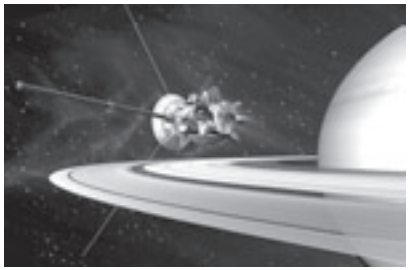
Saturn: Jewel of the Solar System.

We go into space to discover answers to questions as old as humanity itself, and to ask new ones.

In June 2004, NASA's Cassini–Huygens spacecraft performed a spectacular crossing through the ring plane, going into orbit around Saturn to return new information and incredible images. The spacecraft's onboard instruments will collect unique data that may answer many questions about the composition of the rings and help scientists gain a better understanding of the planet Saturn, its magnetosphere, its principal moon Titan, and its other moons – the small "icy satellites."

Saturn's beautiful rings set it apart from the other planets. Saturn has the most extensive and complex ring system in our solar system, extending hundreds of thousands of miles from the planet. Made up of billions of particles of ice and rock – ranging from the size of grains of sugar to houses – the rings orbit Saturn at varying speeds.

Four NASA spacecraft have been sent to explore Saturn. Pioneer 11 was first to fly past Saturn in 1979. Voyager 1 flew past a year later, followed by its twin, Voyager 2, in 1981. The Cassini spacecraft is the first to explore the Saturn system of rings and moons from orbit. The European Space Agency's Huygens probe successfully carried out its mission by dropping through Titan's thick atmosphere and landing on the surface in January 2005. The sophisticated instruments on the Cassini orbiter and the Huygens probe are providing scientists with vital data and the best views ever seen of the mysterious, vast Saturn system.



An illustration shows the Cassini–Huygens spacecraft as it enters Saturn orbit.

Saturn As Seen By the Ancient Astronomers.

The study of Saturn has its roots in the observations of the earliest stargazers. Around 700 B.C., the Assyrians described the planet as a twinkle in the night sky and named it the Star of Ninib. A few centuries later, in 400 B.C., the ancient Greeks named Saturn in honor of Kronos, the god of agriculture. Kronos (sometimes spelled Cronos or Cronus) was the Titan ruler and the father of Jupiter. The ancient Romans changed the name from Kronos to Saturnus, which is the root of Saturn's modern name. In Roman mythology, Saturnus was the god of sowing. In his honor, Saturnalia was celebrated during December – a seven-day event that became ancient Rome's most popular festival.

Saturn was one of seven celestial bodies that moved with respect to the rest of the stars. These seven "wandering stars" are actually the Sun, the Moon, Mercury, Venus, Mars, Jupiter, and Saturn. Six of these seven "wandering stars" provide the nomenclature for the names of the days of the week, with the exception of Wednesday and Thursday, which are named after ancient deities in Germanic mythology.

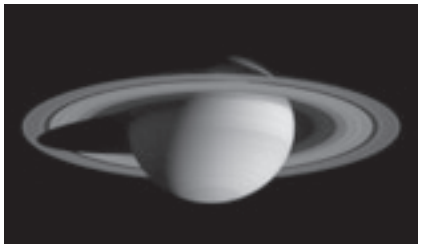
Telescopic Observations of Saturn.

The study of Saturn remained unchanged for many centuries. In the early 1600s, the Italian scientist Galileo Galilei built his own telescope and pointed it at the heavens. Though he was using a primitive telescope with only a power of 20, Galileo noticed that there was something different about Saturn. At first he assumed Saturn was a group of three close-knit planets, with two smaller planets on each side of a bigger one. Two years later, however, he noticed changes in Saturn's appearance that baffled him. The two smaller bodies had vanished and Saturn was now all by itself in the sky. Galileo wrote that he was "astonished" by the phenomenon. And a couple of years later, things became even more confusing for Galileo, when the two objects again appeared next to Saturn, but they were larger than before. I do not know what to say in a case so surprising," he wrote in despair. He eventually could only suggest that Saturn must have arms or "cup handles" that grew and disappeared for unknown reasons. Galileo died in 1642, never knowing that he'd been the first to observe Saturn's rings.

Confusion about Saturn continued until Christiaan Huygens, a Dutch astronomer, developed the concept of a planetary ring system in 1659. Using an improved telescope – with a magnification of 50 – Huygens theorized that the rings were solid, thin, and flat. The new idea provided a model for astronomers of the day, who were then able to understand what they were seeing. As the quality of telescopes continued to improve, features became easier to identify. In 1676, Jean-Dominique Cassini was able to see the biggest gap within the ring system, now known as the Cassini Division.

Exploring Saturn.

The Cassini–Huygens mission is designed to explore the Saturn system and all its elements: the planet, its atmosphere, its rings, its magnetosphere, its large satellite Titan, and its many known smaller icy satellites. The spacecraft consists of two independent elements – the Cassini orbiter and the Huygens probe.

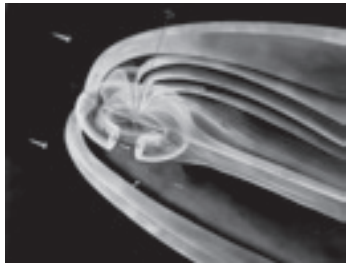


An image of Saturn and its rings, with the planet casting a dark shadow on one side of the rings.

Standing 22 feet high and equipped with 12 science instruments, the Cassini orbiter will make 76 orbits of Saturn and 45 close flybys of Titan over a four-year period.

The 12 science instruments are grouped into three basic categories: optical remote-sensing systems (spectrometers and imaging cameras that operate in different wavelengths); microwave remote-sensing systems (radar and radio science); and fields, particles, and waves. The last category includes instruments designed to study the intensity and dynamics of Saturn's magnetic field and the dust and plasma environment, search for lightning in Saturn's atmosphere, observe the upper atmosphere of Titan, and explore a wide range of other fields of study.

An illustration shows Saturn's magnetosphere, which is shaped like an enormous wind-sock around the planet.

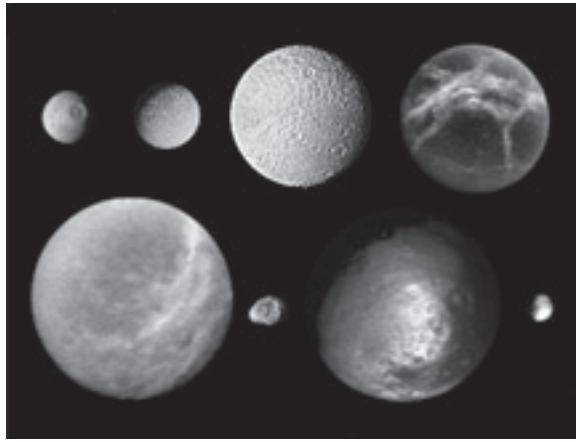


The Huygens probe was equipped with six science instruments designed to study the lower atmosphere and the surface of Titan. The probe was released from the Cassini orbiter on December 25, 2004, and spent 21 days in transit to Titan. On January 14, 2005, the Huygens probe plunged through Titan's atmosphere in a two and one-half hour journey of discovery. Data from the Huygens probe mission were relayed to the orbiter for transmittal back to Earth.

An image of a portion of Titan. The large moon is covered with a dense atmosphere, so no surface features appear in the image.

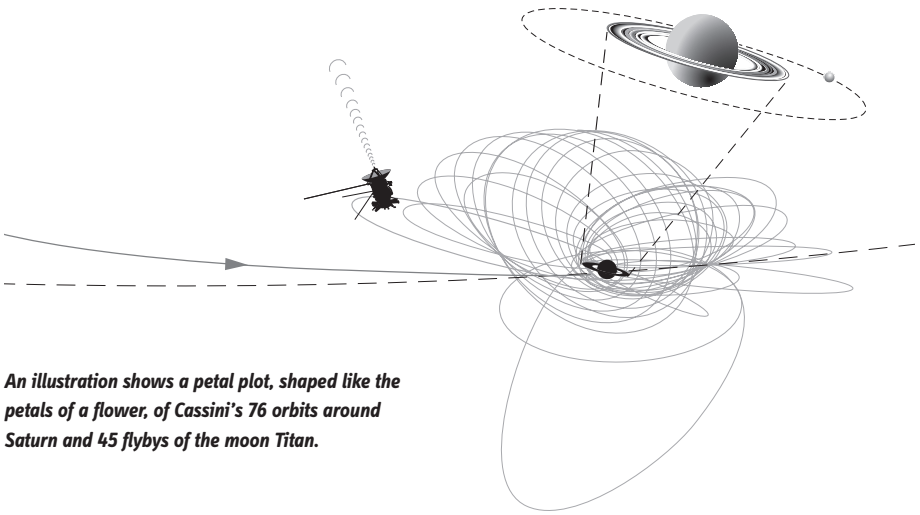
The Cassini–Huygens website is the information hub for data release, images, and scientific updates throughout the Cassini and Huygens missions. In addition, the European Space Agency provides myriad information about the Huygens mission on their website at *http://sci.esa.int/science-e/www/area/index.cfm?fareaid=12*.

The Cassini–Huygens mission is managed for the National Aeronautics and Space Administration (NASA) by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology. The European Space Agency (ESA) manages the Huygens probe mission. ESA and the Italian Space Agency (Agenzia Spaziale Italiana, ASI), as well as many European and American academic and industrial partners, have teamed with NASA to make the Cassini–Huygens mission a reality.



An composite image shows eight of Saturn's icy satellites and their relative sizes.

Touring Saturn.



An illustration shows a petal plot, shaped like the petals of a flower, of Cassini's 76 orbits around Saturn and 45 flybys of the moon Titan.

Cassini's tour of the Saturn system is divided into six different segments. Each segment contains many Saturn and Titan flybys as well as opportunities to study the different smaller satellites. For details on each segment of the tour, visit *http://saturn.jpl.nasa.gov/operations/saturn-tour.cfm*.

Segment #1 – Saturn Orbit Insertion (SOI) and Probe Release.

JULY 1, 2004 THROUGH FEBRUARY 15, 2005 (ORBIT SOI-3)

This is the first part of Cassini's journey at Saturn. The arrival of the spacecraft at Saturn (through SOI) and the deployment of the Huygens probe to Titan (January 2005) are major scientific milestones. These events determine the mission's success, and their results will shape the future of exploration around the ringed planet and the Huygens mission.

Segment #2 – Occultation Sequence.

FEBRUARY 15, 2005 THROUGH SEPTEMBER 7, 2005 (ORBIT 3–14)

Saturn's rings oscillate on a 15-year cycle. During this cycle, observers on Earth can see the rings clearly because they are tilted or "open." The rings then rotate and become nearly invisible to observers on Earth because the view becomes "edge-on" or "closed." When Cassini first arrived at Saturn, the rings were tilted, or open. This configuration of the rings allowed Cassini to see Earth and the Sun become obscured by the rings. This phenomenon is called an "occultation" and provides unique scientific opportunities, allowing scientists to derive information about the structure and evolution of the ring system.

Segment #3 – Petal Rotation and Magnetotail Petal.

SEPTEMBER 7, 2005 THROUGH JULY 22, 2006 (ORBIT 14–26)

Moving the spacecraft around in its orbit as viewed by Earth provides important science opportunities. It allows scientists to capture data in a wide swath of the planet's magnetosphere. One unique region is the magnetotail. This is the region facing away from the Sun where the planet's magnetosphere is squeezed by the solar wind.

Segment #4 – Titan 180 Transfer.

JULY 22, 2006 THROUGH JUNE 30, 2007 (ORBIT 26–47)

Early in the Saturn tour, Cassini passes Titan on its way in to Saturn. This is what engineers call an "inbound" pass. By shifting the spacecraft's encounters with Titan to the outbound leg, the spacecraft's orientation with respect to the Sun is flipped 180 degrees. This process takes several orbits of Saturn, allowing engineers to move Cassini's orbit with respect to capture different views of Saturn.

Segment #5 – Icy Satellite Campaign.

JUNE 30, 2007 THROUGH AUGUST 31, 2007 (ORBIT 47–49)

Immediately following the Titan 180 transfer sequence, the spacecraft makes several close flybys of the icy satellites to study these enigmatic moons in detail.

Segment #6 – High Inclination Sequence.

AUGUST 31, 2007 THROUGH JULY 1, 2008 (ORBIT 49–75)

Studying Saturn at steep angles (called high inclinations) is of extreme interest to scientists. Viewing Saturn's polar regions provides opportunities for studying Saturn's rings and magnetosphere. The high inclination sequence also allows for radio (from Earth), solar, and stellar occultations of Saturn, Titan, and the ring system. Such studies allow scientists to understand the nature of the material in Saturn, Titan, and the rings.

Saturn in the Classroom.

The Cassini–Huygens mission maintains a robust series of integrated learning modules for classroom educators in elementary and secondary environments. All materials are available to download or order from the education section of the Cassini–Huygens website *(http://saturn.jpl.nasa.gov/education/index.cfm)*.

All materials are aligned with National Science Education Standards and Language Arts standards of the National Council of Teachers of English.

Reading, Writing & Rings.
Building on the increasing demands to foster students' language arts skills, the Cassini–Huygens mission has developed a program integrating science and literacy called "Reading, Writing & Rings." Using Saturn as the content model, students learn different styles of writing and boost their reading skills through
two sets of modules. One set is designed for emerging readers in grades 1 and 2 while the other set is designed for grades 3 and 4. The grades 1 and 2 set consists of 10 lessons; the grades 3 and 4 set consists of 12 lessons.

Each lesson contains age-appropriate learning goals for language arts and science. These lessons provide multiple opportunities for young students to develop important literacy skills – reading, writing, and oral communication – and to expand and enrich their scientific understanding of Saturn and the Cassini–Huygens mission.

Saturn In Your Kitchen and Backyard.
Students in grades 5 and above will enjoy the interdisciplinary learning environment of "Saturn in Your Kitchen and Backyard." Each lesson in the series is focused on a specific science or engineering goal associated with the Cassini–Huygens mission. From light scattering to atmospheric heating, students work in teams to unlock the mysteries of Saturn. All materials are aligned with National Science Education Standards and are available on the Cassini–Huygens education website.

Ways of Seeing.
How does a spacecraft like Cassini use different wavelengths of light to study Saturn? The "Ways of Seeing" CD-ROM contains a wealth of information on the mission, the electromagnetic spectrum, and remote sensing. Lessons are scattered throughout this educational CD-ROM to enhance the students' learning experiences. Copies of the CD-ROM are available through NASA's Central Operation of Resources for Educators (CORE) at *http://core.nasa.gov*. "Ways of Seeing" is targeted for students in grades 5–8.

An illustration of the Cassini mission's Reading, Writing & Rings bookmark with the theme "The journey to Saturn begins in the classroom."

Reading, Writing & Rings.

This is an abridged version of Lesson 4 in the "Reading, Writing & Rings" module for grades 1 and 2. A complete version of this activity is available on the Cassini–Huygens education site at *http://saturn.jpl.nasa.gov/education/edu-k4.cfm*.

Amazing – Saturn Is So Far Away!

- Language Arts Focus – Writing an informational postcard
- Science Focus – Using a playground model to explore distance

OVERVIEW.

In this activity, students create an outdoor, to-scale model of the distances between the Sun, Earth, and Saturn. To get a glimpse of the vastness of space, you and your students will have to take a trip through the school yard. Through this walk, students begin to gain some understanding of how far away Saturn is from Earth and the Sun. Like enthusiastic travelers everywhere, students will write a "postcard home" to share their exciting trip!

PROCEDURE – PART ONE.

Exploring Distance on the Playground

(Much of this activity is done outside and is easier to carry out with the aid of another adult or older student.)

1. Distribute a "Cassini spacecraft" handout and popsicle stick to each student. Ask students to cut out the spacecraft and glue it to the stick.

2. Explain that you will be using a model to explore how far Saturn is from Earth. Tell students you will be going outside and walking across the yard to learn more about Cassini's voyage to Saturn.

3. Ask students to predict how many steps they will have to take to cover the distance between Earth and Saturn. Accept all predictions – even the wild ones! Post predictions on a large sheet of paper or overhead transparency.

5. Select a spot in the yard and mark it with the "Sun" signand place the large "Sun" ball next to it. (Allow plenty of space to do this activity – you'll need about 250 yards!)

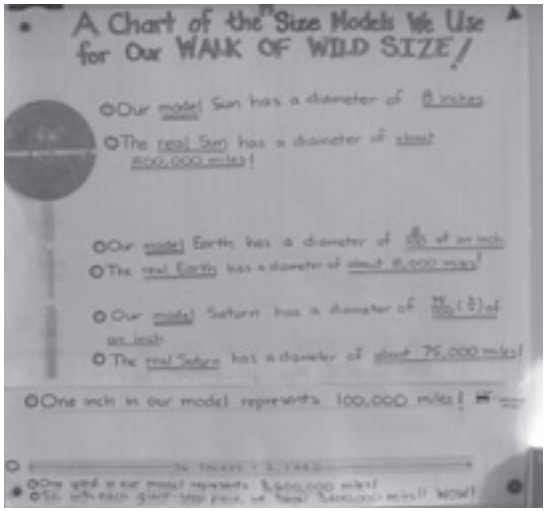
6. Explain to students that you will take "big steps" to pace off the distances. Model how to pace off distance. Begin your "big steps" and ask students to count along with you as you walk from the Sun toward Earth and on to Saturn. If you are using the optional roll of string, unravel it as you go along.

7. From the Sun, take 26 paces to reach Earth's location. Place the "Earth" sign in the ground.

8. To reach Saturn you will have to walk another 221 (!) paces. When you have reached Saturn, place the "Saturn" sign in the ground. (You'll see that some of those "wild" predictions may not have been so wild after all!)

9. At Saturn, ask students to look back at the Earth and Sun signs.

10. Discuss the model with your students.



A photograph of one class's "Walk of Wild Size," where the students wrote in their calculations of the size of the solar system based on a Sun diameter of 8 inches.

PROCEDURE – PART TWO.

Writing About Saturn.

1. Distribute "Postcard from Saturn" worksheets.

2. Show a postcard you (or one of your students) have received and explain the parts of the postcard. Using a worksheet, model writing a postcard – ask your students for the date, a salutation, and a message. After you have completed the postcard, sign it on one side and address it on the other. An overhead will make this easy for your students to follow.

3. Ask students to choose someone to write their postcards to – a friend, family member, or classmate.

4. Discuss with students how to describe the trip to Saturn. On the board, write vocabulary such as "distance," "pace off," "dim," "sunlight," "long time," "far away," "cold," and other student suggestions.

5. After students have completed writing their postcards, ask them to turn their postcards over and draw a diagram of Saturn, Earth, and the Sun.

6. Collect the postcards and display them on a board, or, so that both sides can be seen, from strings.

USING SCIENCE NOTEBOOKS.

Writing Prompts for This Lesson.

1. Focus questions: How far away is Saturn from Earth? If you were feeling cold and wanted to warm up, which planet would you visit – Earth or Saturn? Why?
2. Process question: What did you do to find out how far Saturn is from Earth?

Saturn in the Night Sky.

How does the novice observer learn to recognize Saturn in the evening sky? The first thing is to learn when the planet is visible in the night sky. Like all celestial bodies, Saturn is above the horizon at some point every day of the year. However, for large periods of time, Saturn is above the horizon during the day and thus is invisible. From 2004 through 2006, Saturn will begin to make an appearance in the pre-dawn hours in the late summer and is most prominent in the night sky during the winter months. The best viewing begins in mid-winter when Saturn is high in the evening sky.

What You Can See from Earth.

While Saturn is visible as a white dot against the black sky, viewing the planet through even a modest telescope will transform a viewer's experience. Any telescope with a magnification of at least 30 will reveal the rings. Although Saturn's seven main rings extend hundreds of thousands of kilometers into space, observers on Earth with small to modest telescopes can generally only detect the bright A and B rings.

Saturn has more than 30 known moons, but only a few are visible from Earth. Titan (Saturn's largest moon) orbits the planet at 10 planet diameters from the planet. Titan is the second largest moon in the solar system and is actually larger than either of the planets Mercury or Pluto. While Titan is easily recognized through a telescope, the moons Enceladus, Tethys, Dione, Rhea, and Iapetus can also be seen from Earth.

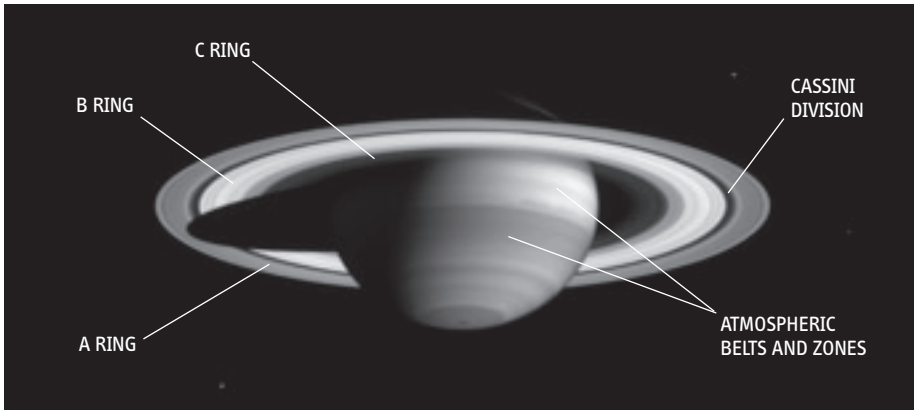
Join the Saturn Observation Campaign.

The Cassini–Huygens mission sponsors a worldwide observing campaign. Aimed at introducing Saturn to viewers of all ages, the Saturn Observation Campaign enlists amateur astronomers who offer viewing opportunities at schools, community events, star parties, and a host of other events. Some of the campaign's most active participants in the first year include a school teacher in Australia, a retired engineer in the Netherlands, a teacher in Greece, an amateur astronomer in California, and a Science Center in Ohio.

A photograph of some young astronomers using a telescope to look at the night sky.

Would you like to share the excitement and splendor of Saturn? You don't need a garage full of fancy equipment to join the campaign. A modest telescope and a love of planetary observation are the only requirements. Applications are accepted during the summer months. For details on application deadlines and submission procedures, visit the Saturn Observation Campaign website at *http://soc.jpl.nasa.gov.*

Looking for a unique event for your school science fair, scout troop, library program, or community event? The Saturn Observation Campaign is a perfect opportunity to engage your group in the wonders of space science and observation. The website maintains a database with contact information for all campaign members. Visit *http://soc.jpl.nasa.gov* to find a campaign member close to you.



An ilustration of Saturn that indicates the locations of the A, B, and C rings, the Cassini Division, and some of the atmospheric belts and zones.

Saturn in the Neighborhood.

While the Saturn Observation Campaign brings amateur astronomers into local communities for direct viewing of the ringed planet, the Cassini–Huygens mission supports a host of other programs designed to meet the needs of event planners.

Speaking on Saturn — The Solar System Ambassadors Program.
The Solar System Ambassadors program grew out of the tremendous public interest in the Galileo mission to Jupiter. Swamped with requests for speakers to present talks across the nation, Galileo ambassadors received historical information about Galileo and frequent updates on the spacecraft's health, data collection, and scientific discoveries. In turn, the ambassadors pre-sented Galileo mission results at venues across the country. The Solar System Ambassadors program is a broadened version of the Galileo ambassador program. Members of the ambassador network can speak about a host of missions including Cassini–Huygens. With members in all 50 states and Puerto Rico, chances are there is an ambassador near you to enhance Rotary Club luncheons, church group dinners, science fairs, library association talks, or any other public speaking venue. Visit the Solar System Ambassadors website at *http://www2.jpl.nasa.gov/ambassador/* to learn more about the program and to locate a member in your area.

Sharing Saturn with Youth Groups.
The Saturn Observation Campaign provides a unique experience for youth groups and school programs. The Cassini–Huygens website hosts materials designed to integrate classroom and informal learning environments with the excitement of seeing the rings and moons of the sixth planet. For detailed information on integrating the Saturn Observation Campaign with your specific group's needs, visit the "Youth Groups" section of the website at *http://saturn.jpl.nasa.gov/kids/youth-groups.cfm*. In addition, the Cassini Formal Education Lead can assist in tailoring programs for specific age groups and learning environments. Event planners can contact the Formal Education Lead through the Cassini Mail system on the Cassini–Huygens website *(http://saturn.jpl.nasa.gov/education/index.cfm)*.

Cassini Resources.

Internet.

CASSINI–HUYGENS.

http://saturn.jpl.nasa.gov or http://www.nasa.gov/cassini.

EUROPEAN SPACE AGENCY HUYGENS MISSION.

http://sci.esa.int/science-e/www/area/index.cfm?fareaid=12.

NASA.

http://www.nasa.gov.

E-Mail.

CASSINI E-MAIL HUB.

http://saturn.jpl.nasa.gov/news/contact-us.cfm.

MAILING LIST.

Sign up for mission updates through the project's e-mail service:
http://saturn.jpl.nasa.gov/news/mailing-list.cfm.

Activities.

SATURN OBSERVATION CAMPAIGN.

http://soc.jpl.nasa.gov.

SOLAR SYSTEM AMBASSADOR PROGRAM.

http://www2.jpl.nasa.gov/ambassador/.

Planetarium Show.

"RING WORLD" DVD.

http://saturn.jpl.nasa.gov/museums/index.cfm.

Educator Resources.

EDUCATIONAL MATERIALS ONLINE.

http://saturn.jpl.nasa.gov/education/index.cfm.

ADDITIONAL ASSISTANCE.

Contact Cassini Outreach by mail:

Cassini Public Engagement, MS 230-205.
Jet Propulsion Laboratory.
4800 Oak Grove Drive.
Pasadena, California 91109-8099.

NASA Educational Resources.

NASA's Central Operation of Resources for Educators (CORE) was established for the national and international distribution of NASA-produced educational materials in multimedia format. Educators can obtain a catalogue and an order form by one of the following methods:

NASA CORE
Lorain County Joint Vocational School
15181 Route 58 South
Oberlin, OH 44074-9799
Phone: (440) 775-1400
FAX: (440) 775-1460
E-mail: nasaco@leeca.org
Home Page: *http://education.nasa.gov/core*

Educator Resource Center Network (ERCN) makes additional information available to the education community, NASA has created the NASA Educator Resource Center (ERC) network. Educators may preview, copy, or receive NASA materials at these sites. Phone calls are welcome if you are unable to visit the ERC that serves your geographic area. A list of the centers and the regions they serve includes:

AK, Northern CA, HI, ID, MT, NV, OR, UT, WA, WY
NASA Educator Resource Center
NASA Ames Research Center, Mail Stop 253-2
Moffett Field, CA 94035-1000
Phone: (650) 604-3574

IL, IN, MI, MN, OH, WI
NASA Educator Resource Center
NASA Glenn Research Center, Mail Stop 8-1
21000 Brookpark Road
Cleveland, OH 44135
Phone: (216) 433-2017

CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT
NASA Educator Resource Center
NASA Goddard Space Flight Center, Mail Code 130.3
Greenbelt, MD 20771-0001
Phone: (301) 286-8570

CO, KS, NE, NM, ND, OK, SD, TX
Space Center Houston
NASA Educator Resource Center for NASA Johnson Space Center
1601 NASA Road One
Houston, TX 77058
Phone: (281) 244-2129

FL, GA, PR, VI
NASA Educator Resource Center
NASA Kennedy Space Center, Mail Code ERC
Kennedy Space Center, FL 32899
Phone: (321) 867-4090

KY, NC, SC, VA, WV
Virginia Air & Space Center
Educator Resource Center for NASA Langley Research Center
600 Settlers Landing Road
Hampton, VA 23669-4033
Phone: (757) 727-0900 x 757

AL, AR, IA, LA, MO, TN
U.S. Space and Rocket Center
NASA Educator Resource Center for NASA Marshall Space Flight Center
One Tranquility Base
Huntsville, AL 35807
Phone: (256) 544-5812

MS
NASA Educator Resource Center
NASA Stennis Space Center, Building 1100
Stennis Space Center, MS 39529-6000
Phone: (228) 688-3506
Toll Free: (800) 237-1821 Opt.#2

CA
NASA Educator Resource Center for NASA Jet Propulsion Laboratory
Village at Indian Hill
1460 East Holt Avenue, Suite 20
Pomona, CA 91767
Phone: (909) 397-4420

AZ and Southern CA
NASA Educator Resource Center for NASA Dryden Flight Research Center
38255 Sierra Highway
Palmdale, CA 93550
Phone: (661) 276-2445

VA and MD's Eastern Shores
NASA Educator Resource Center
GSFC/Wallops Flight Facility
Visitor Center Building J-17
Wallops Island, VA 23337
Phone: (757) 824-2298

Regional Educator Resource Centers offer more educators access to NASA educational materials. NASA has formed partnerships with universities, museums, and other educational institutions to serve as regional ERCs in many states. A complete list of regional ERCs is available through CORE, or electronically via the NASA Portal at *http://education.nasa.gov/ercn*.

The NASA Portal serves at the gateway for information regarding content, programs, and services offered by NASA for the general public and, specifically, for the education community with the goals to inform, involve, and inspire. NASA's goal is to improve interactions for students, educators, and families with NASA and its education resources. Visit the NASA Portal and begin a journey of personal discovery – *http://www.nasa.gov*.

NASA's Education Home Page serves as the education portal for information regarding educational programs and services offered by NASA for the American education community. This high-level directory of information provides specific details and points of contact for all of NASA's educational efforts, Field Center offices, and points of presence within each state. Visit this resource at *http://education.nasa.gov*.

NASA features electronic resources specifically developed for the educational community. To locate these resources, visit the NASA home page at *http://www.nasa.gov*; click on the "For Educators" bar, then click on the grade level you are interested in.

NASA Television (NTV) features International Space Station (ISS) and Space Shuttle mission coverage, live special events, interactive educational live shows, electronic field trips, aviation and space news, and historical NASA footage. Programming includes the Video (News) File, NASA Gallery, and Education File, beginning at noon Eastern and repeated four more times throughout the day. Check the Internet for program listings at *http://www.nasa.gov/multimedia/nasatv/*.

For more information on NTV, contact: NASA TV, NASA Headquarters, Washington, DC 20546-0001, phone: (202) 358-1308.

NTV Weekday Programming Schedules (Eastern Times)
Video File – 6–7 a.m., 10–11 a.m., 12–1 p.m., 3–4 p.m., 6–7 p.m., 10–11 p.m., 12–1 a.m.
NASA Gallery – 1–6 a.m., 1–3 p.m.
Education File – 8–10 a.m., 4–6 p.m., 8–10 p.m.
ISS Mission Coverage – 7–8 a.m., 11 a.m.–12 p.m., 7–8 p.m., 11 p.m.–12 a.m.

Saturday and Sunday: The weekday schedule repeats on Saturday and Sunday with one exception: the 8 a.m. Education File runs an additional two hours, until noon instead of 10 a.m. Live feeds preempt regularly scheduled programming.

How to Access Information on NASA's Education Program, Materials, and Services (EP-2002-07-345-HQ) – This brochure serves as a guide to accessing a variety of NASA materials and services for educators. Copies are available through the ERC network or through the NASA Education Home Page at *http://education.nasa.gov*.

EDUCATORS

Please take a moment and evaluate this product at
http://ehb2.gsfc.nasa.gov/edcats/educational_wallsheet
Your evaluation and suggestions are vital to continually improving NASA educational materials.
Thank you.

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California
JPL 400-1215 5/05