



## Discover the Universe with NASA During the International Year of Astronomy 2009!

### Why IYA2009?

The vision of the International Year of Astronomy 2009 (IYA2009) is to help the citizens of the world rediscover their place in the Universe through the daytime and nighttime sky, and thereby engage a personal sense of wonder and discovery. Highlighted by the 400<sup>th</sup> anniversary of Galileo's first astronomical observations, the Year provides an outstanding opportunity to engage learners of all ages in one of the oldest fundamental sciences.

### How can we participate?

Over 100 countries, including the US, are actively planning a wide variety of programs and activities to celebrate astronomy and its contributions to society and culture. NASA invites you and your audiences to discover the universe through the many resources and activities described below!

### What programs and activities are available?

Use NASA's latest scientific discoveries and space science missions to inspire and engage your audiences in key ideas in science and technology. Take a look and stay tuned for calendars and additional information on NASA's IYA2009 website ([astronomy2009.nasa.gov](http://astronomy2009.nasa.gov))!

**NASA Science Feature of the Month:** During each month of the International Year of Astronomy, NASA's IYA2009 website will highlight key NASA missions, scientific discoveries, and night-sky wonders that you can discover with your own observations and explorations. We'll also connect you to related NASA resources and events. Join us each month of IYA2009 as we explore:

January	Telescopes and Space Probes: Today's Starry Messengers	Venus
February	Our Solar System	The Moon
March	Observing at Night... and in the Day	Saturn
April	Galaxies and the Distant Universe	The Whirlpool Galaxy
May	Our Sun	The Sun
June	Clusters of Stars	The Hercules Cluster
July	Black Holes	Our Galaxy: the Milky Way
August	Rocks and Ice in the Solar System	Perseids
September	Planets and Moons	Jupiter
October	What is the Fate of the Universe?	Andromeda
November	The Lives of Stars	The Crab Nebula
December	Discovering New Worlds	The Orion Nebula

**Discover the Universe with NASA – IYA Training Programs:** NASA's space science missions are working together to provide you with the knowledge and materials you need to discover and share the universe with your audiences. Explore Earth's place in the universe; light, energy, and optics; and, models and evidence while investigating how NASA's spaced-based missions extend Galileo's legacy. Discover how to find and use NASA content and resources in the classroom, after-school programs, libraries, science centers and museums. Find out how to connect to the international IYA2009 Galileo Teacher Training Program and US Families and Classrooms efforts, such as Project Astro ([http://www.astrosociety.org/education/astro/project\\_astro.html](http://www.astrosociety.org/education/astro/project_astro.html)).

### **Modeling the Universe Workshop: An Exploration of Space and Time**

Several of our workshop activities are drawn from the "Modeling the Universe" professional development short course developed by a team of education and public outreach professionals from NASA's astrophysics missions. Download these activities and more at:

<http://www.cfa.harvard.edu/seuforum/mtu/>

### **Active Astronomy**

This suite of standards-based activities explores visible and "invisible" forms of light while highlighting the important role that the electromagnetic spectrum plays in both our lives and in astronomy.

[http://www.sofia.usra.edu/Edu/materials/edu\\_materials.html](http://www.sofia.usra.edu/Edu/materials/edu_materials.html)

### **Online Assessment Tools**

The assessment questions used in Discover the Universe with NASA workshops are drawn from the "Misconception-Oriented Standards-based Assessment Resources for Teachers" (MOSART). Log on to the MOSART website to download research-based resources for probing conceptual understanding about the universe and how students learn. Each instrument comprises a set of multiple-choice items that are linked to the K-12 physical science and earth and space science content in the NRC's "National Science Education Standards," as well as to the research literature documenting common science misconceptions. Find out if your IYA programs are resulting in astronomy learning.

<http://www.cfa.harvard.edu/smgphp/mosart/index.html>

### **Great Explorations in Math and Science (GEMS) Space Science Sequences**

Our workshops draw from these coherent sequences of units developed for grades 3-5 and 6-8, developed by the Lawrence Hall of Science with NASA and with leading astronomy educators and researchers, assessment experts, and GEMS curriculum development staff.

<http://www.lawrencehallofscience.org/gems/CurriculumSequences.htm>

### **Space Science Education Resource Directory**

Discover a wealth of products for use in classrooms, science centers, museums, and other settings in this searchable online catalog. You will find standards-based curriculum support tools from the Hubble Space Telescope's Amazing Space program, solar system activities using NASA data, materials to strengthen understanding of the seasons, the connection between the Earth and the Sun, and more!

<http://teachspacescience.org>

**Make Your Own Observations:** From simple guidance for backyard observing of the planets, stars, and beyond; to your own personal guest observer account to take images with NASA-funded online telescopes; to exciting ways to access and use real NASA image data from space science missions — NASA will be providing a variety of tools and opportunities for you to follow in Galileo's footsteps. Begin your explorations today with these programs:

**MicroObservatory Online Telescopes**

Explore the universe using working telescopes that you control over the Internet. In 2009, the MicroObservatory team will debut a special "Observing With NASA" portal to the telescopes to help users compare their OWN images and data to those of NASA missions.

<http://mo-www.harvard.edu/MicroObservatory/>

**The Night Sky Network and the IYA2009 Cosmic Companion**

Through a partnership between the Astronomical Society of the Pacific and NASA, Night Sky Network amateur astronomy clubs and other educators will have access to a Cosmic Companion of activities and resources coordinated with NASA's monthly science features. Partner with an amateur astronomy club in your area to observe the universe during IYA2009!

<http://nightsky.jpl.nasa.gov/> and <http://www.astrosociety.org/>

**Saturn Observing Campaign**

The Saturn Observing Campaign gives sky enthusiasts of all abilities the opportunity to share the splendor of Saturn with their local community. The program offers a variety of program elements for local community leaders, classroom educators, youth group leaders, and sky enthusiasts.

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

**Stardust@Home**

Join the hunt for tiny particles of interstellar dust that originate in distant stars. Scientists estimate that the Stardust spacecraft collected 45 interstellar dust particles in its dramatic encounter with the comet Wild 2.

<http://stardustathome.ssl.berkeley.edu/>

**The Sun – Yours to Discover**

Sun-Earth Day 2009 celebrates Galileo's first telescopic observations of sunspots. This event will enable thousands of people to safely observe the Sun.

<http://sunearthday.gsfc.nasa.gov/>

**Community Events:** You'll be able to discover the universe with NASA in YOUR community during IYA2009 through partnerships we're establishing with centers of informal science education nationwide. For example, early in 2009 science education organizations all over the country will be unveiling spectacular images from NASA's Great Observatories — Hubble, Spitzer, and Chandra. Be on the lookout as well for NASA exhibits and family-science events at libraries across the country, and events and shows at the local museum or planetarium.

**Museum Alliance**

The Museum Alliance is a community of practice and a learning network composed of staff (education, science, exhibit, multimedia, and management) at museums, science centers, planetariums, observatories, NASA Visitor Centers, zoos, aquariums, botanical gardens, and nature centers who wish to share NASA content and resources with their local audiences. Join to stay abreast of NASA IYA2009 plans and resources for you!

<http://informal.jpl.nasa.gov>

## **Which NASA space science missions will be in the news?**

NASA's three Great Observatories, the Hubble Space Telescope (with brand new science instruments installed during Servicing Mission 4), the Chandra X-Ray Observatory, and the Spitzer Space Telescope, as well as many smaller missions will continue to bring us dramatic views and insights into our universe during 2009. Follow MESSENGER as it makes its third flyby of Mercury in September 2009, and stay-tuned for new discoveries about our Sun, the boundary of our solar system, and supermassive black holes from the Solar Dynamics Observatory, Interstellar Boundary Explorer, and Gamma-ray Large Area Space Telescope – all launching in 2008.

New missions scheduled to launch in 2009 include the planet finding mission, Kepler; the Mars Science Laboratory, which will collect and analyze Martian soil and rock samples; and, the Wide-field Infrared Surveyor Explorer (WISE), which will provide a complete inventory of nearby young stars and their dusty disks.

The Lunar Crater Observation and Sensing Satellite (LCROSS), a companion payload to the 2008 Lunar Reconnaissance Orbiter, is scheduled to send a rocket crashing into the Moon in search of water early in 2009. Mission scientists estimate that the resulting impact plume may be visible through amateur-class telescopes with apertures as small as 10 to 12 inches.

Visit NASA's Science Mission Directorate website to learn more about these and many other missions!  
<http://nasascience.nasa.gov/>

## **Where can we learn more about the International Year of Astronomy?**

**International:** Learn about Global Cornerstone projects for IYA2009, including three US-led projects: the Galileoscope, Dark Skies Awareness, and the From the Earth to the Universe image exhibition.  
<http://astronomy2009.org>

**United States:** Together we aim to provide an engaging astronomy experience to every person in the country, nurture existing partnerships, and build new connections to sustain public interest. Join the celebration!  
<http://astronomy2009.us>

**NASA:** NASA invites you to join us in the celebration of IYA2009. This website will be your portal to exciting NASA resources, events and opportunities for students, educators, and the public.  
<http://astronomy2009.nasa.gov>