

New Visions and New Goals for the USA

Everybody needs a goal in life, researchers and technicians are no exception. Without a challenging long-term goal to work towards some of the enthusiasm in organisations like NASA could disintegrate. President George Bush set out to get some of that enthusiasm back in space research when he launched the "Vision for Space Exploration" in January 2004. So, what new goals lie ahead for the American researchers and technicians?

Most of the focus is concentrated around the plans for colonisation of the moon, but the vision covers more broadly, thus, based on Bush's vision, NASA has formulated a new strategy for the organisation, a strategy that covered all fields within space activities. The strategy was published in 2006 and had six main strategic goals.

The Vision for Space Exploration

The two first points of these visions are almost fulfilled; the Space Station is almost complete and the Space Shuttle has only few missions left. Thus, another epoch in the American space exploration programme is over and the new vision can be implemented. The third point is very comprehensive and interesting, and embraces most of the research programmes outside the moon exploration.

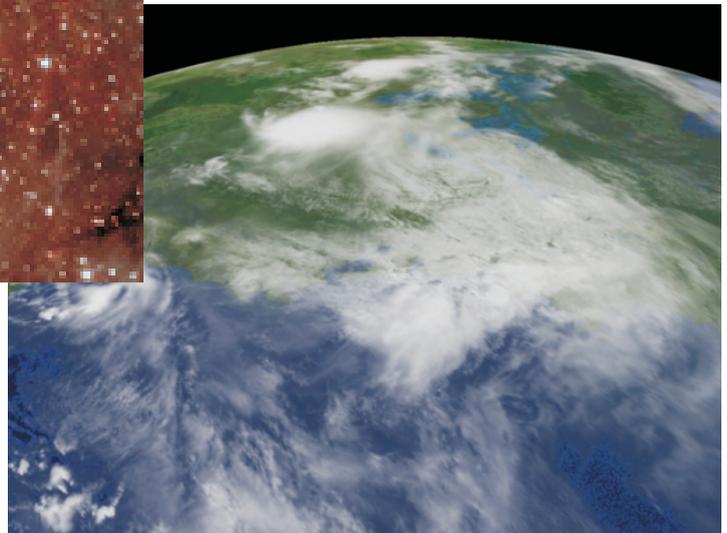
This strategy was set up during the former Administration in NASA; however, nothing suggests that the new Administration will change anything drastically. Both the new top administrators in NASA, Charles F. Bolden and his deputy Lori Garner, also held top level positions in NASA under the previous White House Administrations, and have likely participated in formulating the strategy.

The overall Science Plan

President Obama has recently introduced his first budget for NASA. The budget seems to be lower seen in relation to the budget from the previous administration; however, there are new trends to be seen. The complete budget from the earlier administration had a total increase of about 5.1 percent in relation to the current budget. The new budget decreases slightly in 2011 and holds

The vision

1. Fly the Shuttle as safely as possible until its retirement, no later than 2010
2. Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs for human exploration.
3. Develop a balanced overall program of science, exploration and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.
4. Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement.
5. Encourage the pursuit of appropriate partnerships with the emerging commercial space sector.
6. Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations.



NASA's goal is not only to look towards space, but also look from space towards earth

Above: One of the first pictures taken during Spitzer warm mission. Photo credit: NASA

Right: Low pressure over the Eastern coast of USA. Photo credit: NOAA

close to the same level through 2013. Thus, this may lead to smaller grants to the Constellation programme, something that may make it difficult to realise the ultimate dream of being the first to put a man on Mars, as well as back on the moon in 2020. Interestingly enough, however, is that the budget increases the spending on the Earth Science Programme in the years to come.

Space Research

With regard to the budget for 2010, The Constellation Programme, together with the Space Shuttle and the International Space Station Programme, make 33 % of the total budget. However, this will decrease to only 18% when the Space Shuttle retires due to very high manufacturing costs in 2010. The other part of

NASA's budget, close to the same level of magnitude as the first part, constitutes the third point in NASA's strategy: "Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus at exploration". These posts constitute different types of Space Research programmes, both pointed towards earth versus space and from space towards earth. This part of NASA's budget will increase from the present level at 24% to 28 % of the total budget within the next few years. Approximately forty percent of this post is earmarked for Earth Science.

In the chapter for space research one will find that the entire project deals with exploration of space, not found in the Constellation programme. This point is divided in six sub-goals:

Space Research Goals

Study Earth from space to advance scientific understanding and meet societal needs.

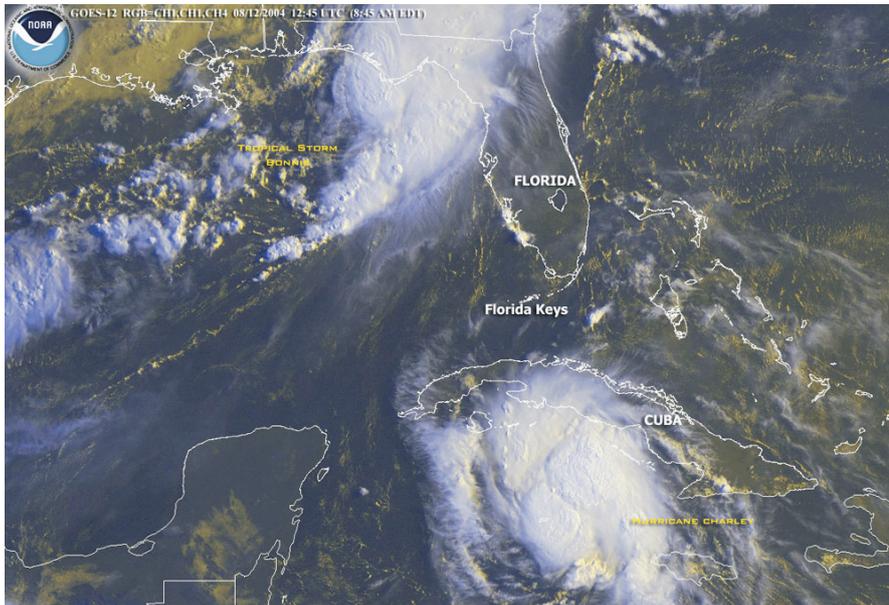
Understand the Sun and its effects on Earth and solar system.

Advance scientific knowledge of the origin and history of the solar system, the potential for life elsewhere, and the hazard and the resources present as humans explore space.

Discover the origin, structure, evolution and destiny of the universe, and search for Earth-like planets.

Advance knowledge in the fundamental disciplines of aeronautics, and develop technologies for safer aircraft and higher capacity airspace systems.

Understand the effects of the space environment on human performance, and test new technologies and countermeasures for long-duration human space exploration.



Hurricanes threaten Cuba and Western Florida. Hurricanes have been observed more frequently in recent years, however, NOAA's forecasting ability has improved equally. Photo credit: NOAA

The Earth Observation Programmes

In spite of the fact that the USA is regarded as a latecomer within the field of environmental protection, the country is the leading country within the research field of Earth Science. At present, NASA will deploy the next generation of advanced observing and research capabilities, missions that no doubt will provide a greater understanding of relations between human activities and the climate. NASA is responsible for developing, building, launching and managing the platforms that deliver earth observation data, while organisations like NOAA is the operational organisations that provide services for the society.

NASA's programmes in Earth Science are also central to three presidential initiatives; the Climate Change Research Initiative, Global Earth Observation, and the Oceans Acton Plan. NASA also pioneers new global environmental research and observations together with other federal agencies to improve services in fields such as weather forecasting, climate prediction, natural hazard assessment, prediction, and response, and environmental management, including air quality forecasting.

NASA has earlier in this decade deployed the Earth Observation System

(EOS), the world's most advanced and comprehensive capability to measure global change. Thus, this period will be about analyzing EOS data to characterise, understand and predict variability and trends in the earth's system and provide background data for the politicians who ultimately make the political decisions.

Space Research

Three of the points in the strategy are related to what most people usually regard as space research – knowledge more about the universe, the origin, the evolution and how space affect people on earth. Within these fields one finds well - known missions such as the Hubble Space Telescope, the Mars Probes, Cassini with Saturn and observatories such as Spitzer, Kepler and Fermi. At present, probes on the way to their destinations are Messenger, which will orbit Mercury in 2011, and New Horizons, scheduled to arrive Pluto in 2015. Additionally, one finds projects in the developing/building phase such as the James Webb Telescope and the Mars Science Laboratory. The USA has for the most part held and most likely still will hold its leading role within these fields, however, there will still be cross-border cooperation and international participation. The ESA is involved in quite a few, and mentioned can be the Swedish involvement in the Fermi telescope.

As a part of the space research, and as a basis for human exploration, the organisation also has ongoing projects aimed at understanding the long-time effects on astronauts who participate in missions over an extended period of time, thus finding ways to better protect the astronauts.

Finally, though somewhat on the side of space activities, NASA is also engaged in developing technology connected to improve safety on board aircrafts using technologies common for space and air transportation.



This sweeping mosaic of Saturn's moon Enceladus has not been possible without an active space research community. Photo credit: NASA/JPL/Space Science Institute