Goddard Space Flight Center

Annual Report

2002

On January 16th, *we saw our loved ones launch into a brilliant, cloud-free sky. Their hearts were full of enthusiasm, pride in country, faith in their God, and a willingness to accept risk in the pursuit of knowledge — knowledge that might improve the quality of life for all mankind. Columbia's 16-day mission of scientific discovery was a great success, cut short by mere minutes — yet it will live on forever in our memories. We want to thank the NASA family and people from around the world for their incredible outpouring of love and support. Although we grieve deeply, as do the families of Apollo 1 and Challenger before us, the bold exploration of space must go on. Once the root cause of this tragedy is found and corrected, the legacy of Columbia must carry on — for the benefit of our children and yours.*

The Families of Columbia
February 3, 2003

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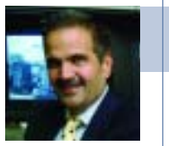
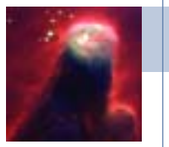
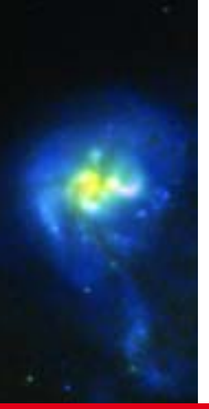
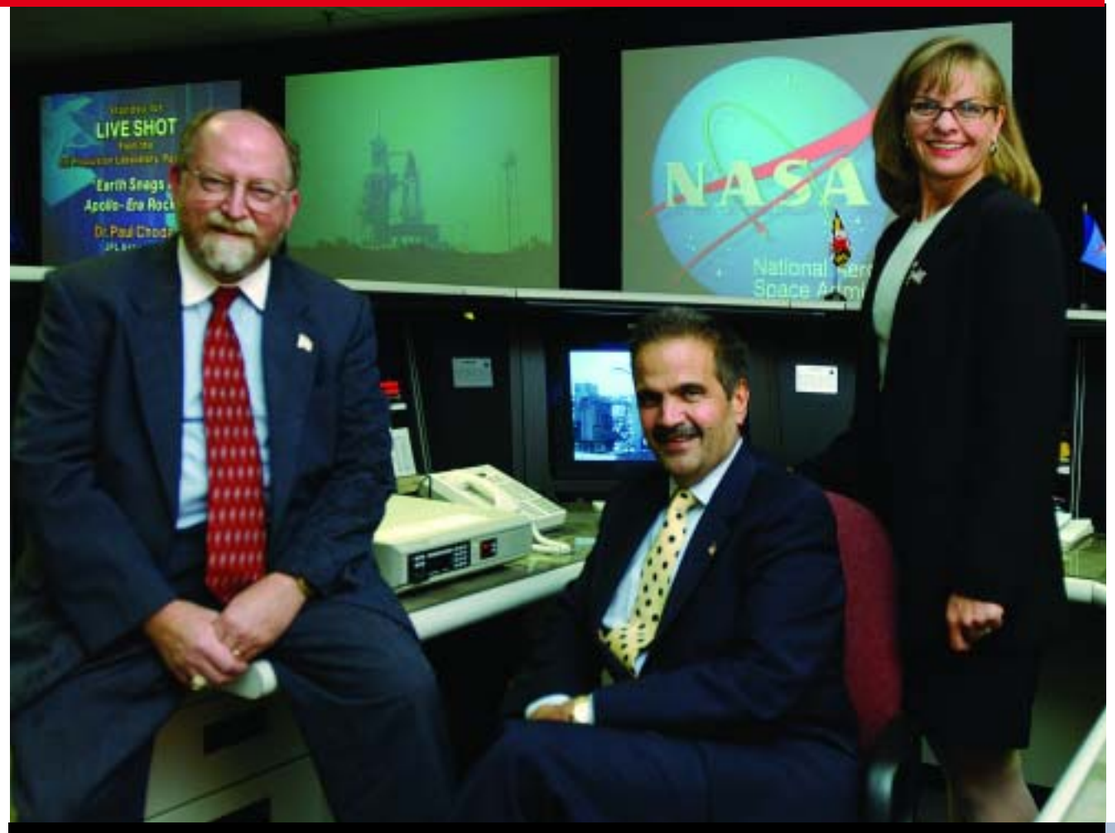






The Near Infrared Camera and Multi-object Spectrometer took this image of a galactic smash-up involving four galaxies located in the distant universe. Called IRAS 19297-0406, the colliding system glows fiercely in infrared light because new stars are forming in the resulting dust.



W.F. Townsend
Deputy Director

A.V. Diaz
Director

Alison McNally
Associate Director

Director's Message

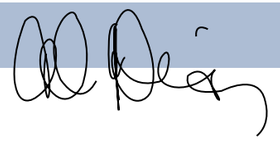
Carrying Out NASA's Bold Vision

In 2002, NASA Administrator Sean O'Keefe articulated a clear and compelling vision for the Agency: To improve life here, extend life to there and find life beyond. It resonates with employees, the aerospace community, and the public because it frames what NASA chooses to investigate and how to carry out its missions.

In this report, you will find many examples of how our people in Greenbelt, Maryland, the Wallops Flight Center in Virginia, Goddard Institute of Space Studies in New York, and the Independent Verification and Validation Facility in Fairmont, West Virginia, put that vision to work.

Among many other things, last year we successfully launched seven spacecraft designed to execute investigations that only NASA has the experience to perform. You also will read about our employees — our most valued resource. People work, visit, and find opportunities to connect with us because we seek excellence and accomplishments. Our campus-like environment invites a quality of worklife that respects individual needs. To meet the Agency's quest to explore and generate scientific knowledge, Goddard collaborates with every Center in the Agency.

In closing, join us in recognizing the many individuals who dedicate so much of themselves to the pursuit of scientific and engineering excellence, creating a legacy of scientific knowledge that will endure, in the achievement of NASA's vision.



Landsat 7, the latest in the nation's long-running Earth remote-sensing satellite system, captured this image of the Chesapeake Bay area.

Defining the Mission

NASA's Mission

Understanding and protecting our home planet

Exploring the universe and searching for life

Inspiring the next generation of explorers

…as only NASA can

NASA's Vision ***To improve life here, To extend life to there, To find life beyond***

The colliding galaxies shown in this Hubble image are nicknamed "the Mice" because of the long tails of stars and gas emanating from each galaxy. Otherwise known as NGC 7676, the pair will eventually merge into a single giant galaxy. This celestial dance was found 300 million light-years away in the constellation Coma Berenices.

This year, NASA established a new vision that sets the pace and focus for the Agency in the years to come. As one united organization, NASA has committed itself to a mission of understanding and protecting our home planet, exploring the universe and searching for life, and inspiring the next generation of explorers…as only NASA can.

In 2002, the Goddard Space Flight Center did its part to fulfill that bold mission.

Scientists observed the smallest ozone hole ever over the Antarctic and discovered the presence of water ice just below the Martian surface. The now-legendary Hubble Space Telescope, which astronauts serviced in a complex series of space walks in 2002, detected and analyzed the atmosphere of a planet 150 light-years away.

Goddard launched Aqua, another in the series of Earth Observing System (EOS) spacecraft, and TIMED, a university-built and -operated spacecraft that studies the influences of the Sun on the mesosphere and lower thermosphere/ionosphere — the least explored and understood portion of Earth's atmosphere. NOAA-17 and two Tracking and Data Relay System satellites achieved orbit, as did RHESSI, a mission named

Plumes of smoke are identified in this Terra spacecraft image. Knowing the location of fires helps firefighters to allocate their resources better.

after Reuven Ramaty, a Goddard scientist who provided the original scientific justification for the mission of studying the Sun's production of solar flares, the most intense explosions in our solar system.

Working with the Jet Propulsion Lab in California, Goddard personnel oversaw the integration of three instruments on board the Space Infrared Telescope scheduled for a spring 2003 launch. Instruments included the Goddard –built Infrared Array Camera.

Marking another milestone, a Goddard team successfully completed the construction of a massive "coded aperture mask," a critical element of the Burst Alert Telescope that will fly on NASA's latest gamma-ray burst spacecraft called Swift. The mask is the largest such device ever built and will play a key role in precisely locating the origin of gamma-ray bursts, the most powerful events in the universe.

The EOS data management system — EOSDIS — made headlines, too, earning the distinction of becoming the world's single largest repository of information. This is noteworthy not because of its size at 2,000 terabytes of data — which is 100 times larger than the Library of Congress — but because of the new knowledge it will likely generate.

In other supercomputing news, the Center's HP AlphaServer SC 45 computer system — named after Dr. Milt Halem, the former Director of Information Sciences — earned the ranking of 18 in the 20th edition of the "TOP 500" list of the world's most powerful computing systems. The Hewlett Packard system handles billions of calculations per second. Working with the Ames Research Center in California provides Goddard enhanced capabilities in computational research for Earth and space science applications.

2003 Missions

Ice, Cloud and land Elevation Satellite (ICESat) and Cosmic Hot Interstellar Plasma Spectrometer (CHIPS)

STS-107, Fast Reaction Experiments Enabling Science Technology Applications and Research (FREESTAR) Hitchhiker

Solar Radiation and Climate Experiment (SORCE)

Galaxy Evolution Explorer (GALEX)

Space Infrared Telescope Facility (SIRTF) / Infrared Array Camera (IRAC)

All-Canadian Science Satellite, SCISAT-1

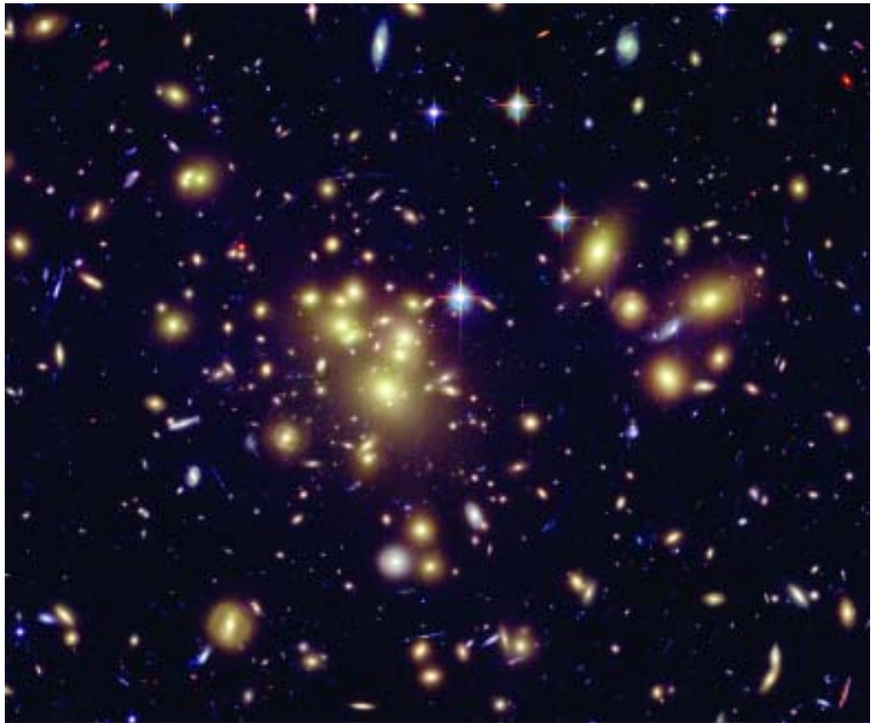
Coupled Ion-Neutral Dynamics Investigation (CINDI)

Swift

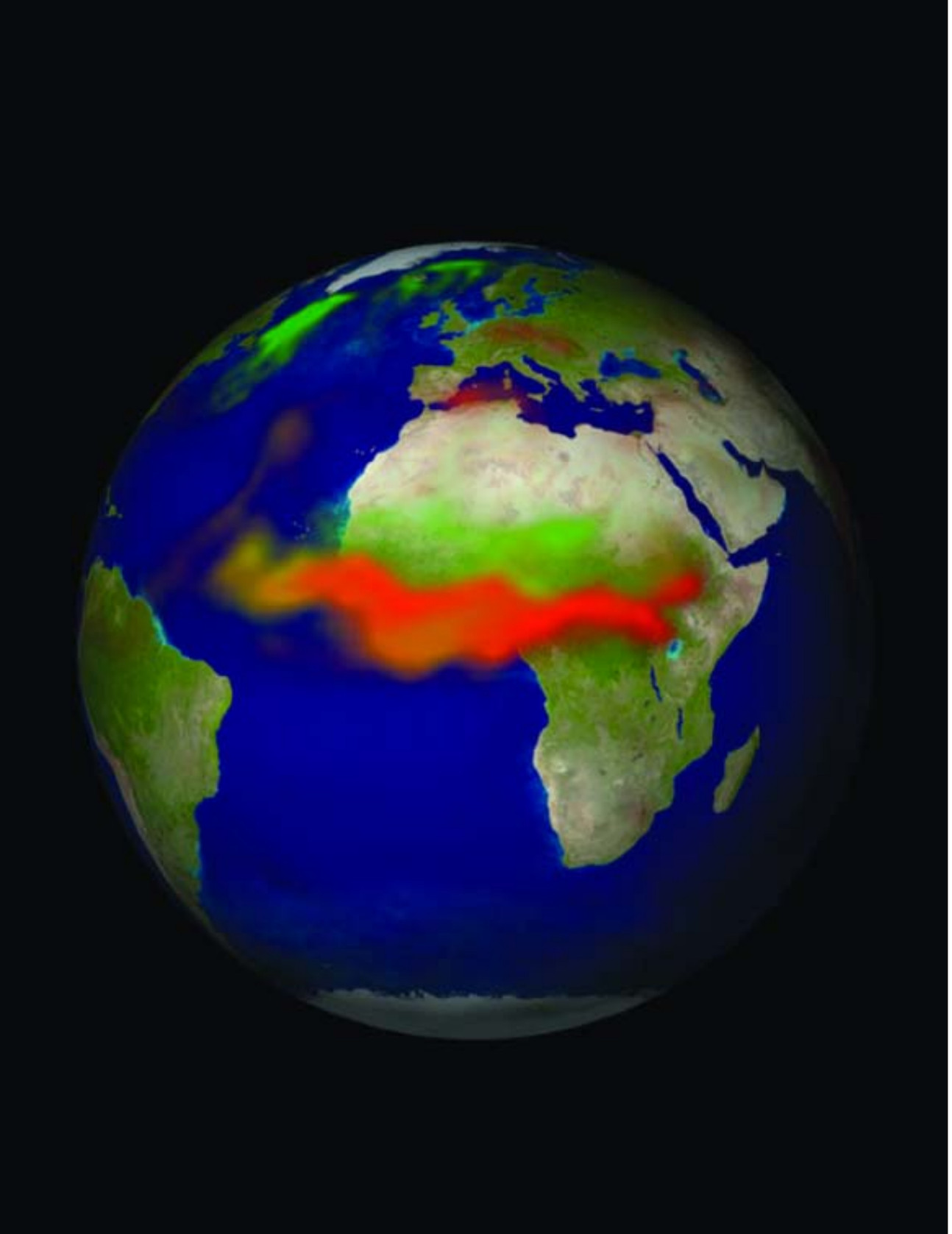
NASA's Integrated Financial Management Program will modernize the Agency's financial and administrative systems and processes. Goddard is leading the development of the Core Financial module, the backbone of the system, which will provide timely, consistent and reliable information for accounting and budgeting decisions, and will facilitate improved information exchange with NASA's Centers and vendors laying the foundation for NASA's e-commerce and e-Government initiatives.

To improve efficiency of Agency operations, Goddard's Regional Finance Office provides accounting, financial and funds-control services in support of NASA Headquarters and the Jet Propulsion Laboratory, as well as Goddard, which together account for approximately 35 percent of the Agency's budget. The consolidation at Goddard was part of an ongoing effort to consolidate functions in the finance arena and to streamline NASA's business practices.

Working closely with NASA Headquarters' organizations, GSFC's Procurement Office provided contractual support to enable each Enterprise's mission, assisting in strategic planning, procurement planning, industry assistance and counseling, and the placement, administration and close-out of contractual vehicles and an array of services needed to perform the Agency's mission.



This Hubble Space Telescope image taken with the spacecraft's newly installed Advanced Camera for Surveys shows a menagerie of galaxies in the distant universe and offers a hint of what the next-generation James Webb Space Telescope will be able to see when NASA launches it in 2010.



This map, created with Terra Moderate-resolution Imaging Spectroradiometer (MODIS) surface reflectance and model data, shows the presence of aerosols in the atmosphere. The green hues indicate the location of natural particles, such as wind-blown desert dust, while the red areas indicate aerosols, most likely the result of biomass burning. The gold areas indicate a mixture of the two. Goddard scientists plan to incorporate Terra data into more sophisticated computer models to monitor the effects of aerosols on a global scale.

Understanding and Protecting Our Home Planet

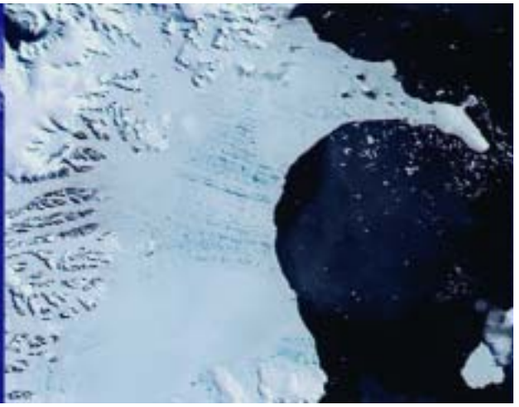
The first element in NASA's mission statement — to understand and protect our planet — is as multifaceted as the planet itself. NASA's principal thrust in carrying out this mission is the collection of data that decision makers need to understand Earth's complex climate and develop policies aimed at protecting it. Protection of the home planet also includes sharing NASA's unique technology and imagery with others for the betterment of all.

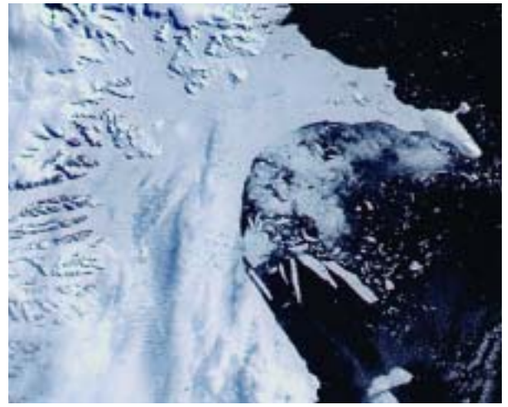
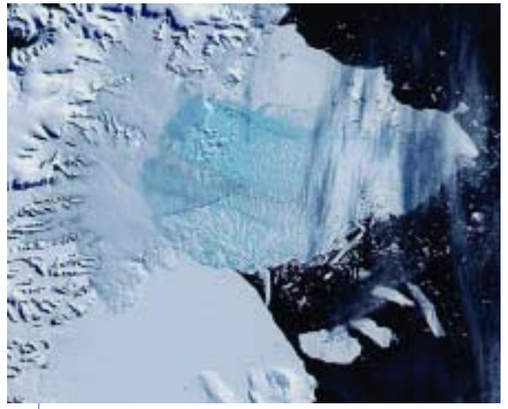
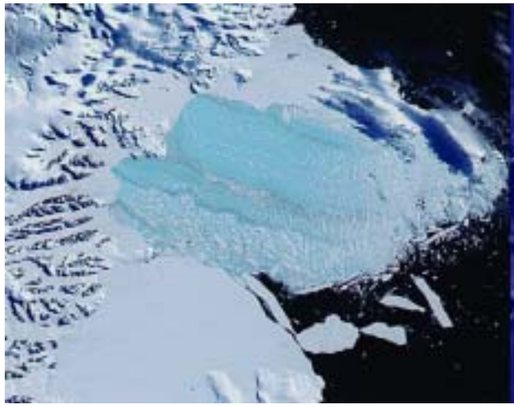
Understanding the Earth System and Its Response to Natural and Human-Induced Changes

Signs that Earth's climate is undergoing change abounded in 2002.

Satellite data since 1998 indicate that the bulge in the Earth's gravity field at the equator is growing. Goddard scientists reported in 2002 that they believe this change may represent large-scale changes in Earth's climate, caused by a significant amount of ice or water moving from the higher latitudes to the equator and redistributing the ocean mass.

Scientists are hopeful that Gravity Recovery And Climate Experiment (GRACE 1 and GRACE 2) — a dual-payload gravity mission accomplished with the Jet Propulsion Laboratory — will provide more clues as the mission maps variations in the Earth's gravity field over its 5-year lifetime. The Geoscience Laser Altimeter System instrument, which is flying on NASA's ICESat, also could prove invaluable. It precisely measures to within a centimeter the size of the ice sheets to determine whether they are growing or shrinking and whether they can cause rapid changes in sea level. Thanks to colleagues at the Kennedy Space Center in Florida, each of these payloads was successfully delivered to orbit ready for check out.



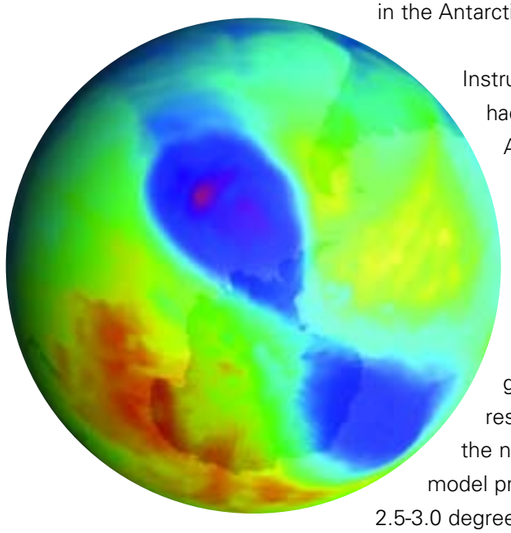
This series of images taken by Terra's Moderate Resolution Imaging Spectroradiometer (MODIS) shows the dramatic collapse of the northern section of the Larsen B ice shelf, a large floating ice mass on the eastern side of the Antarctic Peninsula — evidence of rising temperatures.

Warmer Temperatures

Understanding ice sheets and the distribution of the ocean mass are crucial. The enormous Larsen ice shelf in Antarctica, in existence since the last Ice Age 12,000 years ago, began to collapse into the ocean, offering stunning evidence that temperatures are rising and affecting the polar caps.

Another tangible sign of Earth's changing climate — particularly in the form of warmer temperatures — appeared a few months later. Scientists from Goddard and the National Oceanic and Atmospheric Administration confirmed that the Antarctic ozone hole in September was much smaller than it was in 2000 and 2001. Another first, researchers also announced that the hole had split into two, a scientific anomaly. Goddard scientists attributed this unusual ozone activity to warmer-than-normal temperatures in the Antarctic.

NASA and the National Oceanic and Atmospheric Administration confirmed that the ozone hole over the Antarctic (depicted in blue) was much smaller in 2002 than it was in 2000 and 2001, and that it split into two separate holes — something that has never happened before.



Instrumental data confirmed what scientists had observed with Goddard spacecraft. According to researchers with the Goddard Institute for Space Studies (GISS), 2002 recorded the second warmest global surface temperature in more than a century of data gathering.

Using different assumptions about greenhouse gas emissions, GISS researchers also projected warming over the next 50 years. Their computer climate model predicts a global warming of about 2.5-3.0 degrees Fahrenheit (-16.3 to -16.1 Celsius) if greenhouse emissions continue to accelerate. If carbon dioxide and air pollution emissions level off at current values, the study finds that temperatures will rise by only 1.0-1.5 degrees Fahrenheit (-17.2 to -16.9 Celsius).

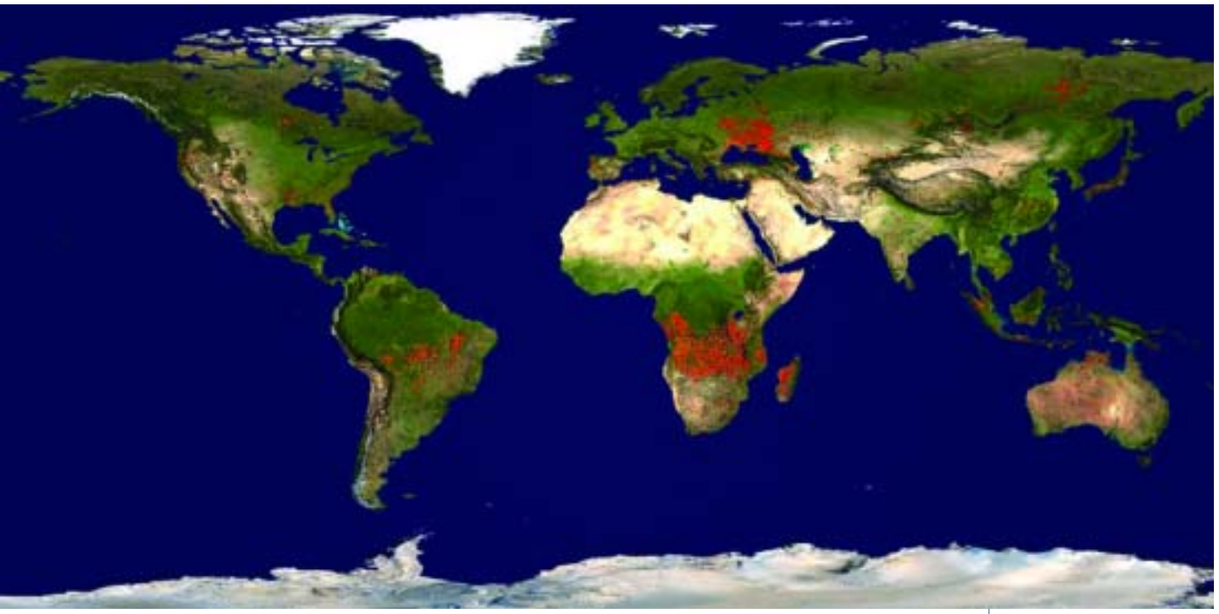
Climate Change: Human-Induced or Natural?

For years, debate centered on whether global warming could be attributed to human-induced pollution or natural causes. Driven by precise new spacecraft measurements by Terra's Moderate Resolution Imaging Spectroradiometer (MODIS) instrument and sophisticated new computer models, Goddard scientists are routinely producing global maps that distinguish plumes of human-produced particulate pollution from natural aerosols. These measurements of pollution and smoke particles are important because, depending upon the type of particles produced, they can either warm or cool the climate and increase or decrease rainfall regionally.

Mapping the location of fires — a major source of pollution — represented another accomplishment for Goddard scientists. The dramatic new satellite maps show fire activity across the entire planet — a critical piece of information for understanding the impact of fire on life and climate.

Investing In and Sharing Technologies for the Betterment of All

MODIS fire imagery also helped Arizona firefighters better allocate their fire-fighting resources during the Rodeo-Chediski wildfire. This wildfire — the largest in Arizona history — destroyed more than 468,000 acres in the Apache-Sitgreaves National Forest and Fort Apache reservation.



This still image illustrates the distribution of active fires across the planet on July 11, 2002. Active fires detected by Terra's MODIS sensor are shown in red. Never before have scientists had the opportunity to map fire across the entire Earth with such detail, accuracy, and frequency.

Space technology also found an unlikely beneficiary in the world of speedskating. At the 2002 Olympic games in Salt Lake City, speedskater Chris Witty won a total of 11 medals in long- and short-track races. At the 1998 games in Nagano, Japan, Witty took home two medals. She attributed her success in Salt Lake City to a Goddard-developed polishing technology that gave her skates a 15 percent improvement in glide, while maintaining their razor-sharp edge.

Speedskater Chris Witty, who won 11 medals at the 2002 Olympic games in Salt Lake City, visited Goddard and explained how a Goddard-developed polishing technology gave her skates a 15 percent improvement in glide.

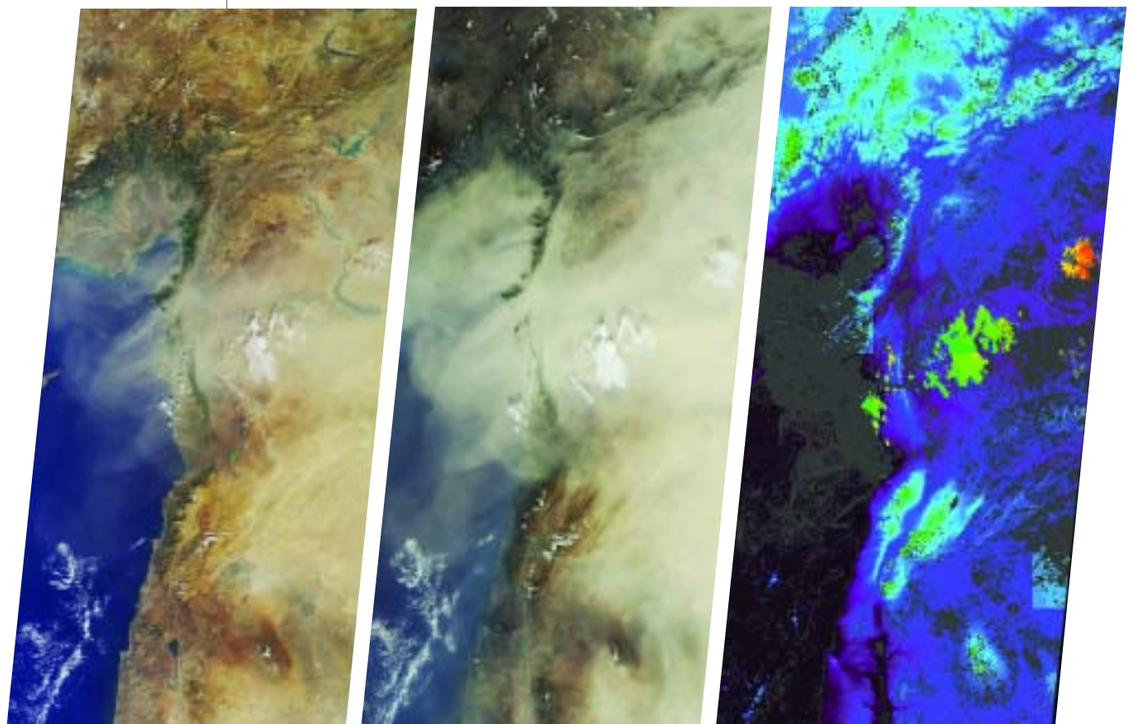
The new technology was based on the same principles used in polishing space optics. Because of the technology transfer made possible, Witty and others on the U.S. Olympic team skated into history.

NASA technology found its way into 20 different Baltimore City middle and high schools as part of a project aimed at determining the cause of pediatric asthma in Baltimore City. Using a device known as the "Sun Photometer," students and teachers gathered data to help determine the size and quantity of aerosols in the vicinity of their schools. This research initiative provided a first-time look at the distribution of aerosols across the city in relation to the incidence of asthma, one of the most common chronic illnesses in Baltimore.

These images, produced from data collected by Terra's Multi-angle Imaging Spectro-Radiometer, show a large dust cloud that extended across countries bordering the eastern Mediterranean Sea on October 18, 2002. This cloud was situated between about 1.2 miles (2 km) and 3.4 miles (5.5 km) above sea level, the data reveal.

NASA's Tracking and Data Relay Satellite-1 (TDRS-1), which is inclined 13 degrees and provides exclusive coverage over the Antarctic continent, proved its worth yet again. During the Antarctic winter, when travel to and from the continent is impossible, two doctors at Massachusetts General Hospital coached a doctor at the Amundsen-Scott South Pole Station during a 2-hour knee operation.

Other significant scientific investigations in areas such as land-atmospheric processes, atmospheric chemistry, aerosols, hydrology, meteorology, spacecraft formation flying, remote sensing and applications are achieved with the cooperation and support from other Centers such as Ames Research Center, Dryden Flight Research Center, Jet Propulsion Lab in California; Johnson Space Center in Texas, Langley Research Center in Virginia; and Stennis Space Center in Mississippi. Projects



This image taken by NASA's experimental spacecraft, EO-1, shows the swath of destruction that resulted after a tornado ripped through the town of La Plata, Maryland, in April 2002. The tornado registered 4 out of 5 on the Fujita scale making it the strongest in Maryland's weather history.

include joint effort in SeaWinds, SAFARI, GRACE, CloudSat, Quick Scatterometer, SOLVE, coastal studies, CERES, Calipso, network support and shuttle payloads, such as Freestar on STS 107.

Earth Observing-1 (EO-1) was launched successfully in 2000 to flight-validate a variety of new technologies aimed at lowering the cost and increasing the performance of future Earth science missions. The spacecraft's planned one-year mission was extended because of the high interest of the remote sensing research and applications community. As a result of the superior performance of the satellite's three imaging instruments and exceptional value of the collected data, an interim agreement was reached between NASA and the United States Geological Survey to continue EO-1 operations to augment the EO-1 scientific data base and promote technology applications.

Goddard's latest Earth Observing System spacecraft, Aqua, is launched aboard a Delta II rocket from the Western Test Range of Vandenberg Air Force Base. It previously was known as the EOS-PM platform. Aqua was launched May 4, 2002.

The Hubble Space Telescope's Near Infrared Camera and Multi-Object Spectrometer opened its "near infrared eyes" on the universe, snapping this view of a star-forming region in the Cone Nebula. The new image was released after space-walking astronauts installed a new cryocooler that restored life to the instrument.

Exploring the Universe

One of the fundamental questions NASA seeks to answer is: Are we alone? As part of its mission to explore the universe, NASA also is attempting to answer how we got here and where are we going.

How Did We Get Here?

It is a rare person who does not look out into the night sky and wonder. NASA's workhorse observatory, the Hubble Space Telescope, extended our view into space a little farther this year, Goddard personnel worked with the Johnson Space Center in Texas to ensure that space-walking astronauts could install the Advanced Camera for Surveys and a Goddard-developed cryocooler to restore the observatory's Near Infrared Camera and Multi-Object Spectrometer (NICMOS).

The cryocooler's development was critical to astronomers. Peering back to the edges of space to observe the universe as it appeared shortly after the Big Bang and seeing through the clouds of dust and gas that block astronomers' view in visible light require the ability to see in the infrared. To detect these faint photons of light, an instrument's detectors must operate at extremely cold temperatures, but the original coolant on NICMOS evaporated, making the instrument dormant.

Determined not to be defeated, Goddard scientists and engineers devised a plan to restore NICMOS and its ability to detect near-infrared light. They turned to a new mechanical cooling technology, jointly developed with the U.S. Air Force. Operating on principles similar to a modern home refrigerator, the cryocooler pumps ultra-cold neon gas through the internal plumbing of the instrument. At its core are three, high-tech turbines that spin at rates of up to 430,000 rpm.

The fix will keep NICMOS working until the Hubble retires later this decade and is replaced by a follow-on telescope, now known as the James Webb Space Telescope (JWST).

In September, NASA announced the selection of TRW as the prime contractor to build Hubble's technological and scientific successor. When launched in 2010, JWST will give scientists at Goddard, Jet Propulsion Laboratory and elsewhere an even better view into space and time, allowing the analysis of miniscule specks of light that Hubble cannot detect.

Astronomers used the Hubble Space Telescope to measure the velocities of stars whirling around the crowded core of this globular cluster, G1, located 2.2 million light-years from Earth in the Andromeda galaxy. There, they found a medium-size black hole. Astronomers believe that if G1 contains a black hole now, it most likely contained one when the galaxy formed billions of years ago.

And yet another of NASA's Great Observatories significantly contributed to the world of science. Nearly 90 years after Albert Einstein described gravity as the warping of space-time, scientists using data gathered by NASA's Chandra X-Ray Observatory — managed by the Marshall Space Flight Center in Alabama — and the European XMM-Newton discovered that light emanating near a black hole lost its energy as it climbed out of a gravitational well created by the black hole. The observation showed that the black hole's powerful gravity warped the space and time next to it, allowing yet another of Einstein's insights to stand the test of time.

Another technological marvel that is proving its worth to scientists in their quest to understand the universe is the long-duration balloon developed at the Wallops Flight Facility. Made of thin polyethylene material about the same thickness of ordinary sandwich wrap, the balloon is larger than a football field and flies near the edge of space for longer periods of time than traditional scientific balloons, giving scientists more time to gather data.

One such balloon set a new flight record of nearly 32 days after completing two orbits around the South Pole. Carrying the Trans-Iron Galactic Element Recorder experiment, which scientists designed to search for the origin of cosmic rays, the helium-filled balloon ultimately traveled 8,800 miles (14,162 km), collecting a significant number of rare cosmic ray elements likely forged in supernova explosions.

A few months later, another scientific balloon set a different record. Carrying a solar and heliosphere experiment called Low-Energy Electrons, it drifted to the upper edges of the atmosphere above Manitoba, Canada. The balloon reached a peak altitude of 161,000 feet (49,073 meters) and a volume of 60 million cubic feet (1.7 million cubic meters) — making it the largest balloon ever launched successfully.

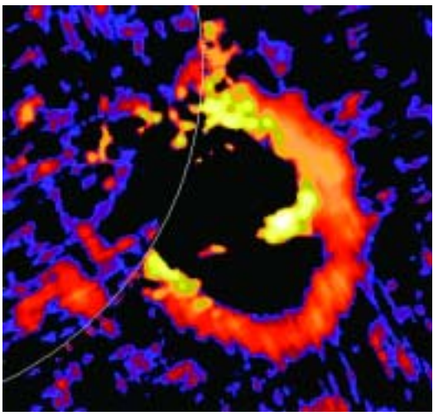
Another technological marvel proving its worth to scientists in their quest to understand the universe is the long-duration balloon seen in the distance of this photo.

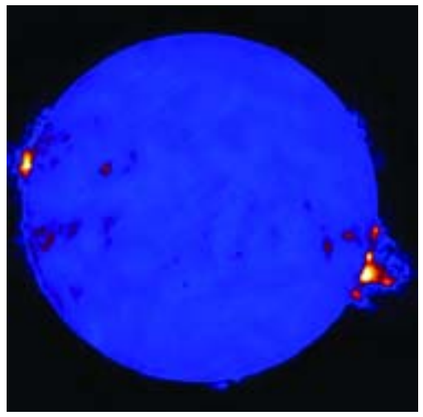
Where Are We Going?

Our planet depends on the light and energy the Sun provides. Without the Sun, life as we know it on Earth would cease to exist. Consequently, understanding the mechanics of the Sun and its impact on the Earth has always been a key focus at Goddard.

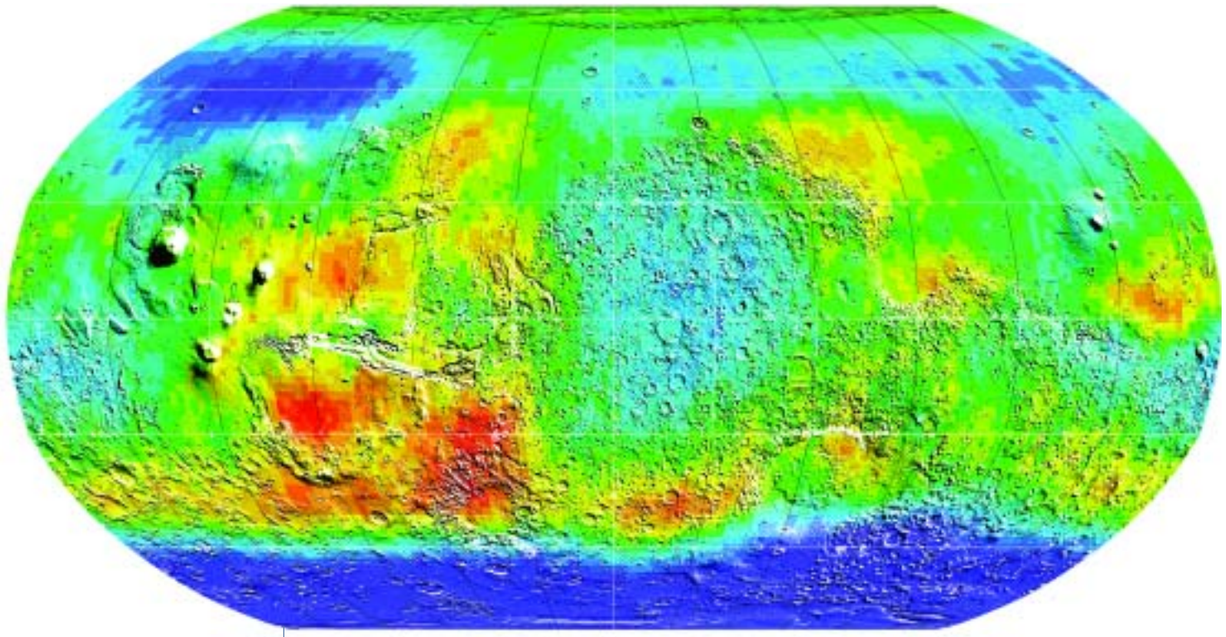
Goddard scientists announced that a solar eruption, called a Coronal Mass Ejection (CME), that appeared to hit Earth head-on actually originated on the backside of the Sun and expanded sideways to the Earth. CME eruptions can hurl a billion tons of electrified gas into space at a million miles per hour. Solar astronomers watch the Sun closely for these Earth-directed CMEs because they can generate severe space storms, adversely affecting communications, power grids, and space-walking astronauts. This new insight led scientists to broaden their view of what constituted a potential threat.

Another Goddard spacecraft, the Imager for Magnetopause to Aurora Global Exploration, also provided the first global picture of the role that Earth's outer atmosphere plays in space storms, which occasionally disrupt spacecraft — a significant discovery given earlier beliefs that the solar wind was solely responsible. The spacecraft also was selected as one of the top five finalists for the NASA Continuous Improvement Award. Goddard is collaborating with NASA's Marshall Space Flight Center and the United Kingdom's Particle Physics and Astronomy Research Council on a





Goddard scientists discovered that the Coronal Mass Ejection shown in this series of photos originated on the back side of the Sun and expanded sideways to strike Earth. Although it was not a head-on blow, its billion tons of electrified gas were powerful enough to generate a moderate space storm, which can disrupt communication and power grids on Earth.



In this map created from data gathered by the gamma ray spectrometer on NASA's 2001 Mars Odyssey, the deep blue areas indicate soil enriched by hydrogen. Scientists believe that the polar regions contain up to 50 percent water ice in the upper 3 feet (1 meter) of the soil.

future Sun-observing spacecraft called Solar-B. Led by Japan's Institute of Space Science, Solar-B will measure the Sun's magnetic field and ultraviolet/X-ray radiation to increase the understanding of the sources of solar variability.

Are We Alone?

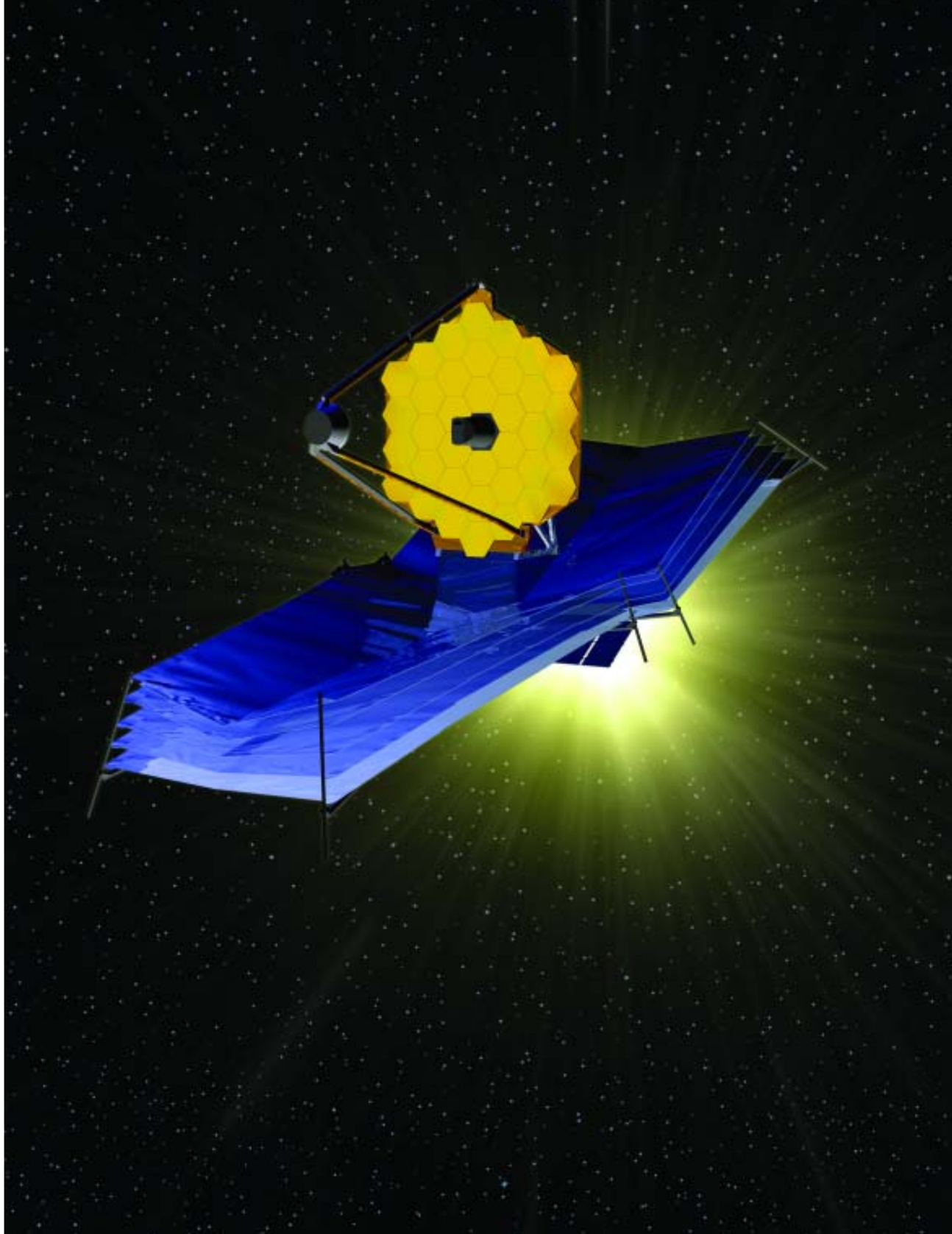
People always have wondered whether Mars supported life. Scientists using the Gamma-Ray Spectrometer on the 2001 Mars Odyssey announced they found enormous quantities of water ice — enough to fill Lake Michigan twice over — just under the surface of this seemingly barren sister planet. The discovery could not have happened without the instrument, whose technologies represented years of work begun at Goddard during the Apollo days. The discovery also begged the question: What happened to Mars? Did the planet once support oceans, lakes, and streams? Did it once support life? Does it now? Discovery of water offers a clue, and underscores the need to continue searching.

The question of whether we are alone was asked again in 2002, when astronomers discovered a circumstellar disk around a still-

forming star just 450 light-years from Earth in the direction of the constellation Taurus. These disks contain gas and dust that have not fallen into the star and are believed to be the birthplace of planets. Made with the Goddard-designed Space Telescope Imaging Spectrograph, the observation shows gaps in the disk — regions where planets may be forming.

Perhaps more compelling was an earlier announcement that Hubble directly detected and analyzed the atmosphere of a planet outside the solar system. The unique discovery of sodium in the atmosphere of a planet that orbits a yellow, Sun-like star 150 light-years away demonstrated that it was possible to measure the chemical makeup of a planet's atmosphere and search for chemical markers of life beyond Earth.

During the Hubble Space Telescope Servicing Mission, astronauts installed the new Advanced Camera for Surveys and a Goddard-built cryocooler that restored life to the observatory's Near Infrared Camera and Multi-object Spectrometer.



NASA selected TRW, now known as Northrop Grumman Space Technology, to build the more technologically advanced James Webb Space Telescope, which is depicted here in an artist's rendition.

Twenty-two schools from Maryland, Virginia, Rhode Island and Pennsylvania visited the Maryland State Fair to compete in the Goddard-sponsored FIRST (For Inspiration and Recognition of Science and Technology) contest. Their robots ran obstacle courses and performed other sporting-like feats to determine which team built the best robot.

Inspiring the Next Generation of Explorers

NASA intends to pursue its interests to understand and protect Earth, explore the universe, and search for life with talented and skilled people in the organization and with those entering the critical fields of mathematics and science.

The Agency re-energized its focus on education in 2002, viewing the mission of inspiring the next generation of explorers as an imperative to meet our goals.

Motivating Students to Pursue Careers

Goddard is a perennial sponsor of area high schools competing in the FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition. For six weeks, students across the country brainstorm, design, construct, and test their robots, all built from a standard kit of parts. Engineers and technicians from Goddard mentor a number of local teams. Their hard work pays off when they meet in regional competitions, and a national tournament, complete with cheering onlookers, cheerleaders, and referees. In 2003, Goddard is helping to organize the first ever FIRST Chesapeake Regional Tournament at the U.S. Naval Academy in Annapolis, Md. NASA's emphasis on education found a receptive home at Goddard, which in 2002 interacted with more than 7,000 students and educators on campus and another 100,000 individuals across the Northeast through its educational programs ultimately aimed at encouraging young people to pursue technical careers.

For six weeks in the summer, for example, 25 academically talented high school students reported to Greenbelt, and five to Wallops Flight Facility, to learn firsthand what it was like to work as a scientist as part of the National Space Society's "Space Scholars" program.

Another group of young people worked directly with Goddard's top science and engineering professionals through the Summer High

School Apprenticeship Research Program, designed principally for minority students. During their 8-week internship, the students conducted cutting-edge research and worked on state-of-the-art equipment.

In addition, 20 middle school-age girls worked one-on-one with Goddard's women scientists, technicians, researchers and engineers as part of the Center's SISTER program. The mentoring program paired the girls with the Goddard professionals, who showed their students the different opportunities available in the fields of math, science, and technology.

Working with the Glenn Research Center in Ohio, Goddard is involved in the Science, Engineering, Mathematics and Aerospace Academy at the University of Maryland Eastern Shore. Students in grades three through twelve are involved in interactive group activities in the fields of mathematics, science, engineering and technology to ignite interest and provide encouragement for strengthening mathematics skills.

At the university level, 16 undergraduate students worked with Goddard's most innovative scientists and engineers as part of the NASA Academy, a 10-year-old program designed to expose students already interested in aerospace-related careers to a variety of job-related experiences. Following the 10-week program, four

As the year drew to a close, Goddard reached out to students young and old by exhibiting at NBC 4's "Digital Edge Expo" at the Washington Convention Center. In this image, visitors examine Earth imagery taken by NASA's highly successful Landsat spacecraft. Visitors to Goddard's booth were treated to robot demonstrations and vivid imagery of the ozone hole over the Antarctic and global fires. Channel 4 News featured Goddard's booth on its evening news.

of the students were chosen to fly microgravity experiments on NASA's KC-135 aircraft and another student was chosen to spend the winter of 2003 in Antarctica — evidence that the program succeeded in generating enthusiasm for science careers.

Six additional undergraduate students conducted research in the Space Sciences and Applied Engineering and Technology Directorates as part of Goddard's Undergraduate Student Researchers Program, which had its first 15-week fall session in 2002. In addition, Goddard re-instituted the Graduate Student Researchers Program Symposium, which attempts to reach a diverse group of promising students whose research interests are compatible with NASA programs in Earth science, space science, and aerospace technology.

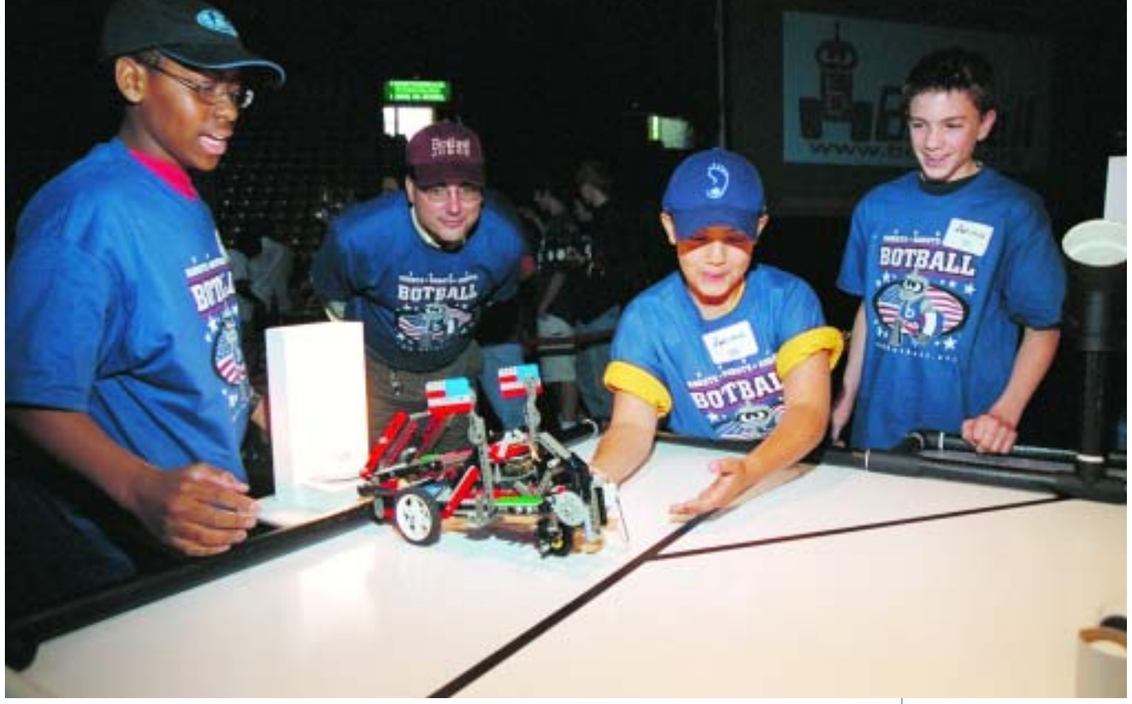
Providing Teaching Tools and Experiences

NASA's renewed focus on education also means providing teachers with the tools they need to teach math and science and to improve the country's scientific literacy. The Independent Verification and Validation Facility in Fairmont, West Virginia, for example, conducted 54 educational workshops involving more than 1,000 teachers, while the Greenbelt campus continued its partnerships across the Northeast, from Maine to the District of Columbia.

Making astronomy accessible to students with physical or learning challenges is the objective of this NASA-funded educational program in Howard County, Maryland. The program uses Internet technologies and other tools to teach the wonders of the universe.

Curriculum Development

The Endeavour Program, involves middle school students from Northeastern Pennsylvania, involving real-life space problems and presenting their solutions via videoconference to a panel of Goddard scientists. In one problem-solving challenge, students determined the best way to protect the Solar and Heliospheric Observatory from damage when it encountered the Leonid Meteor Shower in November.



At the 2002 D.C. Regional Botball Tournament held at George Mason University's Patriot Center and sponsored by Goddard, students from 59 area schools designed, built and programmed robots made entirely of Lego building blocks. They competed on a 4-foot by 8-foot (1.2-meters by 2.4-meters) game board, scoring points by moving colored balls into scoring position. Equipped with sensors, the robots turned themselves on and off, reacted to their opponents, and maneuvered on the game board without the use of remote controls.

In Anne Arundel County, Maryland, meanwhile, high school students are now studying Earth science as a system, learning how the atmosphere, water, and land masses interact and relate to one another. NASA scientists use this systematic approach when planning their Earth science missions. Goddard educational experts provided content and teacher training, and according to the school system, the course is among the most popular science electives in the county.

Classroom Opportunities

Goddard scientists also devoted their time to work on the Jason Project. The popular multidisciplinary program, which uses NASA-unique communications technologies to bring science into the classroom, featured an expedition to the coldest and most remote regions of the planet. Entitled "Frozen Worlds," students examined current research in geology, glaciology, biology, astrobiology, oceanography, and climatology.

These programs are examples of how Goddard can demonstrate to teachers that science and discovery are fun and exiting. They draw on human inquisitiveness and give educators a first-hand look at how science really works.

Students from Eleanor Roosevelt High School in Greenbelt, Maryland, view computer model data about Earth's magnetosphere on a three-dimensional display. Interactive displays, such as this one, explain complicated data sets and scientific concepts to students.

In an important step in semiconductor processing, a Goddard engineer examines a photoengraved microelectronic detector array under a computer-controlled, high-magnification microscope to ensure that the many layers remain precisely aligned to within .00004 inches (.0001 cm).

Visiting Committees

Goddard Space Flight Center Visiting Committee

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Dr. Diana Natalicio
University of Texas
at El Paso
El Paso, Texas

Professor Eric J. Barron
Pennsylvania State University
State College, Pennsylvania

Dr. David Cooper
Lawrence Livermore National Laboratory
Livermore, California

Dr. Gary Melnick
Smithsonian Astrophysical Observatory
Cambridge, Massachusetts

Dr. Duncan Moore
University of Rochester
Rochester, New York

Information Science and Technology Visiting Committee

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John Baras
University of Maryland
College Park, Maryland

Len Bass
Carnegie Mellon University
Pittsburgh, Pennsylvania

Irene Qualters
MERCK

Dr. Sara Graves
University of Alabama
Huntsville, Alabama

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Space Telescope Science Institute
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Rochester, New York

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Dr. Holland Ford
Johns Hopkins University
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Lockheed Martin Corporation
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Ms. Nancy Vesper Hughes
Industry (Retired)

Dr. Jack W. Hugus
Industry (Retired)

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Cambridge, Massachusetts

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Penn State University
University Park, Pennsylvania

Dr. Megan Donahue
Space Telescope Science Institute
Baltimore, Maryland

Dr. Milt Halem
Goddard Space Flight Center
Greenbelt, Maryland

Dr. Robert Bentley
Mullard Space Science Laboratory
Surrey, United Kingdom

Dr. Terrance G. Onsager
NOAA Space Environment Center
Boulder, Colorado

Professor Patricia Reiff
Rice University
Houston, Texas

Mr. Pete Bracken
Gaithersburg, Maryland

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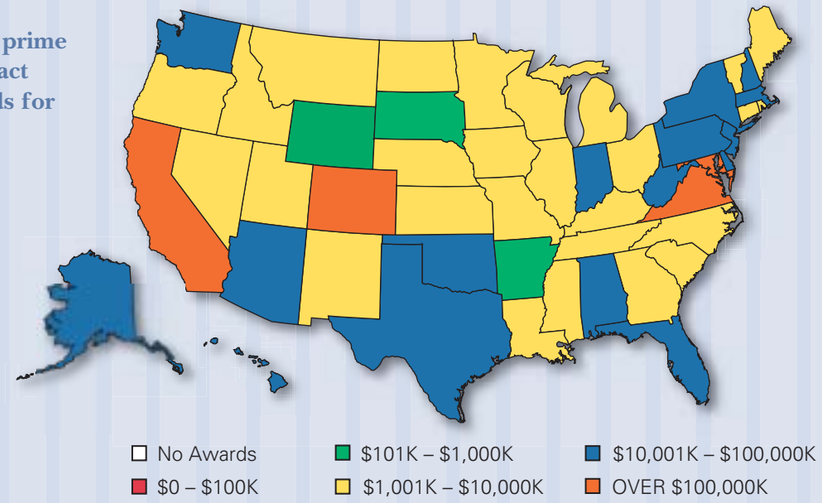
Goddard engineer examines the 52,000 lead tiles on the Swift spacecraft's Coded Aperture Mask, which allows scientists to pinpoint the location of gamma-ray bursts. The tiles block incoming gamma ray, casting a shadow on a detector below the mask.

Goddard Demographics and Financials

Total prime contract awards for FY02

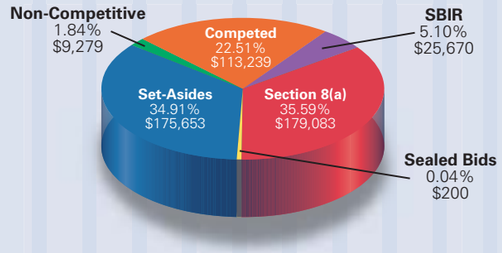


Geographical distribution summary for FY02. Obligations by state, place of performance

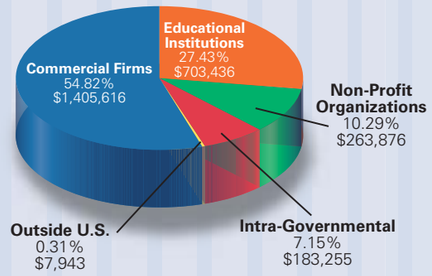
State	Total ($K)	State	Total ($K)
Alabama	$13,291	Montana	$6,565
Alaska	15,872	Nebraska	1,355
Arizona	31,575	Nevada	1,155
Arkansas	658	New Hampshire	12,223
California	354,887	New Jersey	51,187
Colorado	108,723	New Mexico	7,875
Connecticut	4,016	New York	33,993
Delaware	3,640	North Carolina	3,814
District of Columbia	14,181	North Dakota	2,430
Florida	15,446	Ohio	7,478
Georgia	4,141	Oklahoma	11,282
Hawaii	10,706	Oregon	6,356
Idaho	6,550	Pennsylvania	21,451
Illinois	8,769	Rhode Island	3,229
Indiana	35,911	South Carolina	4,053
Iowa	3,912	South Dakota	607
Kansas	1,734	Tennessee	9,057
Kentucky	1,820	Texas	50,122
Louisiana	1,673	Utah	3,503
Maine	1,284	Vermont	2,205
Maryland	1,060,675	Virginia	124,490
Massachusetts	45,765	Washington	13,879
Michigan	9,817	West Virginia	53,696
Minnesota	3,552	Wisconsin	8,289
Mississippi	1,051	Wyoming	721
Missouri	9,806	**TOTAL**	**$2,210,470**

Source: PR375PRC (Format F) Report *Excludes Purchases $25K*

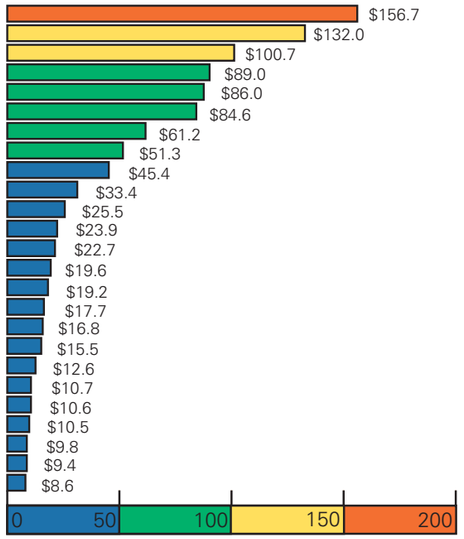
Distribution of awards to small and small disadvantaged business for FY02 obligations (in thousands)



Distribution of procurements for FY02 obligations (in thousands)

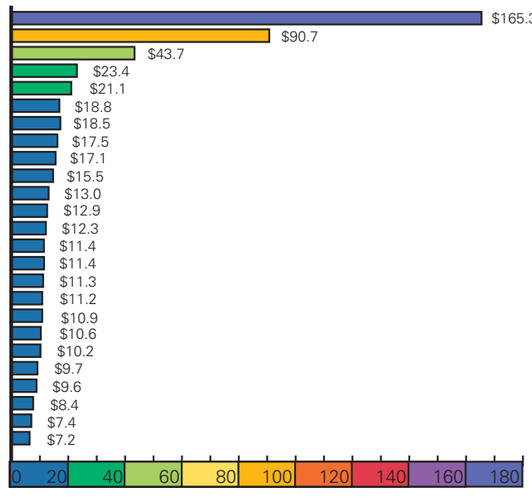


FY 02	FY 01	Company	Number of Contracts	Millions of Dollars Obligated
1	1	Lockheed Martin Corp.	27	$156.7
2	2	Raytheon Information Systems Co	1	$132.0
3	6	QSS Group, Inc.	4	$100.7
4	120	Boeing Satellite Systems, Inc.	1	$89.0
5	6	TRW, Inc.	7	$86.0
6	4	Swales & Associates, Inc.	4	$84.6
7	7	Science Systems Applications	10	$61.2
8	581	Northrop Grumman Systems Corp.	3	$51.3
9	8	Ball Aerospace & Tech. Corporation	11	$45.4
10	9	ITT Corporation	5	$33.4
11	12	P R C, Inc.	2	$25.5
12	61	Cube Corporation	1	$23.9
13	14	Cortez III Service Corporation	2	$22.7
14	15	Parsons Infrastruction & Tech.	2	$19.6
15	16	General Sciences Corporation	7	$19.2
16	11	Averstar, Inc.	2	$17.7
17	—	Mantech Systems Engineering Corp.	1	$16.8
18	18	Computer Sciences Corporation	28	$15.5
19	17	Spectrum Astro, Inc.	3	$12.6
20	26	SRS Information Services	1	$10.7
21	29	ITT Industries, Inc.	2	$10.6
22	10	NSI Technology Services Corporation	1	$10.5
23	22	L B & B Associates, Inc.	1	$9.8
24	20	Global Science & Tech., Inc.	7	$9.4
25	21	Honeywell Technology Sols., Inc.	15	$8.6



Top 25 Business Contractors for FY02

FY 02	FY 01	Institution	Number of Contracts	Millions of Dollars Obligated
1	1	Johns Hopkins University	125	$165.3
2	2	Assoc. of Universities for Res. in Astronomy	32	$90.7
3	3	University of Colorado – Boulder	192	$43.7
4	6	University of California – Berkeley	105	$23.4
5	4	California Institute Technology	83	$21.1
6	13	University of Maryland – Baltimore County	39	$18.8
7	5	University of Maryland – College Park	141	$18.5
8	8	New Mexico State University – Las Cruces	13	$17.5
9	20	Institute Software Research	6	$17.1
10	10	University of Alaska – Fairbanks	20	$15.5
11	7	Massachusetts Institute of Technology	92	$13.0
12	14	University of Arizona	128	$12.9
13	9	Smithsonian Institution	147	$12.3
14	18	Pennsylvania State University	54	$11.4
15	11	Columbia University	43	$11.4
16	20	Universities Space Research	34	$11.3
17	17	Southwest Research Institute	65	$11.2
18	19	Wheeling Jesuit College	5	$10.9
19	40	Oklahoma State University	3	$10.6
20	15	University of California – San Diego	69	$10.2
21	16	University of Hawaii	76	$9.7
22	22	Stanford University	35	$9.6
23	21	University of New Hampshire	60	$8.4
24	34	University of Michigan – Ann Arbor	69	$7.4
25	23	University of Washington	76	$7.2



Top 25 Nonprofit Institutions for FY02

Overview of the Goddard Space Flight Center's Financial Statements

The Fiscal Year (FY) 2002 Financial Statements have been formulated to present the financial position and results of operations of NASA, Goddard Space Flight Center (GSFC), pursuant to the requirements of the Chief Financial Officers Act of 1990 and the Government Reform Act of 1994. These statements include the Statement of Financial Position and the Statement of Operations and Changes in Net Position. The statements have been prepared from the official accounting and budgetary records of GSFC (Basic Accounting System and Fiscal System) in accordance with the form and contents prescribed by the Office of Management and Budget (OMB) Bulletin 94-01.

The statements should be read with the realization that they reflect the component of a sovereign entity; that liabilities not covered by budgetary resources cannot be liquidated without the enactment of an appropriation; and that payment of all liabilities, other than contracts, can be abrogated by the sovereign entity.

There are five direct appropriations included in GSFC's Financial Statements. The current appropriations are Human Space Flight (HSF), Science, Aeronautics and Technology (SAT), Mission Support (MS), and the Science, Space and Technology Education Trust Fund. The only noncurrent appropriation is Construction of Facilities (C of F). Actual expenses for all appropriations including Government and non-Government reimbursable activities are reflected in the Financial Statements for FY 2002.

Total Goddard Funding FY02 ($M)

Space Science	1,166.9
Earth Science	975.0
Aeronautics	4.3
Education Programs	147.0
Space Flight	205.5
Crosscutting Technology	88.3
Reimbursables	270.4
TOTAL	2,857.4

Funding for salaries, benefits and travel are included in each Enterprise.

Statement of Financial Position
As of September 30, 2002

	2002 (In Thousands of $)	2001 (In Thousands of $)
Assets		
Intragovernmental Assets:		
Fund Balance with Treasury (Note 2)	$ 1,759,160	$ 1,454,407
Accounts Receivable, Net (Note 3) – Federal Claims	9,613	12,598
Advances and Prepayments (Note 4)	16,898	18,119
Governmental Assets:		
Accounts Receivable, Net (Note 3) – Non-Federal Claims	2,527	2,402
Operating Materials & Supplies, Net (Note 5)	174,907	169,457
Property, Plant and Equipment, Net (Note 6)	1,712,178	1,942,057
Total Assets	**$ 3,675,284**	**$ 3,599,040**
Liabilities		
Liabilities Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Accounts Payable	$ 55,879	$ 32,908
Other Liabilities (Note 7)	113,374	30,058
Governmental Liabilities:		
Accounts Payable	474,912	590,701
Other Liabilities (Note 7)	10,939	19,363
Total Liabilities Covered by Budgetary Resources	**$ 655,104**	**$ 673,030**
Liabilities Not Covered by Budgetary Resources:		
Intragovernmental Liabilities:		
Other Liabilities (Note 7)	$ 669	$ 545
Governmental Liabilities:		
Other Liabilities (Note 7)	37,577	36,032
Total Liabilities Not Covered by Budgetary Resources	**38,246**	**36,577**
Total Liabilities	**$ 693,350**	**$ 709,607**
Net Position (Note 9):		
Balances:		
Unexpended Appropriations	$ 1,133,033	$ 814,320
Trust Fund Balance	50	166
Invested Capital (Note 9)	1,887,085	2,111,514
Cumulative Results of Operations	12	10
Future Funding Requirements	(38,246)	(36,577)
Total Net Position	**2,981,934**	**2,889,433**
Total Liabilities and Net Position	**$ 3,675,284**	**$ 3,599,040**

The accompanying notes are an integral part of these statements.

Statement of Operations and Changes in Net Position
For the Year Ended September 30, 2002

	2002 (In Thousands of $)	2001 (In Thousands of $)
Revenues and Financing Resources:		
Appropriated Capital Used	$ 2,630,673	$ 2,617,845
Revenues from Sales of Goods & Services		
To the Public	3,544	1,269
Intragovernmental	309,752	283,752
Other Revenues and Financing Resources	(1,107)	(128)
Less: Receipts Transferred to Treasury	1,107	128
Total Revenues and Financing Resources:	**$ 2,943,969**	**$ 2,902,866**
Expenses:		
Program or Operating Expenses:		
Current Appropriations:		
Science, Aeronautics and Technology	$ 2,141,107	$ 2,138,041
Human Space Flight	75,665	29,823
Mission Support	413,752	442,081
Trust Fund	115	150
Noncurrent Appropriations:		
Construction of Facilities	32	7,769
Reimbursable Expenses	313,296	285,021
Total Expenses:	**$ 2,943,967**	**$ 2,902,885**
Excess, (Shortage) of Revenues & Financing Sources Over Total Expenses	**$ 2**	**$ (19)**
Changes in Net Position		
Nonoperating Changes:		
Unexpended Appropriations	$ 318,713	$ 68,851
Trust Fund Balance	(116)	(59)
Invested Capital	(224,429)	(229,144)
Future Funding Requirements	(1,669)	(356)
Total Nonoperating Changes	**$ 92,499**	**$ (160,708)**
Excess, (Shortage) of Revenues & Financing Sources Over Total Expenses	**$ 2**	**$ (19)**
Net Position, Beginning Balance	**$ 2,889,433**	**$ 3,050,160**
Net Position, Ending Balance	**$ 2,981,934**	**$ 2,889,433**

The accompanying notes are an integral part of these statements.

Basis of Presentation

In accordance with NASA's Chief Financial Officer (CFO) directive that installations begin the process of fulfilling the requirements legislated by the Chief Financial Officers Act of 1990, regarding the preparation of subject to audit financial statements (beginning FY 1996), these statements were formulated from the books and records of GSFC in conformity with form and content procedures specified in OMB Bulletin 94-01.

Reporting Entity

GSFC is one of nine NASA Field Centers established to assist NASA in its mission to provide for aeronautical and space activities. The financial management of NASA's operations is the responsibility of Center officials at all organizational levels. Ultimately, the Regional Finance Office, Code 151, within the Office of the Center's Chief Financial Officer is responsible for synthesizing, aggregating, and reporting accounting events to NASA Headquarters Code B and the Department of Treasury (for cash transactions), in accordance with Agencywide financial management regulations. These statements refer only to the Goddard business.

The GSFC overall accounting system consists of numerous feeder systems. When combined, they provide the basic information necessary to meet internal and external financial reporting requirements in terms of funds control and accountability. Albeit, it is recognized that the current systems do not meet OMB Circular A-127 requirements for a single integrated financial system. NASA is moving to implementing a fully integrated financial system. NASA has selected SAP Public Sector and Education, Inc. to deliver a commercial off-the-shelf accounting system as part of the integrated financial program that will replace 10 different systems now used by NASA Field Centers. Currently, Goddard is scheduled for deployment in FY 2003.

The following five direct appropriations require individual treatment and are distinctly classified in GSFC combined accounting and control systems:

(1) Human Space Flight (HSF) — supports human space flight research and development activities for space flight, spacecraft control, and communications actions. This includes research, development, operations, services, maintenance, and construction of facilities, which encompass the repair, rehabilitation, and modification of real and personal property. Beginning in FY 2002, the HSF appropriation also includes budgetary resources for salaries, fringe benefits and related expenses, in addition to support for research operations that were previously funded under Mission Support (MS).

(2) Space, Aeronautics and Technology (SAT) — provides for the conduct and support of science, aeronautics, and technology programs. Research, development, operations, services, maintenance, and construction of facilities (repair, rehabilitation, and modification of real and personal property) also serve as by-products of this appropriation. Beginning in FY 2002, the SAT appropriation also includes budgetary resources for salaries, fringe benefits and related expenses, in addition to support for research operations that were previously funded under Mission Support (MS).

(3) Mission Support (MS) — funds safety, reliability and quality assurance activities in support of Agency programs and space communication services for NASA programs. The appropriation also provides budgetary resources for salaries, fringe benefits and related expenses, while supporting research and construction of facilities. Although still current, FY 2001 is the last year that GSFC will receive any new funding under this appropriation.

(4) Construction of Facilities (C of F) — provides budgetary resources for construction, repair, rehabilitation and modification of facilities, minor construction of new facilities and additions to existing structures, and facility planning and design. This appropriation was restructured and replaced in the FY 1995 NASA budget.

(5) Office of the Inspector General (OIG) — provides funds necessary for OIG salary, travel and related expenses required to conduct audits and investigations of Center activities.

(6) Trust Fund (TF) — provides for expenses of all property and services procured for the trust fund. This includes Science, Space and Technology Education Trust Fund and Gifts and Donations

In addition to the direct appropriations, we receive funds from various Federal and non-Federal customers to perform aeronautical and space activities.

Basis of Accounting

GSFC accounts are maintained on an accrual basis (i.e., expenses are recorded when incurred and revenue when earned). Expenses are classified in the accounts by appropriation in accordance with the Agencywide coding structure, which sets forth a uniform classification of financial activity that is used for planning, budgeting, accounting, and reporting. The expenses are further categorized in the General Ledger as operating or capitalized expenditures.

Advances

GSFC distributes the majority of its funding used for the University Contracts and Grants Program by the method of Letter of Credit through the Health and Human Services (HHS) Payment Management System (PMS). The HHS serves as an agent for the U.S. Treasury in processing the drawdown of funds (disbursements) from a pre-established balance set up by GSFC based on contract/grant awards. The established balance for each University constitutes advance payments. A smaller number of university contract/grant recipients receives advance payments on a quarterly basis via Electronic Funds Transfer (EFT) payments through the U.S. Treasury system. In accordance with OMB Circular A-110, quarterly financial reporting of transactions is provided by recipients on Federal Cash Transactions Reports (SF 272's). Detailed monitoring, funds control (against outstanding obligations), and accountability records are maintained. In addition, audits by the Defense Contract Audit Agency and NASA's OIG support this monitoring.

Property, Plant, and Equipment (PP&E)

GSFC-owned Property, Plant, and Equipment (PP&E) may be held by the Center or its contractors. Under the provisions of the Federal Acquisition Regulation (FAR), contractors are responsible for control over and accountability for such property in their possession. The GSFC General Ledger is capable of separately classifying Government-held PP&E from Contractor-held PP&E.

Government regulation does not make a provision for depreciating PP&E under appropriated funding authority. However, in accordance with the User Charge Act and OMB Circular A-25, NASA is permitted to assess depreciation charges for the use of facilities and equipment, under the "full cost" concept, to non-Government reimbursable customers. It should also be noted that depreciation of Agency assets is calculated and accounted for at the Agency level.

PP&E is capitalized when the unit acquisition cost is $100,000 or more; have an estimated useful life of 2 years or more; are not intended for sale in the ordinary course of operations; and have been acquired or constructed with the intention of being used, or being available for use, by the Agency. Capitalized cost includes unit cost, transportation, installation, and handling and storage cost.

Beginning in October 2000, SFFAS No 10 mandated NASA to categorize internal-use software as general PP&E. Thus, the cost of the software must be capitalized if the cost is $100,000 or greater and the useful life of the software is 2 years or more. The software costs that must be captured and analyzed include new software, such as internally developed, COTS, and contractor developed; and enhanced software; and software where the enhancement results in significant additional capability beyond which the software was originally intended. This standard resulted in various treatments for each type of software. If software costs do not meet these guidelines, then they are expensed as incurred. This includes costs to repair design flaws, minor upgrades, data conversion costs, maintenance costs, and training costs.

Land values are recorded at acquisition cost and cost of improvements. Buildings are also valued at acquisition cost, including the cost of capital improvements and fixed equipment required for functional use of the facility.

Government-owned/contractor-held property is in two distinct categories: real property and work in progress. Real property is land, buildings, structures and facilities, materials, plant equipment, Agency-peculiar property, special tooling, and special test equipment. Work in progress is construction in progress and contract work in progress property, which is real property in various stages of completion. Contractors are directed to report annually on NASA Form 1018 real property costing $100,000 or more and having a useful life of 2 years, as well as all materials and work in progress. These amounts are included in the Statement of Financial Position. Industrial Property Management Specialist (IPMS), Department of Defense (DOD) and the Deputy Chief Financial Officer (DCFO) review this reporting.

Liabilities for Reimbursable Advances

Under the Economy Act, OMB Circular A-34 and the Federal Acquisition Regulations (FAR), Federal agencies are granted the authority to require advance payment from other Federal agencies. NASA changed its procedures with advances effective October 1, 2001. Advance payment is now required for all Federal and non-Federal reimbursable agreements; except for those agreements exempted by the Chief of the Accounting, Reporting and Analysis Branch or the GSFC Deputy Chief Financial Officer. GSFC recognizes the advances as unearned revenue thereby recording them as a liability on the Statement of Financial Position.

Revenues and Other Financing Sources

GSFC receives the majority of its funding through multiyear appropriations. These include 3-year appropriations for construction activities, 2-year appropriations for operational and space flight activities, and a single year appropriation for civil service payroll and travel. In addition to appropriated funds, the Center performs services for Federal and non-Federal customers upon receipt of customers funding authority.

Notes to the Statement of Financial Position For the Year Ended September 30, 2002

NOTE 2 – FUND BALANCES WITH TREASURY *(In Thousands):*

	Obligated Available	Unobligated Available	Unobligated Restricted	Total
Appropriated Funds	$1,401,177	$229,049	$15,510	$1,645,736
Trust Fund	0	50	0	50
Reimbursable Advances	113,374	0	0	113,374
Total Funds Balance with Treasury	**$1,514,551**	**$229,099**	**$15,510**	**$1,759,160**

GSFC cash receipts and disbursements are processed by the U.S. Treasury. The funds with the U.S. Treasury include appropriated funds, trust funds, and deposited funds for advances received for reimbursable services.

The substantial increase in FY 02 is due to an increase in appropriations received, an increase in reimburseable advances, and a decrease in disbursements

Non-federal customers provide advance payments which are placed on deposit with the U.S. Treasury until services are performed. Beginning in FY 02, federal customers are mandated to provide advance payments for reimbursable work.

NOTE 3 – ACCOUNTS RECEIVABLE NET *(In Thousands):*

	Entity Accounts Receivable	Allowances for Losses on A/R & Interest	Net Amount Due
Intragovernmental	$ 9,613		$ 9,613
Governmental	2,543	$ (16)	2,527
Total Accounts Receivable	**$ 12,156**	**$ (16)**	**$12,140**

Accounts receivable consist of amounts owed to GSFC by other Federal agencies and amounts owed by the public. NASA establishes an allowance amount for reporting purposes based on an analysis of outstanding receivable balances.

NOTE 4 – ADVANCES AND PREPAYMENTS *(In Thousands):*

	2002	2001	CHANGE
Intragovernmental	$ 16,898	$ 18,119	$ (1,221)

The increase in intragovermental advances represents a Governmentwide partner reconciliation requirement issued by the Office of Management and Budget.

NOTE 5 – OPERATING MATERIALS AND SUPPLIES *(In Thousands):*

	2002	2001	CHANGE
Contractor-held Materials	$170,134	$163,946	$ 6,188
Stores Stock	4,773	5,511	$ (738)
Total Operating Materials and Supplies	**$174,907**	**$169,457**	**$ 5,450**

NOTE 6 – PROPERTY, PLANT, AND EQUIPMENT *(In Thousands):*

	2002	2001	Change
Government-owned/Government-held			
Land	$ 4,964	$ 4,964	$ 0
Structures, Facilities & Leasehold Improvements	505,363	501,602	3,761
Equipment	214,486	204,531	9,955
Work-in-Process	37,496	47,473	(9,977)
Total	**$ 762,309**	**$ 758,570**	**$ 3,739**

	2002	2001	Change
Government-owned/Contractor-held			
Structures, Facilities & Leasehold Improvements	$ 7,870	$ 7,865	$ 5
Equipment	139,137	66,744	72,393
Special Tooling	7,119	8,151	(1,032)
Special Test Equipment	46,905	81,145	(34,240)
Agency-peculiar Property	81,244	121,383	(40,139)
Work-In-Process	667,594	898,199	(230,605)
Total	**$ 949,869**	**$1,183,487**	**$ (233,618)**
Grand Total	**$1,712,178**	**$1,942,057**	**$ (229,879)**

Decrease in PP&E from FY 01 to FY 02 is due to the write-off of property previously reported to Goddard by several contractors on NASA Form 1018, but the property was actually owned by another agency.

NOTE 7 – OTHER LIABILITIES *(In Thousands):*

	Current	Non-Current	Total
Liabilities Covered by Budgetary Resources:			
Intragovernmental Liabilities:			
Liabilities for Reimbursable Advances	$113,374	$ 0	$ 113,374
Total	**$113,374**	**$ 0**	**$ 113,374**
Governmental Liabilities:			
Liabilities for Deposit and Suspense Funds	$ (9,641)	$ 0	$ (9,641)
Accrued Funded Payroll	20,580	0	20,580
Total	**$ 10,939**	**$ 0**	**$10,939**
Total Liabilities Covered by Budgetary Resources	**$124,313**	**$ 0**	**$ 124,313**

	Current	Non-Current	Total
Liabilities Not Covered by Budgetary Resources:			
Intragovernmental Liabilities			
Accounts Payable for Closed Appropriations	$ 0	$ 669	$ 669
Total	**$ 0**	**$ 669**	**$ 669**
Governmental Liabilities:			
Accounts Payable for Closed Appropriation	$ 0	$11,719	$ 11,719
Liabilities for Receipt Accounts	1	0	1
Unfunded Annual Leave	25,857	0	25,857
Total	**$ 25,858**	**$11,719**	**$ 37,577**
Total Liabilities Not Covered by Budgetary Resources	**$ 25,858**	**$12,388**	**$ 38,246**
Grand Total	**$150,171**	**$12,388**	**$ 162,559**

Accounts payable include amounts recorded for receipt of goods or services furnished to the Center but not disbursed. Additionally, throughout GSFC, cost is recognized and accrued based on information provided monthly by contractors on cost and performance reports (NASA Form 533, Contractor Financial Management Report). The Defense Contract Audit Agency (DCAA) performs independent audits on reported cost to ensure reliability of estimates. Also further assurance is provided by GSFC resource analysts as a result of examining cost accruals generated from the NF 533s.

Please see Note 1 for further discussion on the liability for reimbursable advances.

NOTE 8 – NET POSITION *(In Thousands):*

	Appropriated Funds
Unexpended Appropriations	
Undelivered	$888,474
Unobligated:	
Available	229,049
Unavailable	15,510
Trust Fund Balance	50
Invested Capital (Note 11)	1,887,085
Cumulative Results of Operations	12
Future Funding Requirements	(38,246)
Total Net Position	**$2,981,934**

Increase in unexpended appropriations is due to an increase in appropriations received and a decrease in disbursements.

Future funding requirements represents liabilities not funded by past appropriations and for which no funding has been authorized. This is GSFC's future liability.

NOTE 10 – INVESTED CAPITAL *(In Thousands):*

Property, Plant and Equipment	$1,712,178
Operating Materials and Supplies	174,907
Invested Capital	**$1,887,085**

Decrease in PP&E from FY 01 to FY 02 is due to the write-off of property previously reported to Goddard by several contractors on NASA Form 1018, but the property was actually owned by another agency.

NASA technicians remove Germanium black Kapton film after testing in one of Goddard's many vacuum chambers.

Goddard's Values

Agility

Anticipating the future, leading change, and adapting quickly are crucial to thriving in a dynamic environment.

Balance

An employee's work life and personal life, including health, family, community involvement, and other interests, contribute to the vitality both of the individual and of the Center.

Creativity

Freedom to explore new ideas stimulates discovery, fosters innovation and leads to more effective ways of doing work.

Dedication

Successful results require a commitment to excellence and to individual and team responsibilities.

Integrity

Trust, fairness, honesty and accountability for our actions are the cornerstones of personal and organizational integrity.

Respect

Diversity among people and their ideas is an inherent strength as we work toward fulfilling Goddard's mission.

Teamwork

Accomplishments result from successful teams, both internal and external to the Center, that capitalize on the strengths and contributions of every team member.

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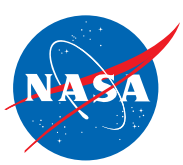

National Aeronautics and
Space Administration

Goddard Space Flight Center