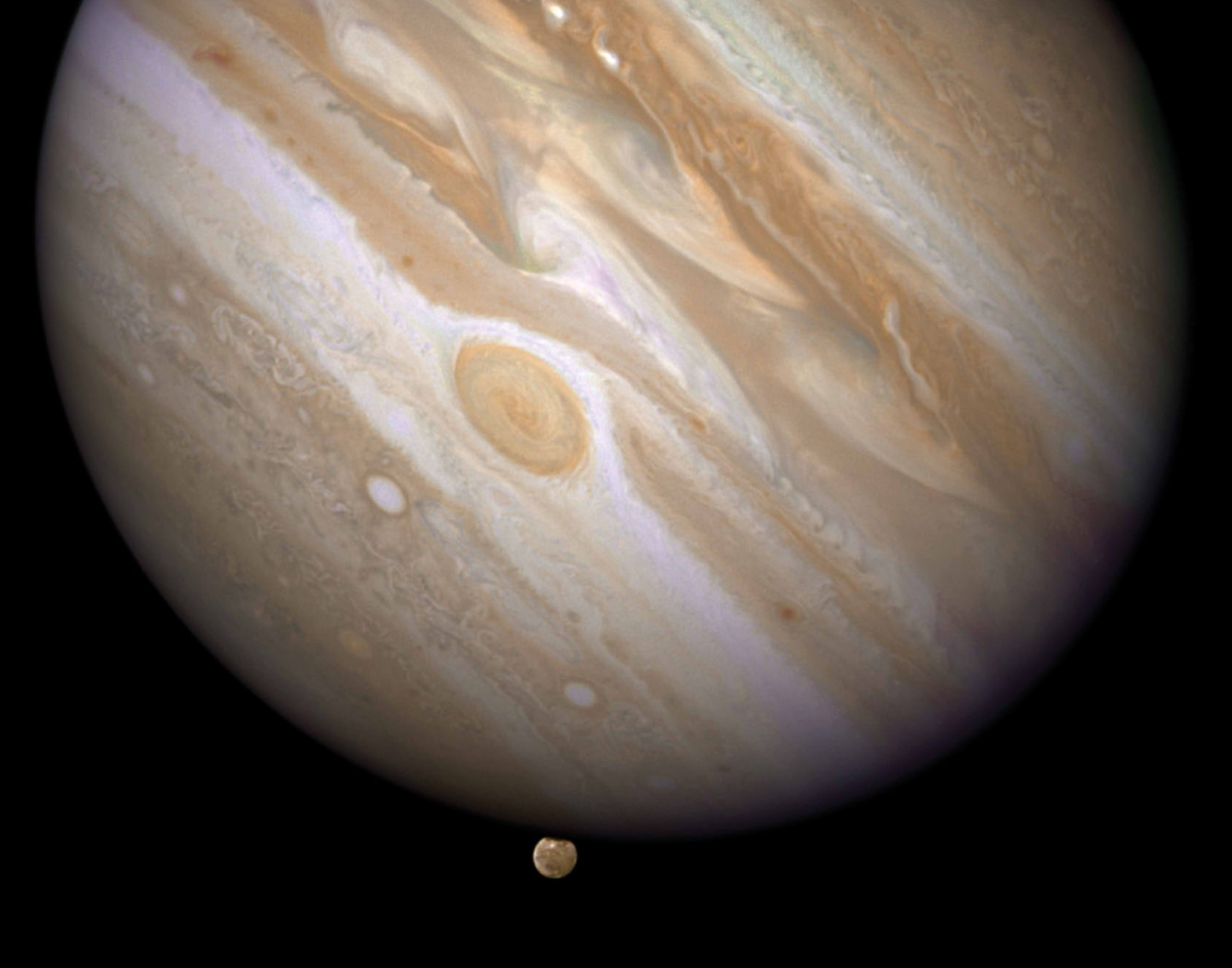
NASA Science 2010

National Aeronautics and
Space Administration



JANUARY **2010**

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 New Year's Day	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18 Martin Luther King, Jr. Day	19	20	21	22	23
24 / 31	25	26	27	28	29	30

Hubble Catches Jupiter's Largest Moon Going to the 'Dark Side'

Composed of rock and ice, Ganymede is Jupiter's largest moon, and the largest in our Solar System—it is larger than the planet Mercury. But in the shadow of a massive gas giant, it looks more like a dirty snowball, dwarfed in size by our Solar System's largest planet. In fact, Jupiter is so big that only part of its Southern Hemisphere can be seen in the image above.

NASA's Hubble Space Telescope caught Ganymede just before it ducked behind the giant planet. Taken on April 9, 2007, this image is a composite of separate exposures made by the Wide Field Planetary Camera 2 (WFPC2) instrument. Three filters were used to sample various wavelength ranges. The color results from assigning different hues (colors) to each monochromatic image. The image shows Jupiter and Ganymede in close to natural colors. The image also shows Jupiter's Great Red Spot, the large eye-shaped feature at upper left. A storm the size of two Earths, the Great Red Spot has been raging for more than 300 years. Hubble also gives us a close-up view revealing the texture of the clouds in the Jovian atmosphere as well as various other storms and vortices.

Astronomers use images like this one to study Jupiter's upper atmosphere. As Ganymede passes behind the giant planet, it reflects sunlight, which then passes through Jupiter's atmosphere. Imprinted on that light is information about the gas giant's atmosphere, which yields clues about the properties of Jupiter's high-altitude haze above the cloud tops.

Image and Partial Text Credit: NASA/ESA/University of Arizona.

A first grade participant in the Flat Stanley project mailed a "flat" doll of herself to Langley Research Center to learn about NASA. Her doll made stops at several planets as she was guided through a virtual tour of our solar system. Credit: NASA.

DECEMBER **2009**

S	M	T	W	T	F	S
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20	21	22	23	24	25	26
27	28	29	30	31		

FEBRUARY **2010**

S	M	T	W	T	F	S
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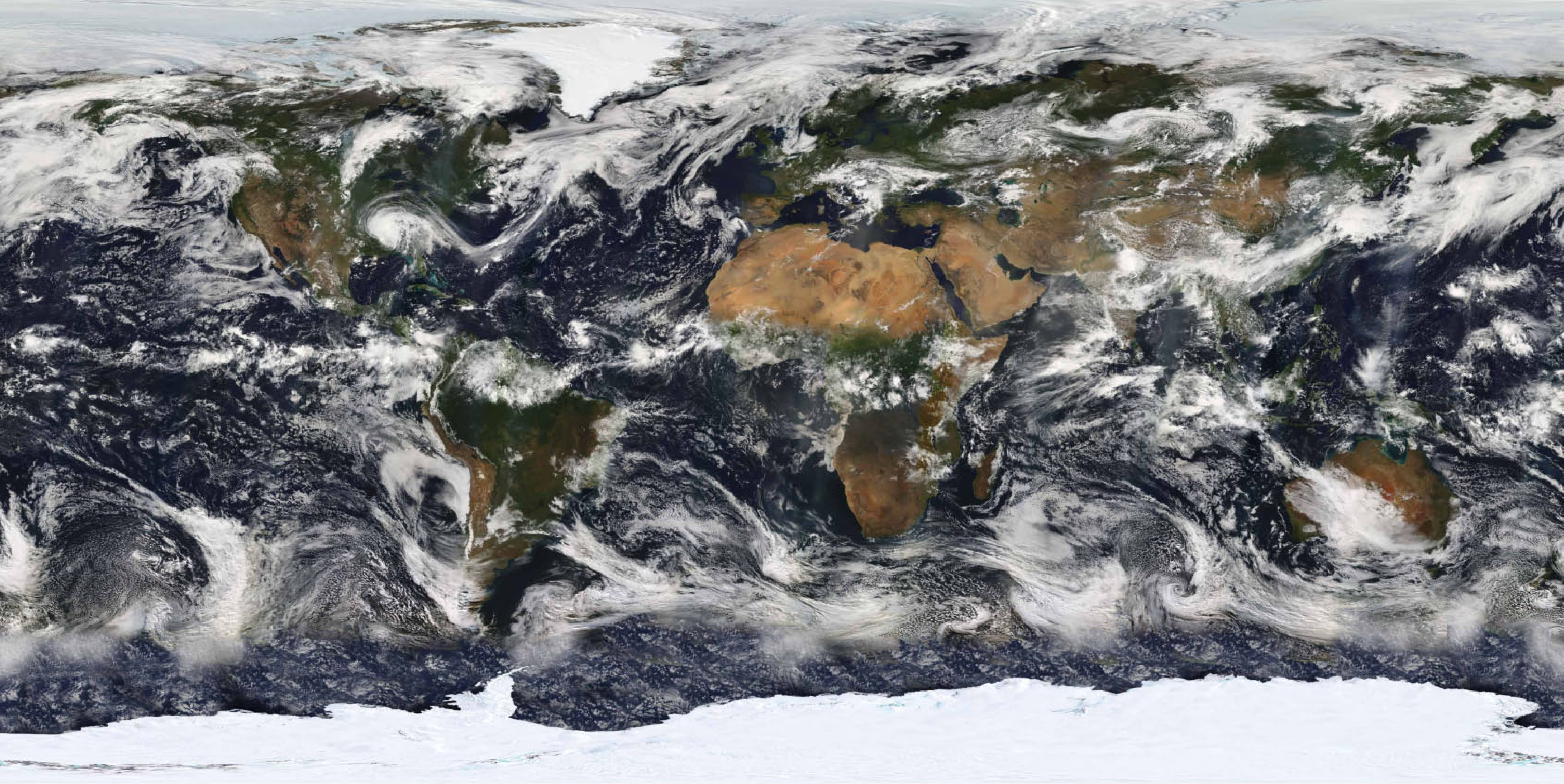
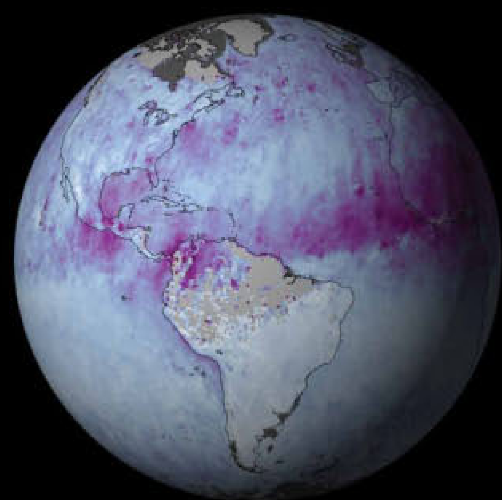
21	22	23	24	25	26	27
28						



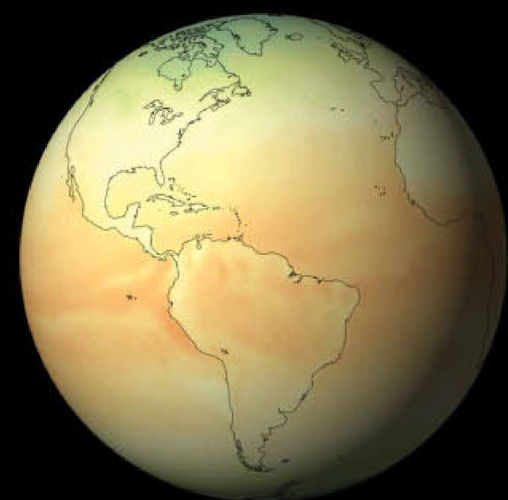
MODIS
Biosphere

MOPITT
Carbon Monoxide



MISR
Aerosols

ASTER
Elevation



CERES
Net Radiation

FEBRUARY **2010**

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15 Washington's Birthday	16	17	18	19	20
21	22	23	24	25	26	27
28						

Terra Turns Ten

In February 2000, NASA's Terra satellite made its first observations, ushering in a decade of observations from NASA's Earth Observing System, a coordinated series of satellites that monitor how Earth is changing and what the consequences might be. These images illustrate some of the Earth systems that Terra tracks. The top image, largely from Terra's Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on July 11, 2005, represents the most detailed, daily photo-like view of Earth's land, oceans, and atmosphere available.

The small globes show sample measurements from Terra's five instruments. On the left, MODIS monitors growing plants. Dark green on land (June 2009) and light colors in the ocean (March 2009) represent the greatest abundance of photosynthesis. In all five globes, gray indicates no data. Measurements of Pollution in The Troposphere (MOPITT) records carbon monoxide (June 2009), a gas released by burning plants and fossil fuels. The highest concentrations of carbon monoxide are dark orange. Center, Multi-angle Imaging SpectroRadiometer (MISR) tracks aerosols—atmospheric particles like pollution or dust—between March and May 2007. High concentrations (Saharan dust over the Atlantic, smoke and pollution over America) are in purple. Next, Stereo imagers from Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) provide the most extensive satellite-based topographic model of Earth to date. The far right globe shows net radiation, the balance between energy entering and leaving Earth, from Clouds and the Earth's Radiant Energy System (CERES) in March 2009. Orange shows where more energy is entering, while green represents more energy leaving. If the energy entering does not match the energy leaving over time, Earth's climate will change until a new balance is achieved.

Image Credit: NASA/GSFC/ASTER/CERES/MISR/MODIS/MOPITT.

MODIS
Biosphere

MOPITT
Carbon Monoxide

MISR
Aerosols

ASTER
Elevation

CERES
Net Radiation

Students interact with NASA's Dynamic Planet digital video globe exhibit at the Smithsonian's Museum of Natural History. Credit: NASA.

JANUARY **2010**

S	M	T	W	T	F	S
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3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

MARCH **2010**

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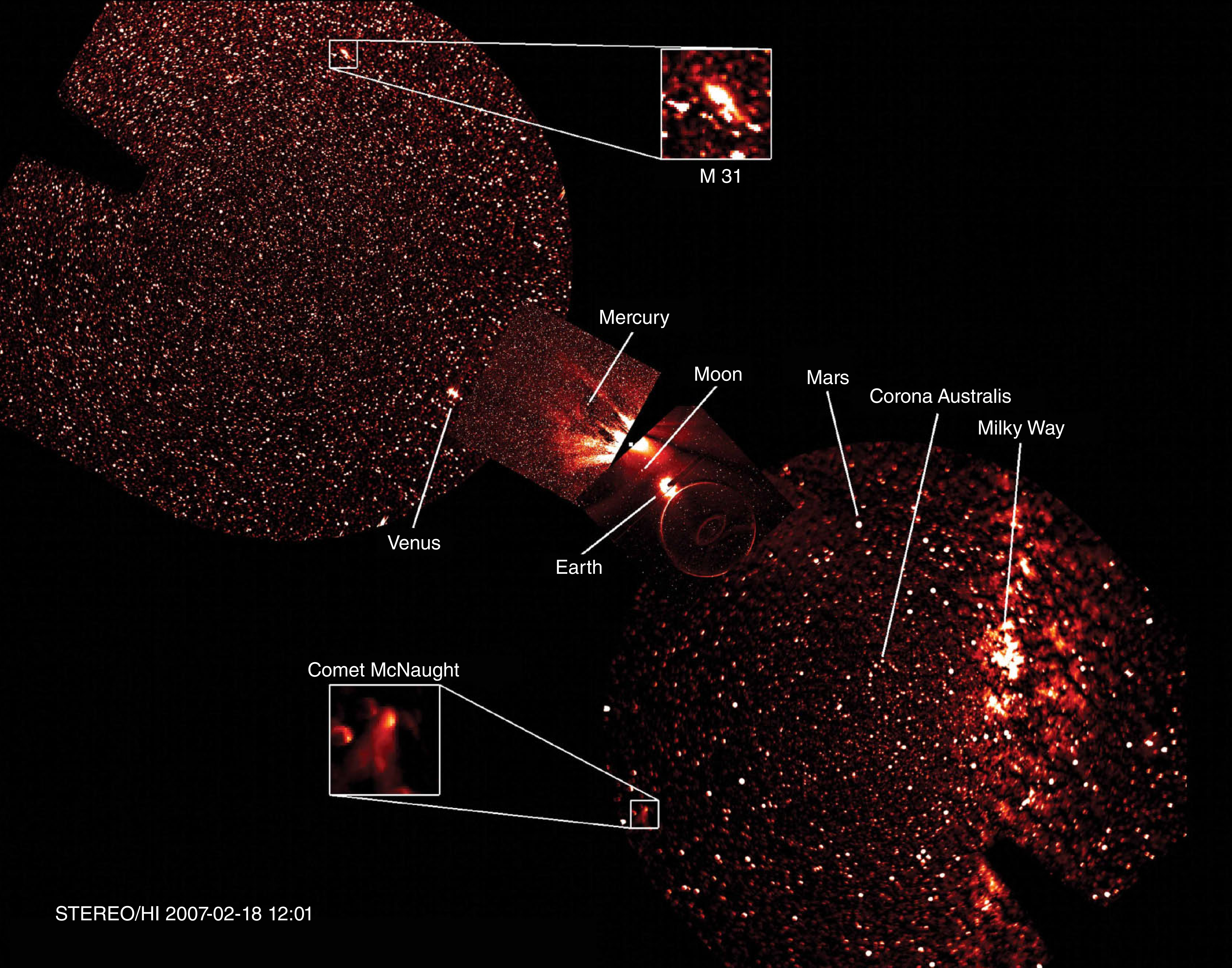
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			



M 31
Mercury
Moon
Mars
Corona Australis
Milky Way
Venus
Earth
Comet McNaught
STEREO/HI 2007-02-18 12:01

MARCH 2010

New Moon · First Quarter · Full Moon · Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10	11	12	13
14 Daylight Saving Time Begins	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

STEREO Tracks Solar Storms Through Space

Launched in late 2006, NASA's twin Solar TErrestrial RElations Observatory (STEREO) spacecraft carry a variety of instruments to investigate the Sun and the material it ejects into the solar system. Perhaps the most novel instruments are the wide and ultra-wide field-of-view heliospheric imagers (HIs), with fields of view extending up to 17° and 57° away from the Sun. In this composite of HI images taken when the STEREO spacecraft were less than one degree apart in early 2007, we can see not only the Moon, the planets Mercury, Venus, and Mars, as well as Earth, and a coronal mass ejection (in the same frame as Mercury), but also deep-sky objects, as well. The Andromeda galaxy, M31, is visible at top left (and magnified in the upper inset), and the Milky Way is obvious in the lower right. Also visible at bottom center (and inset) is the bright Comet McNaught, named for the Australian astronomer who first observed it in 2006.

The twin spacecraft will increase their separation from Earth some 22° each year. They should be well posed to capture the expected increase in solar activity over the next few years. For more information on STEREO, go to *stereo.gsfc.nasa.gov/* where you can see current images and movies from the imaging instruments onboard.

Image Credit: NASA.

Visitors safely gaze at the sun through a solar telescope during an open house event at the Glenn Research Center. Credit: NASA.

FEBRUARY 2010

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

APRIL 2010

S	M	T	W	T	F	S
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

NASA

APRIL **2010**

New Moon · First Quarter · Full Moon · Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Butterfly Emerges from Stellar Demise in Planetary Nebula NGC 6302

This celestial object looks like a delicate butterfly. But it is far from serene. What resembles dainty butterfly wings are actually roiling cauldrons of gas heated to more than 36,000°F. The gas is tearing across space at more than 600,000 mph—just for comparison, that's fast enough to travel from Earth to the Moon in 24 minutes! A dying star that was once about five times the mass of the Sun is at the center of this fury. It has ejected its envelope of gases and is now unleashing a stream of ultraviolet radiation that is making the cast-off material glow.

This dramatically detailed close-up of the dying star's nebula was recorded by the newly upgraded Hubble Space Telescope (HST), which will celebrate the 20th anniversary of its launch on April 24. NGC 6302 was imaged on July 27, 2009, with Hubble's Wide Field Camera 3 in ultraviolet and visible light. Hubble's suite of new instruments allows it to study the universe across a wide swath of the light spectrum, from ultraviolet all the way to near-infrared. In addition, scientists released spectroscopic observations that slice across billions of light-years to probe the cosmic-web structure of the universe and map the distribution of elements that are fundamental to life as we know it.

The central star itself cannot be seen, because it is hidden within a doughnut-shaped ring of dust, which appears as a dark band pinching the nebula in the center. The thick dust belt constricts the star's outflow, creating the classic "bipolar" or hourglass shape displayed by some planetary nebulae.

Image and Partial Text Credit: NASA, ESA, and the Hubble SM4 ERO Team.

Students participate in a Digital Learning Network broadcast featuring HST's newest image releases following the STS-125 servicing mission. Credit: NASA.

MARCH 2010

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

MAY 2010

S	M	T	W	T	F	S
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2	3	4	5	6	7	8
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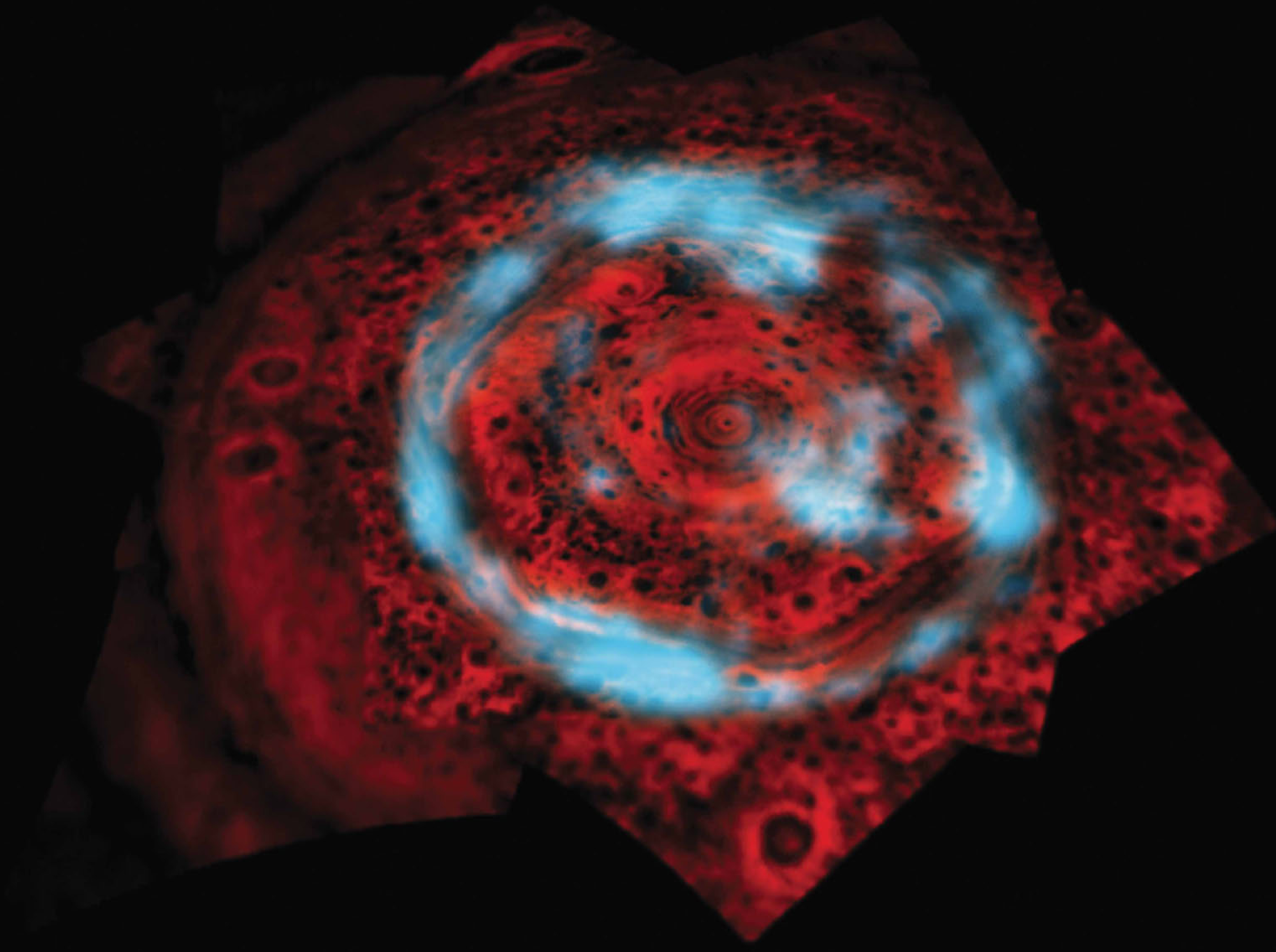
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

NASA



MAY 2010

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3	4	5	6	7	8
9 Mother's Day	10	11	12	13	14	15
16	17	18	19	20	21	22
23 / 30	24 / 31 Memorial Day	25	26	27	28	29

Saturn's Polar Aurora

Energetic particles crashing into Saturn's upper atmosphere cause an aurora around the polar regions—a phenomena not unlike what happens in Earth's atmosphere. Unlike Earth, we can't see Saturn's aurora with the naked eye, but NASA's Cassini spacecraft is equipped with instruments that help scientists peer into the infrared region of the electromagnetic spectrum (at 4 µm, or six times the wavelength we can see with human eyes) and when they do, the particles in Saturn's atmosphere "glow" brightly.

This image of the northern polar region of Saturn comes from the visual and infrared mapping spectrometer on NASA's Cassini spacecraft. It shows both the aurora and underlying atmosphere, each seen at two different wavelengths of infrared light. The image shows both a bright ring, as seen from Earth, as well as an example of bright auroral emission within the polar cap that had been undetected until the advent of Cassini. This aurora, which defies past predictions of what was expected, has been observed to grow even brighter than is shown here. Silhouetted by the glow (cast here to the color red) of the hot interior of Saturn (clearly seen at a wavelength of 5 µm, or seven times the wavelength visible to the human eye) are the clouds and haze that underlie this auroral region.

The aurora image was taken in the near-infrared on November 10, 2006, from a distance of 659,000 mi (1,061,000 km). The image of the clouds was obtained by Cassini on June 15, 2008, from a distance of 374,000 mi (602,000 km).

Image and Partial Text Credit: NASA/JPL/University of Arizona.

Students visit the NASA Science Mission Directorate booth at the American Geophysical Union fall meeting. Credit: NASA.

APRIL 2010

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

JUNE 2010

S	M	T	W	T	F	S
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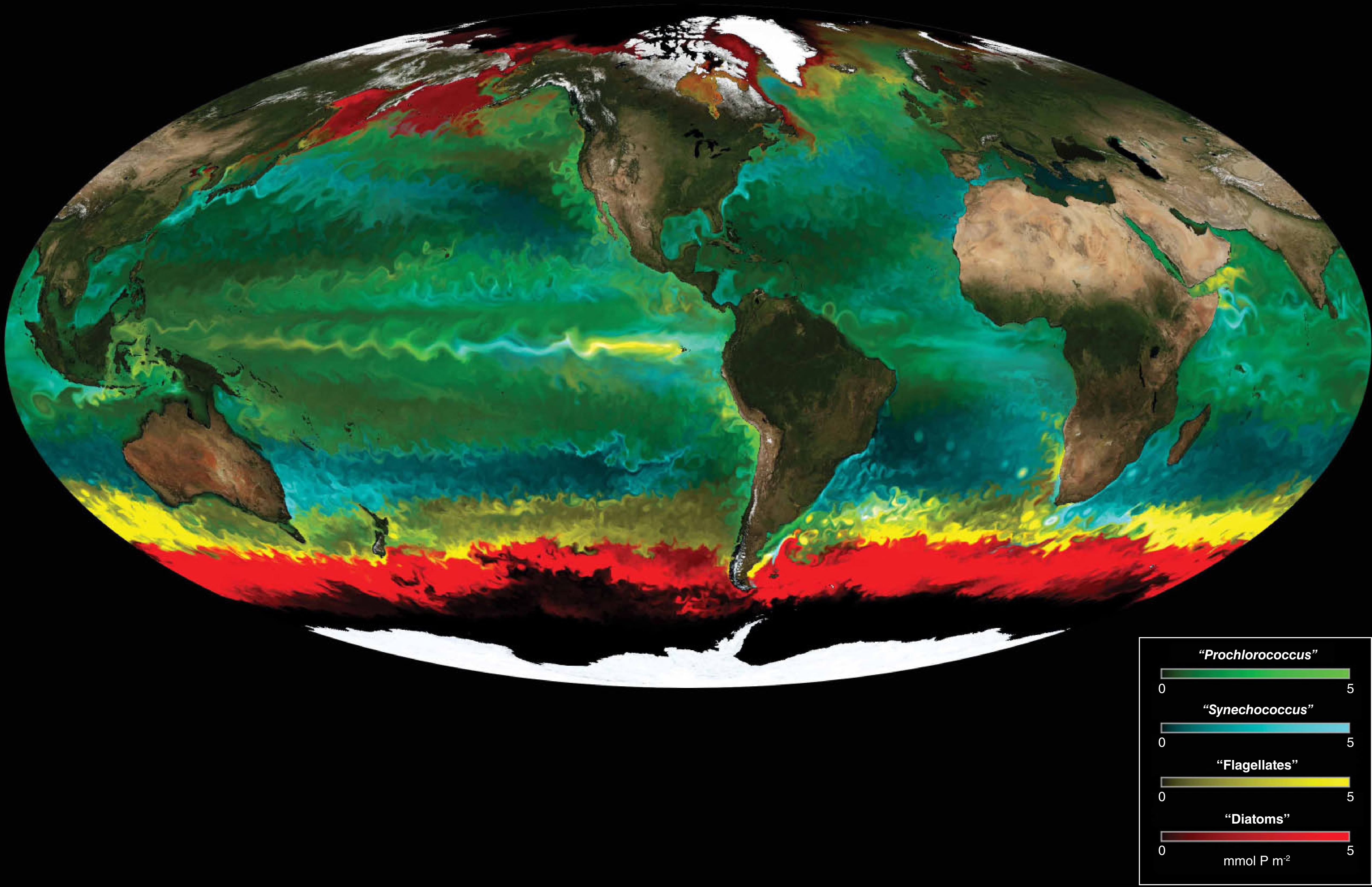
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			


"Prochlorococcus"
0
5
"Synechococcus"
0
5
"Flagellates"
0
5
"Diatoms"
0
5
mmol P m-2

JUNE 2010

New Moon | First Quarter | Full Moon | Last Quarter

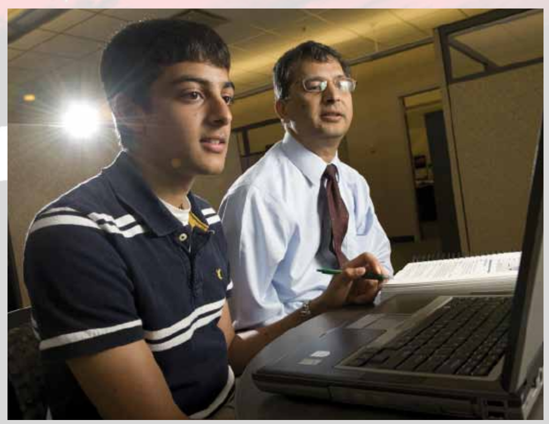
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1	2	3	4	5
6	7	8	9	10	11	12
13	14 Flag Day	15	16	17	18	19
20 Father's Day	21	22	23	24	25	26
27	28	29	30			

What's for Dinner?

This image shows the distribution of major groups of phytoplankton (see color bars for group names) in a computer model of the ocean. Phytoplankton are microscopic marine plants that hold the important role of sustaining the ocean's food chain. Upwelling of nutrient-rich waters from below and sunlight from above fuel the growth of phytoplankton in the surface ocean. Like terrestrial plants, phytoplankton contain the pigment chlorophyll and use photosythesis to convert water and carbon dioxide into organic matter, some of which sinks into the deep ocean, removing carbon from the surface ocean and the atmosphere.

This global model simulates 78 species of virtual phytoplankton which can be categorized into four broad functional groups mapped by the color shading in this October snapshot. The distribution of chlorophyll is measured from space by the Sea-viewing Wide Field-of-View Sensor (SeaWiFS) on the Orbview satellite and the Moderate Resolution Imaging Spectroradiometer (MODIS) on the Terra satellite using observations of the color of the surface ocean. Together, remote observations and models help scientists evaluate how ocean ecosystems regulate the global carbon cycle and how they respond to changing climate. Remote ocean color observations from SeaWiFS and MODIS reveal the patterns and rates of phytoplankton activity. Computer models such as this provide a means to connect these biological observations to the air-sea flux of carbon dioxide.

Image Credit: NASA/JPL/MIT.



A summer intern in the Interdisciplinary National Science Project Incorporating Research and Education Experience (INSPIRE) and his mentor ponder computer modeling data at Marshall Space Flight Center. Credit: NASA.

MAY 2010

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JULY 2010

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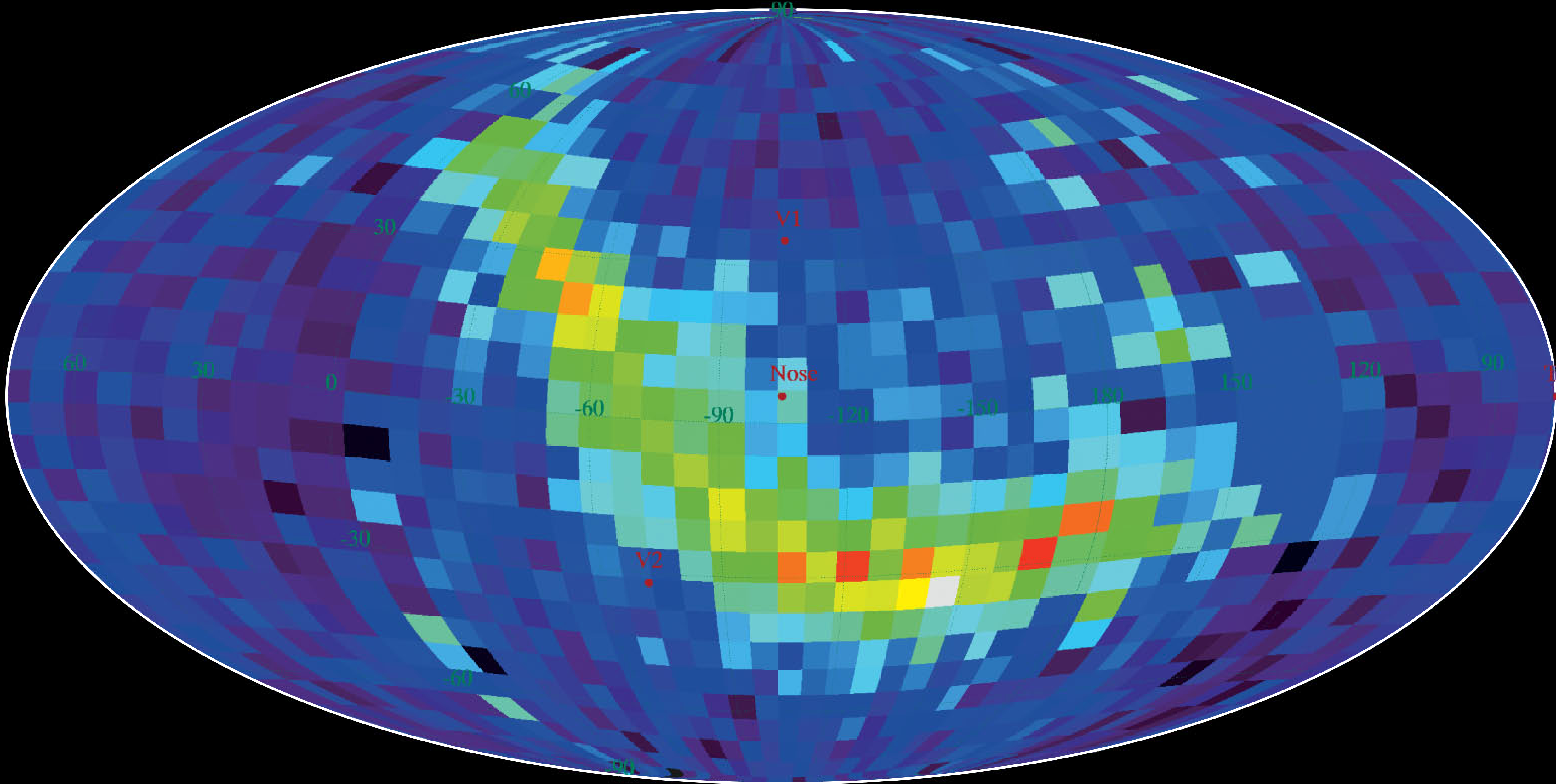
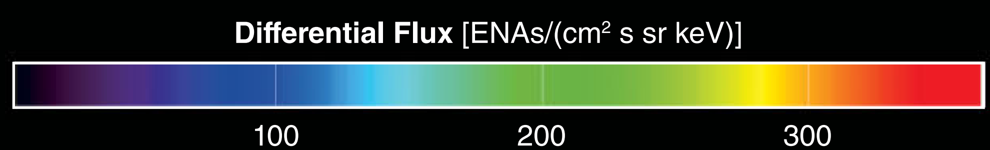
25	26	27	28	29	30	31

IBEX-Hi (0.9-1.5 keV)

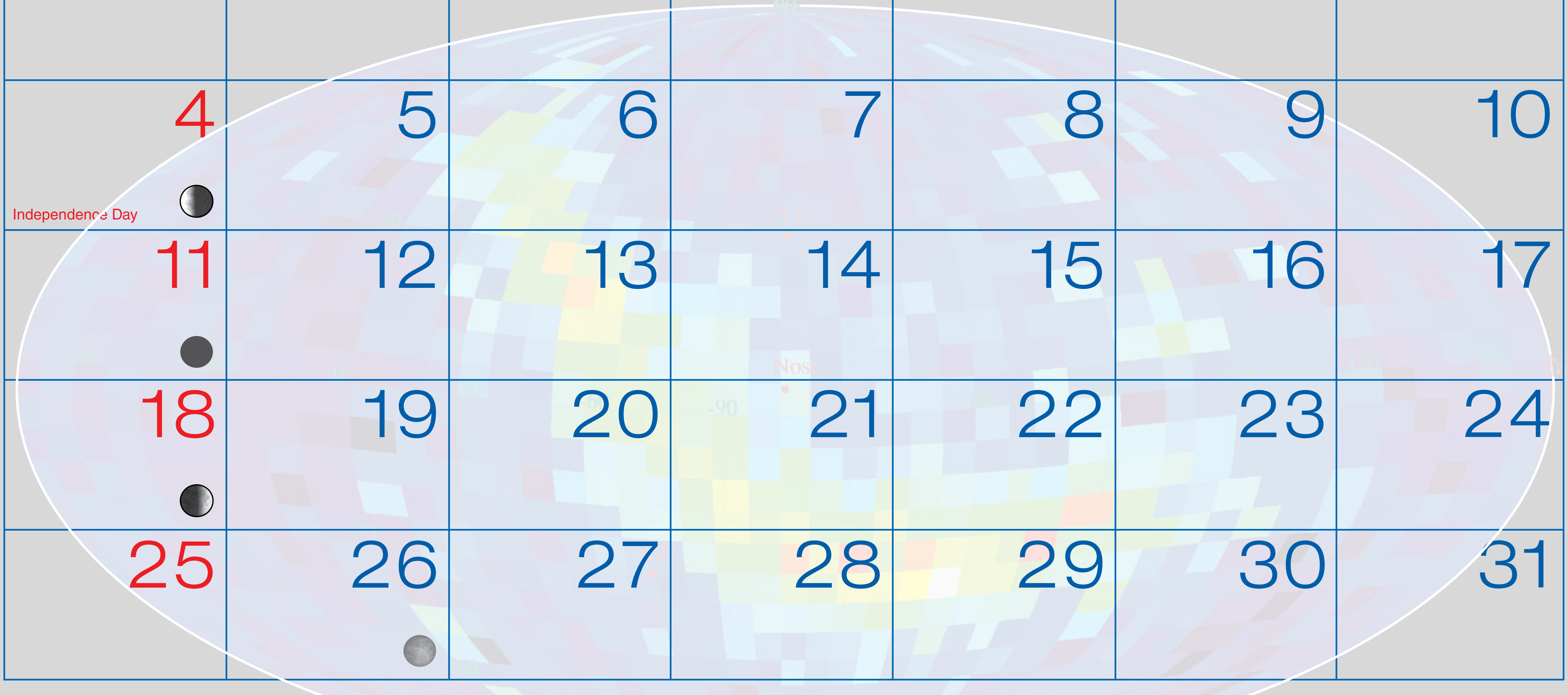




JULY 2010

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2	3
4 Independence Day	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

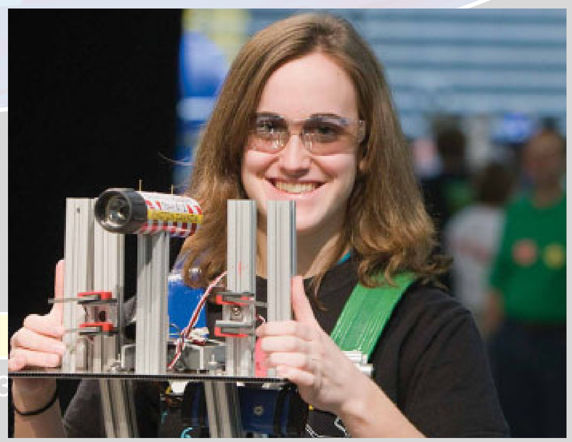


IBEX Probes the Outer Limits of Our Solar System

This map of energetic neutral atom flux measured by the IBEX Hi-energy sensor (IBEX-Hi) unveils the previously unknown global interactions between the local interstellar medium and the solar wind. These interactions create the boundaries that surround our solar system and shield it from the majority of the dangerous galactic radiation in the local interstellar medium. The map is shown in a Mollweide projection with the “Nose” (near the center) being the direction upwind of the interstellar flow and the “Tail” downwind of the local interstellar flow. The locations of the Voyager 1 (V1) and Voyager 2 (V2) satellites, which are directly measuring the local properties of solar wind beyond the termination shock at their individual locations are also shown. The IBEX measurements give the first global pictures of the remarkable interactions that occur at the edge of our solar system.

The Interstellar Boundary Explorer (IBEX) satellite orbits Earth and maps the boundary of our Solar System from Earth’s point of view. IBEX has completed the first ever all-sky maps of the boundary of our Solar System to help us better understand our home in space.

Image Credit: NASA.



A contestant in the For Inspiration and Recognition of Science and Technology (FIRST) Robotics Competition shows off her team’s robot. Credit: NASA.

JUNE 2010

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6	7	8	9	10	11	12
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27	28	29	30			

AUGUST 2010

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

AUGUST 2010

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Where Galaxies Collide…

The laws of physics dictate what happens when two or more bodies collide—ranging from the tiniest particles to the most massive "objects" in the Universe. With the aid of the Chandra X-ray Observatory and Hubble Space Telescope we can "see" the "impact" of a collision between galaxies. Data from the two observatories have been combined to create an image of an area of space—called the massive galaxy cluster MACSJ0717.5+3745 (MACSJ0717)—where four galaxies have been repeatedly colliding. MACSJ0717 is located 5.4 billion light years from Earth and is one of the most complex *galaxy clusters* ever observed.

The repeated collisions in MACSJ0717 are caused by a 13-million-light-year-long stream of galaxies, gas, and dark matter—known as a *filament*—pouring into a region already full of matter. A collision between gases in two or more clusters causes the hot gas to slow down. However, the galaxies, which are mainly empty space, do not slow down as much and so they move ahead of the gas. Therefore, the speed and direction of each cluster's motion—perpendicular to the line of sight—can be estimated by studying the offset between the average position of the galaxies and the peak in the hot gas.

The hot gas is color-coded to show temperature, similar to a temperature map of the Earth given in a weather forecast. In the image above, the coolest gas is shown as reddish purple, the hottest gas is blue and the temperatures in between are purple.

Image Credit: X-ray (NASA/CXC/IfA/C. Ma et al.); Optical (NASA/STScI/IfA/C. Ma et al.).

San Francisco Bay Area girls enjoy an interactive day of exploring science, technology, engineering, and mathematics during the Sally Ride Science Festival at Ames Research Center. Credit: NASA.

JULY 2010

S	M	T	W	T	F	S
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18	19	20	21	22	23	24
25	26	27	28	29	30	31

SEPTEMBER 2010

S	M	T	W	T	F	S
			1	2	3	4
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12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

SEPTEMBER **2010**

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4
5	6 Labor Day	7	8	9	10	11
12	13	14	15	16	17 Constitution Day	18
19	20	21	22	23	24	25
26	27	28	29	30		

Giant Ferns on Mars?

Of course not… but viewed from above, the dark branched features in the floor of Antoniadi Crater do sort of resemble giant ferns, or fern casts. However, these "ferns" would be several miles in size and are composed of rough rocky materials. This image came from the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter, and was taken on March 22, 2009.

The fern-like features are most likely a channel network that now stands in inverted relief. The channels may have been lined or filled by indurated materials, making the channel fill more resistant to erosion by the wind than surrounding materials. After probably billions of years of wind erosion the resistant channels are now relatively high-standing. The material between the branched ridges has a fracture pattern and color similar to deposits elsewhere on Mars that are known to be rich in hydrated minerals such as clays.

The inverted channels have short, stubby branches characteristic of formation by groundwater sapping. Spring water seeps into the channels and undercuts overlying layers, which collapse, so the channels grow headward. These images tell the story of an ancient wet environment on Mars, where life could have been possible. Ancient Martian life, if it existed, would most likely consist of microorganisms rather than giant tree ferns.

Image and Partial Text Credit: NASA/JPL.

A sixth-grader from Sunflower Elementary School in Kansas signs the next rover to Mars in a Jet Propulsion Laboratory clean room. The young student wrote the winning essay in which she named the rover "Curiosity." Credit: NASA.

AUGUST **2010**

S	M	T	W	T	F	S
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22	23	24	25	26	27	28
29	30	31				

OCTOBER **2010**

S	M	T	W	T	F	S
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

OCTOBER **2010**

New Moon | First Quarter | Full Moon | Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6	7	8	9
10	11 Columbus Day	12	13	14	15	16
17	18	19	20	21	22	23
24 / 31 Halloween	25	26	27	28	29	30

UAVSAR: Working to Detect Earthquakes Before they Happen

Changes in the movement of the Earth's crust give scientists information on the pressures building up at depth and may be capable of identifying regions that have a high probability for near-future earthquakes. The Unmanned Aerial Vehicle Synthetic Aperture Radar (UAVSAR) is a tool that scientists use to help them with these kinds of studies, and also serves as an airborne testbed to evaluate future space-based synthetic aperture radars, such as the one planned for an upcoming NASA Earth satellite mission called Deformation, Ecosystem Structure and Dynamics of Ice (DESDynI).

This image comes from UAVSAR and shows the San Andreas Fault west of San Mateo, CA. The fault runs from the top left of the image to the bottom right corner, partly beneath the Crystal Springs Reservoir shown in black. The black line curving along the east side of the fault is Interstate 280 and California Highway 91 runs from the top right across to the center left of the image, heading towards Half Moon Bay to the west. San Mateo and Burlingame are parts of the large urbanized area in various tones of pink and green, and Foster City is the area of curved streets extending out into the San Francisco Bay at the top right. Features in the image are presented using a false-color composite of three microwave frequency channels (20-cm wavelength) from UAVSAR aboard a *Gulfstream III* aircraft. (The SAR system is being designed for use on a UAV, but is initially being tested on the Gulfstream III.) Using a technique called *interferometry*, the data will be combined with later observations to measure how land along the fault has moved over time. The image is about 10 mi (15 km) across and north is to the top.

Image and Partial Text Credit: NASA/JPL.

Visitors try out an interactive activity at the Engineering and Aviation Science booth at Maryland's Place in Space Showcase. Credit: NASA.

SEPTEMBER **2010**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

NOVEMBER **2010**

S	M	T	W	T	F	S
	1	2	3	4	5	6
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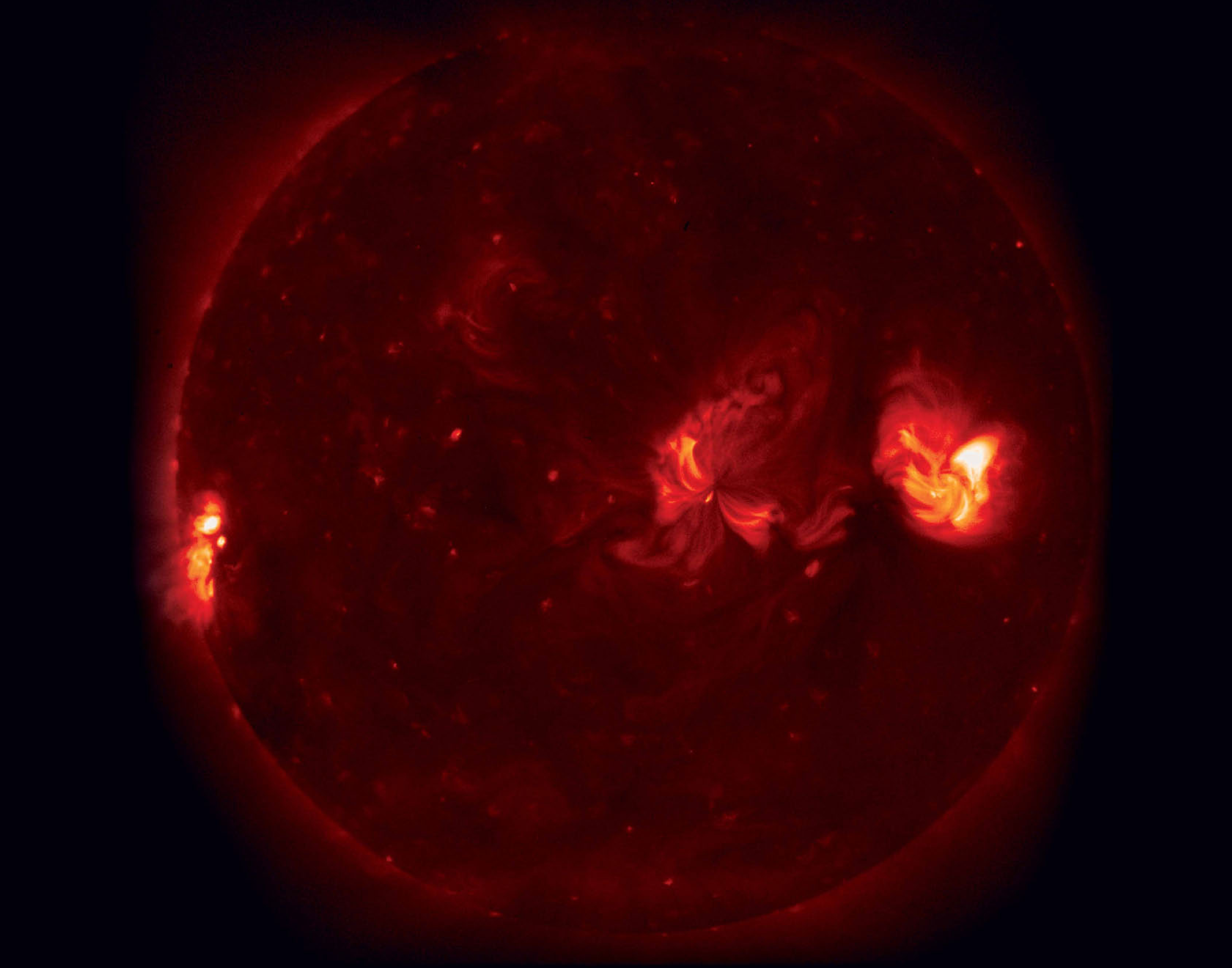
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				



NOVEMBER 2010

New Moon | First Quarter | Full Moon | Last Quarter

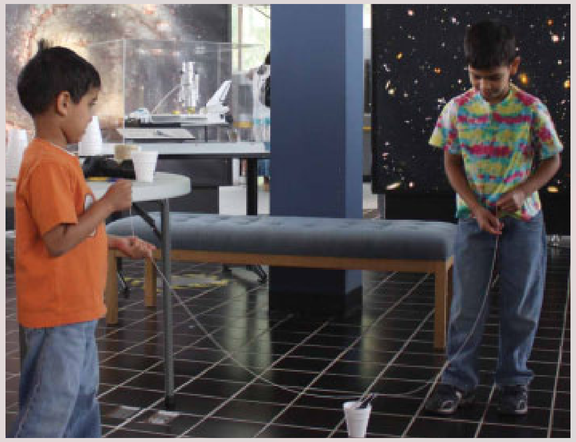
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2 Election Day	3	4	5	6
7 Daylight Saving Time Ends	8	9	10	11 Veterans Day	12	13
14	15	16	17	18	19	20
21	22	23	24	25 Thanksgiving Day	26	27
28	29	30				

Hinode Views Active Regions on the Sun

This image of the Sun was taken by the X-Ray Telescope (XRT) on board the Hinode spacecraft. XRT is capable of imaging very high temperatures of the Sun's atmosphere ranging from 2 million°C (the darkest color red) up to 15–20 million°C (light red to white coloring). These very high temperatures are associated with light that is emitted in X-ray form. When this image was taken on February 5, 2007, the Sun had three distinct active regions (AR) viewable from Earth where Hinode orbits just outside of the atmosphere. These ARs have a lot of energy stored from the Sun's magnetic and rotational activity that translates into the temperature in which it emits. This is why the ARs emit more X-rays and thus produce more light for XRT to gather up in that area of the image.

Hinode, Japanese for sunrise, is a mission that helps scientists understand the interaction between the Sun's magnetic field at its outer layer and determine how the Sun's explosive energy propagates through the different layers of the solar atmosphere.

Image Credit: NASA and the Japanese Aerospace Exploration Agency.



Children participate in the Sunday Experiment at the Goddard Space Flight Center Visitor Center. Credit: NASA.

OCTOBER 2010

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17	18	19	20	21	22	23
24/31	25	26	27	28	29	30

DECEMBER 2010

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NASA

DECEMBER **2010**

New Moon · First Quarter · Full Moon · Last Quarter

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25 Christmas Day
26	27	28	29	30	31	

Is it a Galaxy or a Huge Cosmic Storm?

At first glance the image above looks like it could be a huge storm in space rotating around a clear eye. (It even resembles the red symbol often used to represent hurricanes on a weather map.) But this is actually a Spitzer Space Telescope infrared image of a galaxy called NGC 1097, and located 50 million light-years from Earth. Like our own Milky Way, NGC 1097 has long spindly arms of stars. The "eye" of a hurricane is characterized by relative calm, but the "eye" at the center of this galaxy is actually a maelstrom so powerful that even light cannot escape the vortex—a monstrous black hole about 100 million times the mass of our Sun. In this color-coded infrared view from Spitzer, the area around the invisible black hole is blue and the ring of stars, white.

The ring around the black hole is bursting with new star formation. An inflow of material toward the central bar of the galaxy is causing the ring to light up with new stars. The galaxy's red spiral arms and the swirling spokes seen between the arms show dust heated by newborn stars. Older populations of stars scattered through the galaxy are blue. The fuzzy blue dot to the left, which appears to fit snuggly between the arms, is a companion galaxy. Astronomers say it is unclear whether this companion poked a hole in the larger galaxy, or just happens to be aligned in a gap in the arms.

Our own home galaxy—the Milky Way—also has a similar spiral structure with long, spindly arms of stars, and a black hole at its center. But the Milky Way's black hole is tame in comparison to that of NGC 1097, with a mass of only a few million Suns.

Image and Partial Text Credit: NASA/JPL-Caltech/The SINGS Team (SSC/Caltech).

Competitors in the Discovery Education 3M Young Scientist Challenge for students in grades 5 though 8. Credit: NASA.

NOVEMBER **2010**

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28	29	30				

JANUARY **2011**

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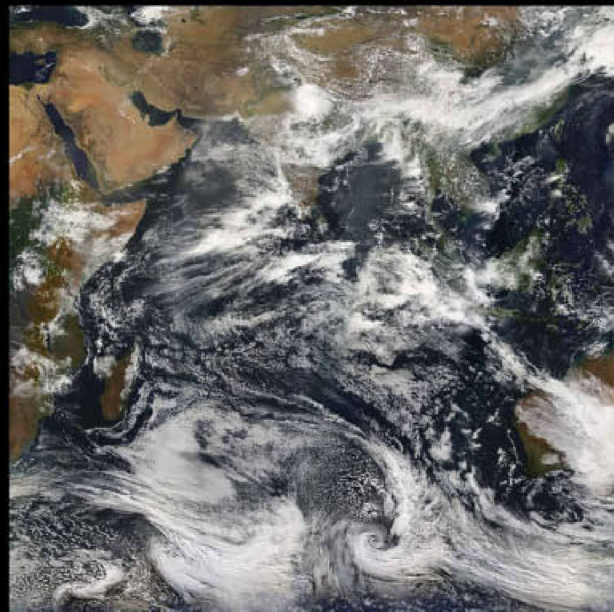
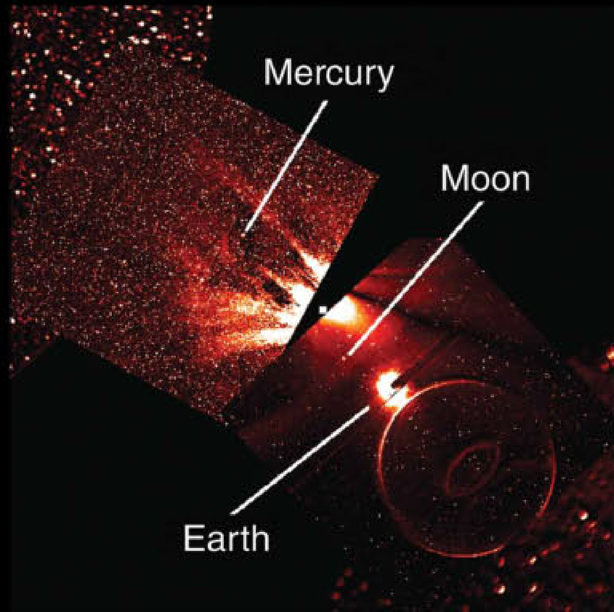
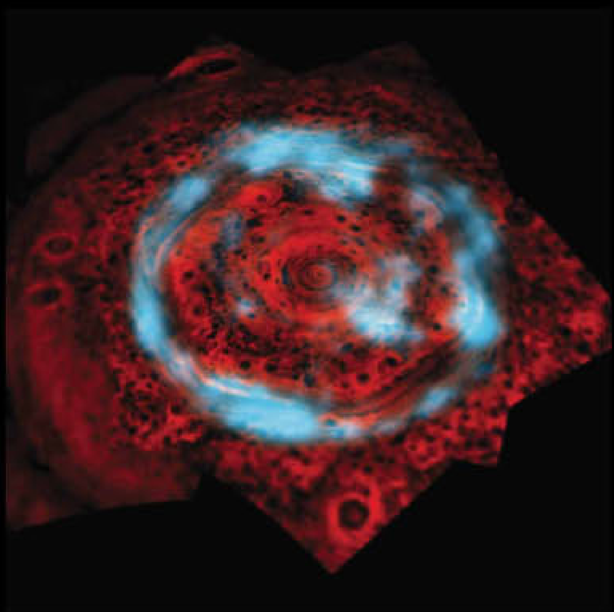
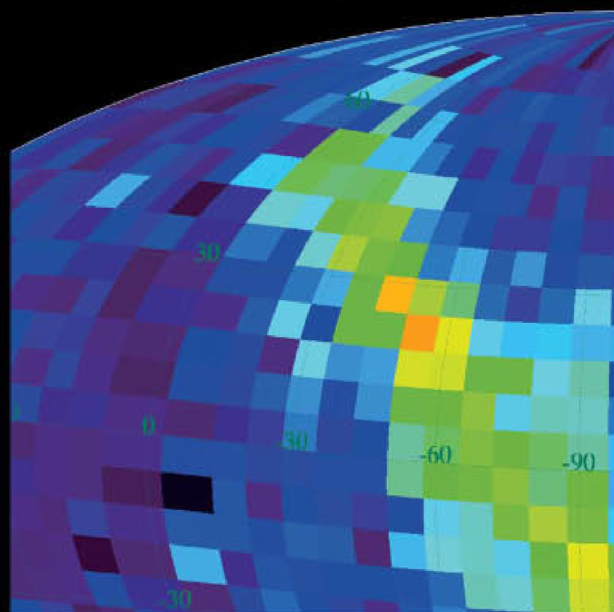
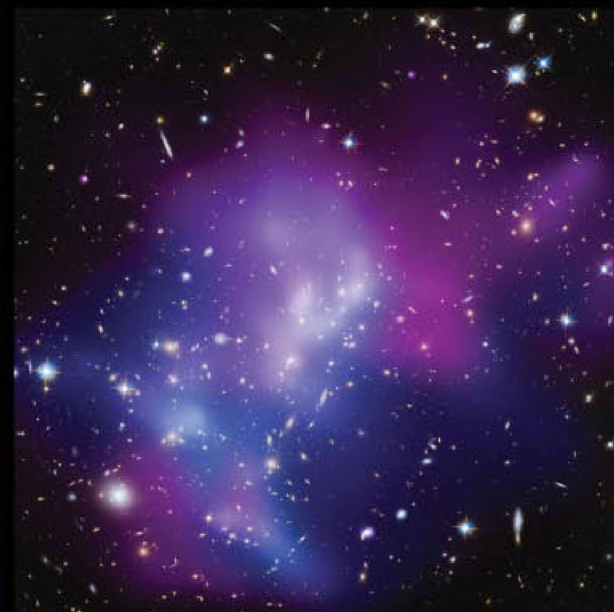
23/30	24/31	25	26	27	28	29

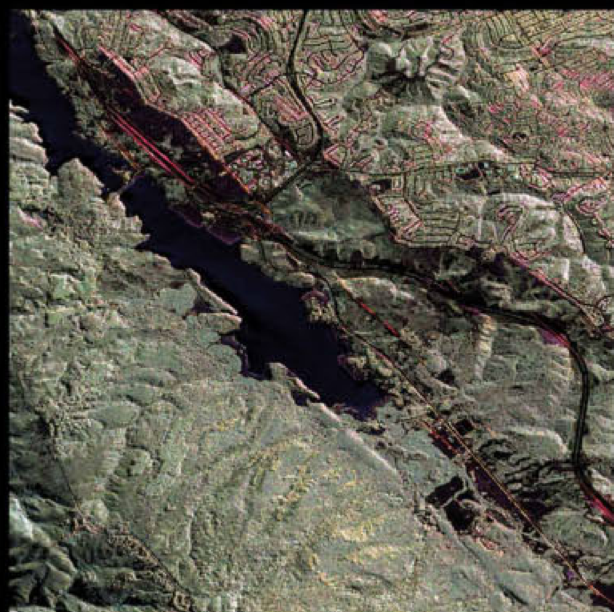


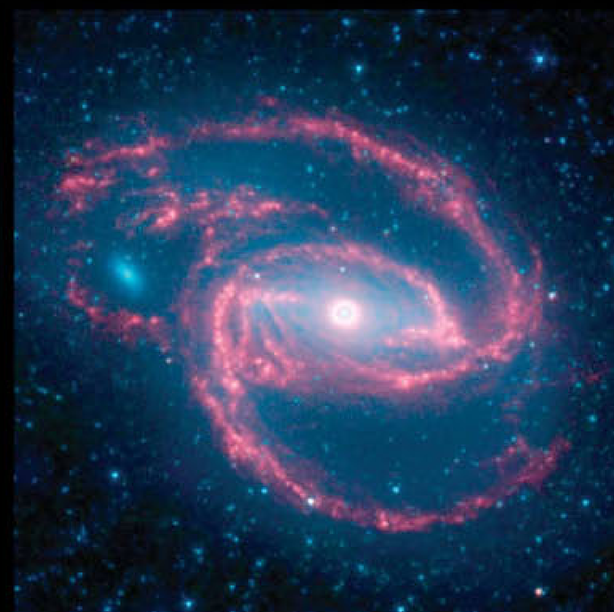












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