Lunar exploration can happen at many levels, ranging from a transfer vehicle leaving Earth orbit to the hard work of drilling lunar core samples to explore the geological heritage of the Moon.

To learn more about NASA’s new exploration vision, see pages 4 and 5.
To paraphrase Charles Dickens, it is the worst of times, it is the best of times. We’ve gone through a tough year. The loss of Columbia and its valiant crew still weighs heavy on our hearts and minds. Return To Flight requirements and fulfilling the CAIB Report’s recommendations have proven to be an enormous challenge. The resetting of the next launch date is evidence of that fact.

However it is also evident that “we get it” and will not let schedule pressure drive us to a premature launch. Our NASA leadership has demonstrated great courage in its RTF decisions to ensure that we will return to flight only when we are absolutely ready. Nevertheless, there is a lot of hard work going on with many hurdles and little outward progress to show for it. By itself, this situation can tend to dampen individual as well as team spirit.

However, our President has given us an incredible gift! With his new vision for space exploration he has provided us with the motivation to carry us through this very difficult time. He has challenged us, as well as promised us the necessary resources to go to the Moon, to Mars and beyond.

Of course, imperative to making this new journey is safe return to flight of Shuttle and completion of ISS. That means you and I hold the key to our nation’s and our world’s exploration of outer space. If this doesn’t motivate us to get the job done, I don’t know what will. We will prevail at our immediate tasks and then join in the quest to explore our solar system!

This won’t be easy, but if it was, anyone could do it. How fortunate we are to be on this team at this place during this juncture of human space exploration! Let us take pleasure in our work throughout this best of times.

IT’S GREAT TO BE ALIVE AND IN HOUSTON!

Guest Space
Charlene Gilbert  
Director of Technology Transfer and Commercialization

NASA’s high scoring technology featured at the Super Bowl

The familiar Monday night rhetorical question “Are you ready for some football?” resonated louder as we approached the biggest football event of the year. Most football enthusiasts, marked by the time-honored face paint and oversized number-one foam fingers, responded with a resounding, guttural, “Yes!” And why wouldn’t they? Today we are more ready than ever, thanks to the hard work of NASA people – you. Thousands of products that improve our lives here on Earth were kicked off from space. Last month, fans geared up to touch down at Reliant Stadium, featuring the NFL’s first retractable roof that scored its high technology from spacesuit fabric. Players on the field benefited from space-age materials in their protective shock-absorbing gear and helmets.

Sharing technology developed to tackle space exploration with private industry not only provides these valuable products to the public but also stimulates the economy, creating jobs and motivating U.S. competition by offering a technological edge. Partnering with businesses outside NASA helps leverage resources to unearth hidden discoveries that support NASA Enterprises.

As in the game of football, success relies on teamwork. Without a team-based environment, the Technology Transfer and Commercialization Office at Johnson Space Center could not be successful. The team, however, is not limited to its on-field players – all JSC contractor and civil servant employees, including scientists, engineers, researchers and innovators are critical to achieving a game win.

Sharing successful and valuable discoveries will help gain support and funding for current and future projects, allowing us to continue our search for life beyond. Kicking around ideas? Let us know about them. Discussing new knowledge and advances is a part of our responsibility as NASA employees and helps us to maintain a robust technology inventory.

For football buffs, it all boils down to passion - passion for the challenge, the spirit and the win. As devotees to future space exploration, we can all draw on this passion. As we forge ahead on a new year of exciting advancements, I encourage positive change and progress in the world of technology that will continue to impact lives everywhere.
JSC scores big during ‘Super’ February

By Joanne Hale and Debbie Nguyen

The Capital One College Football All-Star Challenge brings Super Bowl spirit to JSC

Super Bowl fever reached the Gilruth Center Jan. 30 for the 2004 Capital One College Football All-Star Challenge, which aired on Super Bowl Sunday on Fox Television.

JSC Center Director Lt. Gen. Jefferson D. Howell, Jr., kicked off the affair with his famous welcome, “It’s great to be alive and in Houston!”

This annual event, held in the midst of the Super Bowl frenzy, summoned several of college football’s biggest and brightest stars to challenge their skills against each other in a variety of tests. The players are paired up in teams — each team contains a quarterback and a running back or a wide receiver. Alumni of the College Football All-Star Challenge include Donovan McNabb, Daunte Culpepper and Patrick Ramsey. This year’s lineup featured a roster full of future NFL draft candidates:

Casey Clausen (University of Tennessee, Quarterback)
Roy Williams (University of Texas, Wide Receiver)
Jeff Smoker (Michigan State, Quarterback)
Chris Perry (Michigan, Running Back)
Jared Lorenzen (University of Kentucky, Quarterback)
Reggie Williams (University of Washington, Wide Receiver)
Rod Rutherford (University of Pittsburgh, Quarterback)
Julius Jones (Notre Dame, Running Back)

There were several other special guests who participated in the showdown: Marine Astronauts Lt. Col. Charlie Hobaugh, Lt. Col. George Zamka and Maj. Doug Hurley did a quick run-through of the four events to illustrate how each was to be completed; cheerleaders from Super Bowl teams Carolina Panthers and New England Patriots made an appearance; and Cocky, the University of South Carolina’s mascot, offered some comic relief between takes.

Each team went through four challenges that tested accuracy, agility, speed and teamwork. The results were as follows:

**Aerial Assault**
Smoker won this event with 110 points by hitting moving targets whose worth was determined by how far they went.

**Marines Obstacle Rush**
Perry claimed this event by making his way through different blockades in 33.77 seconds.

**Mitsubishi Throw Down**
Because Rutherford was the only one to land both throws in the designated landing zone within the allotted 45 seconds, he was crowned king of the Throw Down.

**Direct Connect Challenge**
Rutherford was able to complete all four passes to Jones in the fastest time, making them this year’s champions.

The NFL Experience

NASA excitement ran high during the NFL Experience at the George R. Brown Convention Center, which ran from Jan. 23 - 25 and Jan. 29 - Feb. 1. The NASA exhibit included the new Shuttle Launch Experience, which allowed visitors to experience the thrill of a launch through high-definition television and surround sound. In addition, the exhibit included an interactive International Space Station kiosk and a photo-opportunity spacesuit, as well as vibrant new exhibit panels depicting the Shuttle launch excitement. Numerous astronauts were also on hand throughout the event to sign autographs alongside professional football players. During the eight-day event, 208,000 people attended. Johnson Space Center employees and contractors staffed the exhibit.

Aerosmith visits JSC

The band Aerosmith — Steven Tyler, Joe Perry, Brad Whitford, Tom Hamilton and Joey Kramer — came to JSC to film a tribute video to NASA and the crew of Columbia that was performed during the pre-game show of Super Bowl XXXVIII.

By Joanne Hale and Debbie Nguyen

Astronauts Nicole Stott and Takao Doi sign autographs during the pre-Super Bowl event.

By Joanne Hale and Debbie Nguyen

Roy Williams (above), University of Texas wide receiver shows off his agility at the All-Star Challenge.

By Joanne Hale and Debbie Nguyen

Cocky, the University of South Carolina’s mascot, offered some comic relief between takes.

By Joanne Hale and Debbie Nguyen

E
By Kendra Phipps

‘Human beings are headed into the cosmos’

E levation ran high in Johnson Space Center’s Regal Auditorium as employees gathered to watch the speech.

President George W. Bush made a significant announcement Wednesday, Jan. 14, 2004, from NASA Headquarters concerning the future of the space agency. The speech was broadcast on NASA Television and shown to a packed auditorium at JC.

“This Agency, and the dedicated professionals who serve it, have always reflected the finest values of our country: discipline, ingenuity and unity in the pursuit of great goals,” Bush said. “Inspired by all who have come before and guided by clear objectives, today we set a new course for America’s space program.”

“We will build new ships to carry man forward in the universe,” he said. “We will gain a new foothold on the Moon and prepare for new journeys to worlds beyond our own.”

Bush’s plan contains three goals, which are posted in full at: http://www.whitehouse.gov/news/releases/2004/01/20040114-1.html:

- “America will complete its work on the International Space Station by 2010, fulfilling our commitment to our 15 partner countries. To accomplish this goal, NASA will return the Space Shuttle to flight consistent with safety standards and the recommendations of the Columbia Accident Investigation Board.”
- “The United States will begin developing a new manned exploration vehicle while exploring beyond our orbit to other worlds – the tip of its kind since the Apollo Command Module. The new spacecraft, the Crew Exploration Vehicle, will be developed and tested by 2008 and will be ready to its first manned mission no later than 2014.”
- “America will return to the Moon as early as 2015 and no later than 2020 and will use it as alaunchpad for more ambitious missions. A series of robotic missions to the Moon, utilizing the Spirit Rover that is sending remarkable images back to Earth from Mars, will explore the lunar surface beginning no later than 2008 and prepare for future human exploration.”

Bush said that the Space Shuttle primary purpose over the next few years will be to finish assembly of the Space Station, and that the fleet will be retired by 2010.

“Our current programs and vehicles for exploring space have brought us far, and they have served us well,” Bush said. “Yet for all these successes, much remains for us to learn and explore. It is time for America to take the next step.”

That “next step” is the Moon.

“The Moon is a logical step towards further progress and achievement,” Bush said. “With the experience and knowledge gained on the Moon, we’ll then be ready to take the next steps towards space exploration: human missions to Mars and worlds beyond.” At these words, applause erupted both in the Regal and at NASA Headquarters.

Bush said that while robotic missions will serve as “nailhead tasks” to the Moon, humans must be a part of the exploration in order to research more effectively and think through unforeseen challenges - as well as to satisfy the human desire to explore the unknown.

“The human thirst for knowledge ultimately cannot be satisfied by even the most vivid images or the most detailed measurements,” he said. “We need to see and examine and test for ourselves, and only human beings are capable of adapting to the inevitable uncertainties posed by space travel.”

Sending humans to the Moon will not be an inexpensive task. Bush outlined his budget plan during his speech, and the key points are posted in full at: http://www.whitehouse.gov/news/releases/2004/01/20040114-1.html. They include the points below:

- The funding added for exploration will total $12 billion over the next five years. Most of this added funding for new exploration will come from reallocation of $13 billion that is currently within the five-year NASA budget of $86 billion.
- In the fiscal year (FY) 2005 budget, the President will require an additional $1 billion to NASA’s existing five-year plan, or an average of $200 million per year.
- From the current 2004 level of $14.5 billion, the President’s proposal will increase NASA’s budget by an average of 5 percent per year over the next three years, and at approximately 1 percent or less per year for the two years after those.

Bush said that the country will be “repaid many times over” by the technological breakthroughs that will arise from new exploration, and made reference to the “tangible benefits that improve our lives in countless ways” that have come from the space program. These include improvements to weather forecasting systems, satellite telecommunications, computing, electronics and medical technologies.

Another return on this investment, Bush said, will be the enthusiasm of students generated by this exploration.

“The fascination generated by further exploration will inspire our young people to study math, science and engineering,” he said, “and create a new generation of innovation and discovery.”

Bush concluded with an acknowledgement of the upcoming anniversary of the Columbia accident, and of the fact that “space travel brings great risks.”

“Columbia did not turn away from the challenge and neither will we,” Bush said. “Many is drawn to the heavens for the same reasons we were once drawn to 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.”

“We do not know where the journey will end,” he said, “but we know this - human beings are headed into the cosmos.”

The President’s vision affirms the nation’s commitment to human space exploration starting with a return to the Moon that will ultimately enable future exploration of Mars and other destinations.

New Space Exploration Vision

On Jan. 14, the President announced a new vision for NASA:

- Implement a sustained and affordable human and robotic program to explore the solar system and beyond
- Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations
- Develop the innovative technologies, knowledge and infrastructure tools to explore and to support decisions about the destinations for human exploration
- Promote international and commercial participation in exploration to further U.S. scientific, security and economic interests

The vision affirms the earlier commitment to space exploration and provides a clear direction for the civil space program.

- Vision responds to concerns expressed by the CAB, Congress and elsewhere on the need for a long-term vision for human space exploration.
- Vision broadens those concerns to include returning humans to Mars, indeed, robotic activities and exploration of other destinations are critical elements.
- Activities will be based by experience, technology readiness and affordability.
- Implementation begins now with key missions that are already in progress such as Mars exploration, visits to other solar system targets andOrigins activities.

Guiding Principles for Exploration

Purposes

- Exploration of the solar system will be guided by compelling questions of scientific and societal importance.
- Consistent with the NASA Vision and Mission, NASA exploration programs will seek profound answers to questions of our origins, whether we exist beyond Earth and how we could live on other worlds.
- Across Multiple Worlds
- NASA will make progress across a broad front of destinations
- Continue with recent discoveries, NASA will focus on key habitats environments at the planet Mars, at the moons of Jupiter and in other solar systems.
- Where advantageous, NASA will also make use of destinations like the Moon and near-Earth asteroid to test and demonstrate new exploration capabilities.
- Employ Human and Robotic Capabilities
- NASA will send human and robotic explorers as partners, leveraging the capabilities of each with mutual benefit.
- Robotic explorers will visit new worlds first to obtain scientific data, demonstrate breakthrough technologies, identify space resources and send tantalizing imagery back to Earth.
- Human explorers will follow to conduct in-depth research, direct and upgrade advanced robotic explorers, prepare space resources and demonstrate new exploration capabilities.

For Sustainable Exploration

- NASA will pursue breakthrough technologies, investigate planetary resources and align ongoing programs to develop sustainable, affordable and feasible solar system exploration strategies
- The vision is not about one-time events and, thus, costs will be reduced to maintain the affordability of the vision.

Scope

- NASA will pursue this vision as our highest priority.
- Consistent with the FY 2005 budget, NASA will immediately begin to redesign programs and organizations, demonstrate new technical capabilities and undertake new robotic precursor missions to the Moon and Mars before the end of the decade.

Key Elements of New Space Policy

- Return the Space Shuttle to Flight and plan to retire it by the end of the decade, following completion of its role in the construction of the International Space Station.
- International Space Station
  - Complete assembly
  - Refocus research to exploration factors affecting astronaut health.
  - Acquire new crew and cargo systems, as necessary during and after availability of Shuttle.
- Crew Exploration Vehicle (CEV)
  - Develop a CEV to transport beyond low Earth orbit, the first new U.S. space flight vehicle since the 1960s.
  - Undertake first test flight by the end of this decade to provide an operational capability to support human exploration missions no later than 2014.
- Lunar Exploration
  - Begin robotic missions to the Moon in 2008, followed by a period of evaluating lunar resources and technologies for exploration.
  - Begin human expeditions to the Moon in 2020-2025 timeframe
- Mars Exploration
  - Conduct robotic exploration of Mars to search for evidence of life, to understand the history of the solar system and to prepare for future human exploration.
  - Timing of human missions to Mars will be based on availability budgetary resources, experience and knowledge gained from lunar exploration, discoveries by robotic spacecraft at Mars and other solar system locations, and development of required technologies and strategies.
- Other Solar System Exploration
  - Conduct advanced telescope searches for Earth-like planets and habitable environments around other stars.
- Terraforming
  - Conduct advanced telescope searches for Earth-like planets and habitable environments around other stars.
- Exploration Capabilities
  - Develop and demonstrate power generation, propulsion, robotics and other key capabilities to support more distant, more capable and/or longer-duration human and robotic exploration of Mars and other destinations.

Implementation begins now with key missions that are already in progress such as Mars exploration, visits to other solar system targets and Origins activities.