at mapping the Moon, Mars, Mercury, and asteroids.

Why Should We Explore and Develop Space – Why is it Important?

This provides a short, comprehensive, organized list of all the reasons that people have thought of so far. These items are not necessarily in the order of importance. Also, note some degree of overlap.

(I) Short Term Economic Reasons

1. **Applied Science** (practical application of knowledge and skills for industry).
2. Technological **Spin-offs**: (computer chips, medical monitors, etc.).
3. Current Short-term Benefits: (examples - generation of high-tech aerospace jobs, information technologies)

(II) Long Term Economic Reasons

4. **Space Development**: Use of space sites, materials & energy for Earth and Mankind's benefit, Expansion of Human **economic** activity into the Solar System. These include:
 - A. Use of **positions** such as Geosynchronous Orbit, L2, etc., for communication, imaging etc.
 - B. Use of non-terrestrial **materials** and resources like moon rocks and asteroids as inputs for manufacture of oxygen, water, fuels, processed metals, and other useful products.
 - C. Use of solar and gravitational **energy** in space for use in space and on the earth and moon.
 - D. Construction of **infrastructure** in space (bases, fuel depots, refuges, etc.).
 - E. Use of **conditions** in the space environment (micro-gravity, hard vacuum) by industry or science.

(III) Currently Non-Economic Reasons

5. Basic **Human Drive to Explore** (vicarious or direct), (Overlaps with Adventure and Tourism).
6. **Adventure** (Overlaps with Exploration and Tourism).
7. Acquisition of **Fundamental Knowledge** - basic (pure) science. Historically, this will almost always become economically valuable at some point.
8. **Settlement, Personal Emigration, Colonization and Survival** in space or on planets:
 - A. End the "*all our eggs in one basket*" situation (all of the human race on just one planet), by creating a "backup copy" of the human race and human civilization, history, art and knowledge. (Remember, the backup copy always needs to be in a different place than the primary copy!)
 - B. Expansion of the human species off the planet, with growth into new habitats.
 - C. Greater diversity (type & number) of places for people to live.
 - D. Increase social diversity & refuges for minority groups, & Emigration – personal reasons.
 - E. Eventual creation of a free spacefaring civilization.
9. **Biological Reasons**:
 - A. Genome repository and backup for all Earth Species in living, frozen, or digital storage.
 - B. Spread the biosphere beyond the Earth, to Mars, etc. (with terraforming)
 - C. Protect Earth environment from Global Warming, Asteroid Impacts by space development
 - D. Provide safe locations to test nanotechnology and other potentially hazardous biological tools.
 - E. Increase biological diversity as organisms adapt and evolve to survive on other planets.
10. **Cultural Reasons** (Arts) Enrichment, Entertainment and Diversity:
 - A. New types of entertainment & cultural activities (art, ballet, etc.).
 - B. New zero gravity or low gravity sports (participate or watch).
 - C. Space tourism, the new experiences of space travel. (Overlaps with Adventure and Economics).
11. Improvement in **Quality of Life** for people on Earth. (Overlaps with Space Development).
12. Stimulate **Science Education**, interest and enrollment in science and engineering curricula in grade school, high school and college. (This will also have an economic benefit)
13. Encourage **International Cooperation** via space projects.
14. **National Prestige**.

What You Can Do to Support the National Vision for Space Exploration

Thus far, the new Vision for Space Exploration has had a mixed reception with members of Congress and the press. It has been attacked as being prohibitively expensive, and as too bold or not well enough thought out. Whether it is adopted, and *how* it is implemented, will decide the fate of the American civil space program for the next 30 years. If you agree with NSS that this Vision is a hopeful change in the direction of American space policy that can lead to a “space program that goes somewhere,” we invite you to join us in the public debate to educate the public and decision makers on why it is important.

First, it is important that false information about the cost of the program be corrected, and the economic and other benefits of the program to America and the rest of the world explained, whenever the Vision is attacked in the press. You can write letters to the editor of the publications in which negative statements appear, so that the other side of the story is heard. Letters to the editor should include your name, address, day and night telephone numbers (most publications won't publish letters unless they've verified that they come from the person whose name appears on the signature line, and this verification is often done via phone call), and e-mail address. Short, succinct letters stand the best chance of publication. No letter should be more than a page, and half a page is better. Letters that are brief and to the point have a better chance of being published. Most newspapers and magazines now accept letters to the editor via e-mail as well as through the post office. Here's e-mail contact information for a few of the major national opinion magazines and newspapers:

NEWSWEEK – letters@newsweek.com

US NEWS & WORLD REPORT – letters@usnews.com

TIME – letters@time.com

WASHINGTON POST – letters@awshpost.com

WALL STREET JOURNAL – wsj.ltrs@wsj.com

NEW YORK TIMES – letters@nytimes.com

After you've written your letter to the editor, you can share it with NSS by sending a copy, along with a note as to which publications you submitted it to and whether it was published, to NSS headquarters at e-mail address letters@nss.org. A selection of the best letters will be posted to the NSS website as inspiration to other space advocates.

It is also vitally important that your members of Congress in both the House and Senate know that the Vision has public support. You can write and tell them so.

The general address for the Senate is: Senator _____
U.S. Senate
Washington, D.C. 20510

The address for the House of Representatives is: The Honorable _____
U.S. House of Representatives
Washington, D.C. 20515

You can find more detailed address information for your representatives (exact building and office number, as well as phone number and e-mail address) at www.senate.gov and www.house.gov, respectively.

The President also needs to know that his proposal has your support. You can reach President Bush by phone, e-mail or letter. The e-mail address for the President is president@whitehouse.gov. Vice President Cheney, who has been active in the task force appointed by the President to examine U.S. space policy, can be reached at vice.president@whitehouse.gov. The phone number for the White House Comment Line is (202) 456-1111.

The President's mailing address is: President George W. Bush
The White House
1600 Pennsylvania Avenue
Washington, D.C. 20500

Web Site List – Space Related Topics

Space News, Politics, Technology and Discoveries are all changing very rapidly. Here is a list of web sites that will keep you current on what's happening.

http://www.nss.org	Main NSS web site with sub-topic pages
http://www.nsschapters.org	NSS information about and for NSS chapters and members with sub-topic pages
http://www.moontomars.org	The Presidents Commission on Space Exploration with sub-topic pages
http://www.space.com	Well organized space news service with competent reporters and a good set of sub-topic pages such as news, science, missions, etc.
http://www.spaceref.com	Excellent space news site with insight and archives
http://www.nasawatch.com	Site focusing on internal NASA issues and problems
http://www.flatoday.com/space/	Florida Today – space news site
http://www.thespacereview.com/index.html	On-line Journal - essays and commentaries about space.
http://marsrovers.jpl.nasa.gov/home/index.html	JPL site covering the current MER robotic expeditions.
http://www.badastronomy.com/info/whois.htm	Philip Plait's site for debunking claims that the Apollo moon landings were faked, as well as debunking other crackpot astronomy
http://spacefoundation.org/spacevision/	The site includes a timeline, video, and PowerPoint show

Appendix – Text of the President’s Speech on Space Exploration, Jan 14, 2004

"A Renewed Spirit of Discovery"

Thanks for the warm welcome. I'm honored to be with the men and women of NASA. Want to thank those of you have come in person. I welcome those who are listening by video.

This agency and the dedicated professionals who serve it have always reflected the finest values of our country: daring, discipline, ingenuity and unity in the pursuit of great goals. America is proud of our space program. The risk-takers and visionaries of this agency have expanded human knowledge, have revolutionized our understanding of the universe and produced technological advances that have benefited all of humanity.

Inspired by all that has come before, and guided by clear objectives, today we set a new course for America's space program. We will give NASA a new focus and vision for future exploration. We will build new ships to carry man forward into the universe, to gain a new foothold on the moon and to prepare for new journeys to the worlds beyond our own. I am comfortable in delegating these new goals to NASA under the leadership of Sean O'Keefe. He's doing an excellent job.

I appreciate Commander Mike Foale's introduction. I'm sorry I couldn't shake his hand. Perhaps, commissioner, you'll bring him by - administrator, you'll bring him by the Oval Office when he returns so I can thank him in person. I also know he is in space with his colleague, Alexander Kaleri, who happens to be a Russian, a cosmonaut. I appreciate the joint efforts of the Russians with our country to explore. I want to thank the astronauts who are with us, the courageous special entrepreneurs who set such a wonderful example for the young of our country. And we got some veterans with us today. I appreciate the astronauts of yesterday who are with us as well, who inspired the astronauts of today to serve our country. I appreciate so very much the members of Congress being here. Tom Delay is here, leading a House delegation. Senator Nelson is here from the Senate. I am honored that you all have come. I appreciate your interest in this subject. It is a subject that is. ... It's a subject that's important to this administration. It's a subject that's mighty important to the country and to the world.

Two centuries ago, Meriwether Lewis and William Clark left St. Louis to explore the new lands acquired in the Louisiana Purchase. They made that journey in the spirit of discovery to learn the potential of the vast new territory and to chart the way for others to follow. America has ventured forth into space for the same reasons. We've undertaken space travel because the desire to explore and understand is part of our character. And that quest has brought tangible benefits that improve our lives in countless ways. The exploration of space has led to advances in weather forecasting, in communications, in computing, search and rescue technology, robotics and electronics. Our investment in space exploration helped to create our satellite telecommunications network and the Global Positioning System. Medical technologies that help prolong life, such as the imaging processing used in CAT scanners and MRI machines, trace their origins to technology engineered for the use in space.

Our current programs and vehicles for exploring space have brought us far, and they have served us well. The space shuttle has flown more than a 100 missions. It has been used to conduct important research and to increase the sum of human knowledge. Shuttle crews and the scientists and engineers who support them have helped build the International Space Station. Telescopes, including those in space, have revealed more than 100 planets in the last decade alone. Probes have shown us stunning images of the rings of Saturn and the outer planets of our solar system. Robotic explorers have found evidence of water, a key ingredient for life on Mars and on the moons of Jupiter. At this very hour, the Mars exploration rover Spirit is searching for evidence of life beyond the Earth.

Yet for all these successes, much remains for us to explore and to learn. In the past 30 years, no human being has set foot on another world or ventured farther up into space than 386 miles, roughly the distance from Washington, D.C., to Boston, Mass. America has not developed a new vehicle to advance human exploration in space in nearly a quarter century. It is time for America to take the next steps.

Today I announce a new plan to explore space and extend a human presence across our solar system. We will begin the effort quickly, using existing programs and personnel. We'll make steady progress, one mission, one voyage, one landing at a time.

Our first goal is to complete the International Space Station by 2010. We will finish what we have started. We will meet our obligations to our 15 international partners on this project. We will focus our future research aboard this station on the long-

term effects of space travel on human biology. The environment of space is hostile to human beings. Radiation and weightlessness pose dangers to human health. And we have much to learn about their long-term effects before human crews can venture through the vast voids of space for months at a time. Research on board the station and here on Earth will help us better understand and overcome the obstacles that limit exploration. Through these efforts, we will develop the skills and techniques necessary to sustain further space exploration.

To meet this goal, we will return the space shuttle to flight as soon as possible, consistent with safety concerns and the recommendations of the Columbia Accident Investigation Board. The shuttle's chief purpose over the next several years will be to help finish assembly of the International Space Station. In 2010, the space shuttle, after nearly 30 years of duty, will be retired from service.

Our second goal is to develop and test a new space craft, the crew exploration vehicle, by 2008, and to conduct the first human mission no later than 2014. The crew exploration vehicle will be capable of ferrying astronauts and scientists to the space station after the shuttle is retired. But the main purpose of this spacecraft will be to carry astronauts beyond our orbit to other worlds. This will be the first spacecraft of its kind since the Apollo command module.

Our third goal is to return to the moon by 2020, as the launching point for missions beyond. Beginning no later than 2008, we will send a series of robotic missions to the lunar surface to research and prepare for future human exploration. Using the crew exploration vehicle, we will undertake extended human missions to the moon as early as 2015, with the goal of living and working there for increasingly extended periods of time.

Eugene Cernan, who is with us today, the last man to set foot on the lunar surface. He said this as he left: "We leave as we came and, god willing, as we shall return, with peace, and hope for all mankind." America will make those words come true. Returning to the moon is an important step for our space program. Establishing an extended human presence on the moon could vastly reduce the cost of further space exploration, making possible ever more ambitious missions. Lifting heavy spacecraft and fuel out of the Earth's gravity is expensive. Spacecraft assembled and provisioned on the moon could escape its far-lower gravity using far less energy and thus far less cost. Also the moon is home to abundant resources. Its soil contains raw materials that might be harvested and processed into rocket fuel or breathable air.

We can use our time on the moon to develop and test new approaches and technologies and systems that will allow us to function in other, more challenging, environments. The moon is a logical step toward further progress and achievement. With the experience and knowledge gained on the moon, we will then be ready to take the next steps of space exploration: human missions to Mars and to worlds beyond. Robotic missions will serve as trailblazers, the advanced guard to the unknown. Probes, landers and other vehicles of this kind continue to prove their worth, sending spectacular images and vast amounts of data back to Earth.

Yet the human thirst for knowledge ultimately cannot be satisfied by even the most vivid pictures or the most detailed measurements. We need to see and examine and touch for ourselves. And only human beings are capable of adapting to the inevitable uncertainties posed by space travel. As our knowledge improves, we'll develop new power generation, propulsion, life support and other systems that can support more distant travels. We do not know where this journey will end. Yet we know this: Human beings are headed into the cosmos. And along this journey, we'll make many technological breakthroughs. We don't know yet what those breakthroughs will be. But we can be certain they'll come and that our efforts will be repaid many times over.

We may discover resources on the moon or Mars that will boggle the imagination, that will test our limits to dream. And the fascination generated by further exploration will inspire our young people to study math and science and engineering and create a new generation of innovators and pioneers. This will be a great and unifying mission for NASA. And we know that you'll achieve it.

I've directed Administrator O'Keefe to review all of NASA's current space flight and exploration activities and direct them toward the goals I have outlined. I'll also form a commission of private- and public-sector experts to advise on implementing the vision that I've outlined today. This commission will report to me within four months of its first meeting. I'm today naming former Secretary of the Air Force Pete Aldrich to be the chair of the commission. Thank you for being here today, Pete. He has tremendous experience in the Department of Defense and the aerospace industry. And he is going to begin this important work right away.

We'll invite other nations to share the challenges and opportunities of this new era of discovery. The vision I outline today is a journey, not a race. And I call on other nations to join us on this journey, in the spirit of cooperation and friendship.

Achieving these goals requires a long-term commitment. NASA's current five-year budget is \$86 billion. Most of the funding we need for the new endeavors will come from re-allocating \$11 billion from within that budget. We need some new resources, however. I will call upon Congress to increase NASA's budget by roughly a billion dollars spread over the next five years. This increase, along with the refocusing of our space agency, is a solid beginning to meet the challenges and the goals that we set today.

This is only a beginning. Future funding decisions will be guided by the progress that we make in achieving these goals. We begin this venture knowing that space travel brings great risks. The loss of the space shuttle Columbia was less than one year ago. Since the beginning of our space program, America has lost 23 astronauts and one astronaut from an allied nation, men and women who believed in their mission and accepted dangers. As one family member said: The legacy of Columbia must carry on for the benefit of our children and yours. Columbia's crew did not turn away from the challenge, and neither will we. Mankind is drawn to the heavens for the same reason we were once drawn into unknown lands and across the open sea. We choose to explore space because doing so improves our lives and lifts our national spirit. So let us continue the journey. May God bless.