

ENRICHMENT

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Searching for Saturn

“When one wishes to use science to enrich our culture, one should view science as a form of art.”

UKICHIRO

NAKAYA

(Scientist and inventor of the first artificial snow crystals)

Throughout human history, scientific discoveries have influenced art, culture, and mythology. Sometimes the value and beauty of a discovery or invention is a matter of interpretation. For example, automobiles have been perceived both as pretty machines that represent freedom, power, and progress, or as ugly machines that pollute the air, cause traffic jams, and produce lots of noise. Both points of view can be correct at the same time. The image of Saturn and its rings is familiar to almost everyone; it symbolizes the very idea of a planet. To help students understand how deeply the image of a planet with rings has penetrated concepts of art and design, have them look for Saturn images in everyday objects.

ACTIVITY

How has the appearance of this planet become a familiar part of our lives? How often do we see a Saturn image in modern culture? There is even an automobile called Saturn! Have students search for the shape of Saturn and list the places they find depictions of the planet. Students can cut out examples of Saturn from catalogs and magazines, and put the pictures on a large bulletin board or in a scrapbook. Sources include mail-order catalogs, magazines, and newspapers. Images of Saturn appear on many products, such as garden sundials, blankets and bedspreads, clothing, wrapping paper, candle holders, dinner



Artist's concept of an imaginary ringed planet.

plates, T-shirts, hanging mobiles, and in advertisements for computer software and other products. The World Wide Web offers another possibility for searching for images of Saturn.

TOPICS

How are the artistic images of Saturn different from real photos of the planet? Compare the Voyager image of Saturn from Lesson 1 with illustrations, painting, or computer art. Are some of the drawings out of proportion, made up of unrealistic colors and patterns, or drawn as cartoons?

EQUIPMENT, MATERIALS, AND TOOLS

For the teacher

Overhead projector

For each student

Catalogs and magazines; scissors

Scrapbook or bulletin board

World Wide Web access

Materials to reproduce

FIGURE	TRANSPARENCY
1	1
2	1
3	1



Background for Enrichment 1

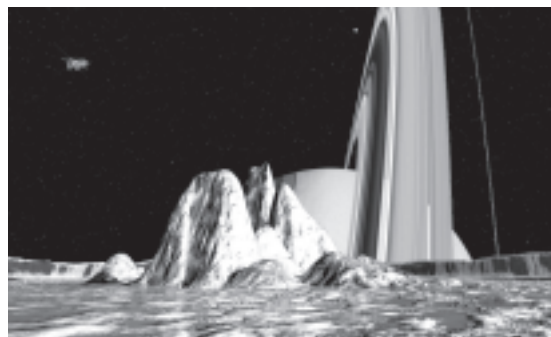
Here are three examples of how Saturn has been portrayed using different methods: computer art, painting, and a modern poster that was inspired by a magazine printed in 1926. The three examples can be prepared as transparencies (enlargements appear as Figures 1, 2, and 3 under “Materials”), displayed for the students, and discussed in terms of how Saturn and its moons are portrayed using different media, and how realistic the images are compared with photographs taken by Voyager. The full-color versions can be found on the Cassini website at JPL — each of the three figures shows the website for that figure.

Computer Art

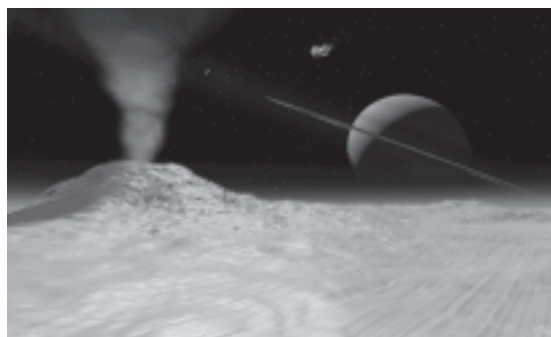
At the Jet Propulsion Laboratory, computer software that had been used to make computer images during the Voyager flybys of Jupiter and Saturn in the 1980s was used to create imaginary space art. The Saturn moon drawings shown here, as well as many other illustrations of Saturn and its moons, can be found on the Cassini website at: <http://www.jpl.nasa.gov/cassini/Images>.



This computer art shows the surface of Pandora, one of the shepherd moons of Saturn's F ring. The F ring is the bright, wispy material on the left side of the picture. Prometheus, the companion shepherd moon, can be seen at the top of the picture on the inner side of the F ring. The Cassini spacecraft is at the upper right.



This artist's view is from the surface of Mimas, whose unusual appearance inspired its nickname as the “Death Star” moon. This computer art shows the icy central mountains of the crater Herschel, with the crater walls visible in the distance. The Cassini spacecraft is at the upper left.

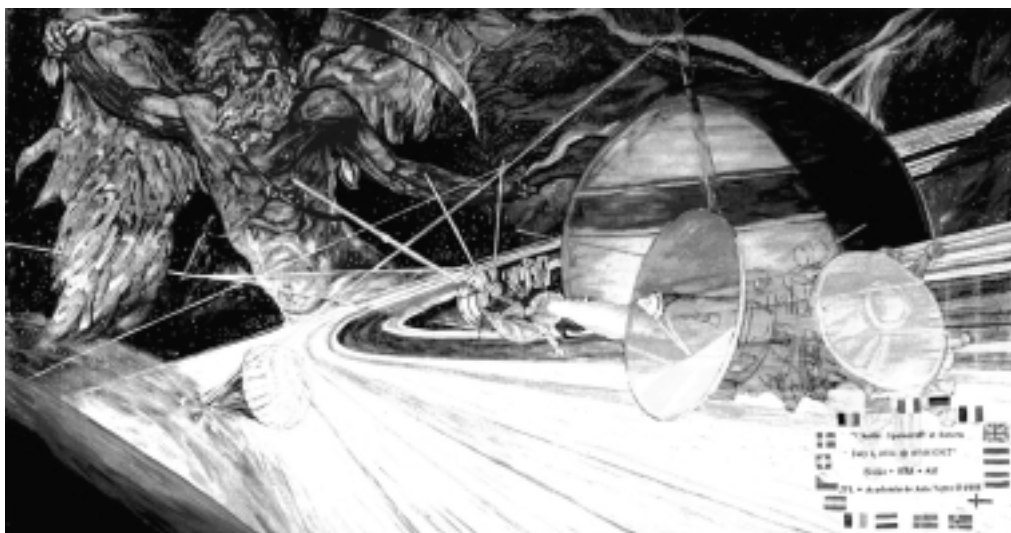


This computer illustration shows the bright surface of Enceladus, with an ice geyser shooting a jet of vapor into space. Ice geysers may be responsible for supplying the E ring's tiny ice particles. The Cassini spacecraft can be seen above and to the left of Saturn.

Painting

The Cassini mural resulted from a collaboration between the Cassini–Huygens mission and eight young master painters of the Academia de Arte Yepes in Los Angeles. The artists are Gabriel Estrada, Ulysses Garcia (leader), Abel Gonzales, Daniel Gonzales, Octavio Gonzales, Rebeca Robles, Juan Solis, and Francisco Vasquez.

The Academia de Arte Yepes gives promising young Hispanic painters an opportunity to develop their talents and skills. The idea of a mural designed around Cassini and Saturn gave the



The Cassini mural was a collaboration between the Cassini-Huygens mission and eight young artists.

painters a chance to try out their artistry in combining science and mythology. In the mural, the mythological Roman god Saturn is represented as the symbol of Time drawing back a veil to allow the Cassini spacecraft to reveal the mysteries of the vast Saturn system. The Cassini spacecraft is shown firing its main engine to brake into orbit around Saturn in July 2004. Beneath the spacecraft lies the sheet of icebergs and particles that make up the magnificent rings. Nearly transparent images of the spacecraft and the Huygens Titan probe represent important moments in the mission. Flags of some of the countries participating in the Cassini-Huygens mission are painted in the lower right-hand corner.

The "AMAZING SATURN" Poster

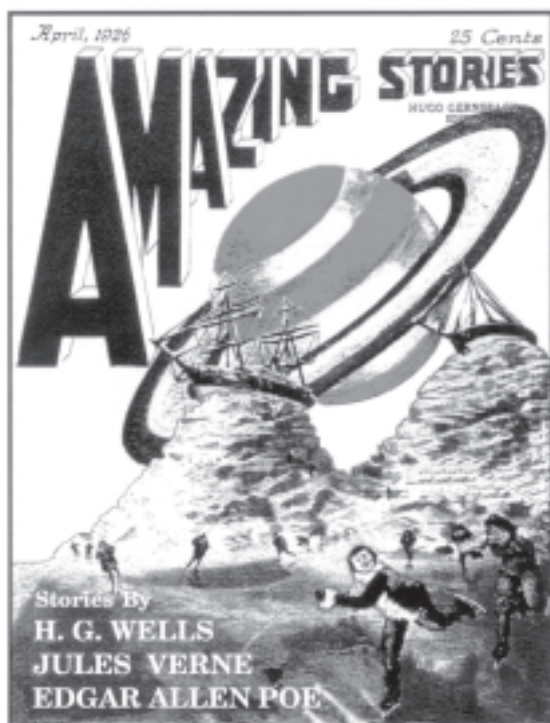
AMAZING STORIES was a science-fiction magazine first published in April 1926. The cover's appearance was distinctive, with its title in large block letters appearing to shrink into the distance. AMAZING STORIES brought science, technology, and the idea of space exploration to the general public, and had readers all

over the world. The legacy of the original AMAZING STORIES and its art style can be seen in such movies as *War of the Worlds*, *Forbidden Planet*, *2001: A Space Odyssey*, *Raiders of the Lost Ark*, and *Star Wars*.

The Cassini-Huygens poster uses a painting of Saturn rising behind the moon Titan as the Huygens probe parachutes to the surface. TSR, Inc., the company that owns the distinctive trademark, gave permission to copy the art style for the poster's title.

To create a dramatic image, the artist exaggerated certain features:

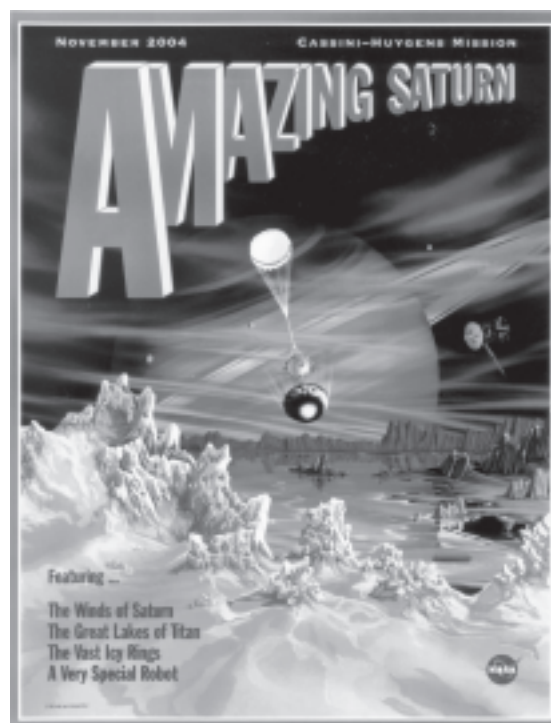
- The painting portrays the Huygens probe nearing the surface of Titan after being released from its parachute. (The probe is due to land on Titan in November 2004 after a 2.5-hour descent through the atmosphere.) In reality, the deployment of the Huygens probe's heat shield would happen much higher up in Titan's atmosphere than is depicted in the painting.
- The angular size of Saturn in the Titan sky is correctly portrayed, but the rings are tilted more than they would be. In reality, Titan



The cover of the first issue of **AMAZING STORIES**, April 1926, shows happy space travelers skating on the icy surface of a moon of Saturn. **AMAZING STORIES** is a registered trademark of TSR, Inc. (Used with permission.)

orbits so close to the ring plane that the rings would appear as a mere wisp of an edge. Actually, Titan's atmosphere is probably too thick for an imaginary traveler to see Saturn from the surface, and certainly it would be too hazy to permit Saturn to be seen close to the horizon.

- Tremendous artistic license has been taken in showing the Cassini orbiter in the sky. In real-



The **AMAZING SATURN** poster, with a title in the style of **AMAZING STORIES**, shows an imaginary concept of the Huygens probe descending to the surface of Titan, with Saturn and the Cassini spacecraft in the background.

ity, Cassini would appear more like a star, but in any event, it could not be seen through Titan's clouds.

- Many scientists hypothesize that there are cold lakes of liquid hydrocarbons on Titan, as shown in the painting. The hills are probably more rounded than depicted. The brownish, orangish (in the color version) organic sludge on the terrain is a real possibility.

Materials

Figure 1 **Saturn Moons (2 pages)**

Figure 2 **The Cassini Mural**

Figure 3 **AMAZING STORIES and AMAZING SATURN**



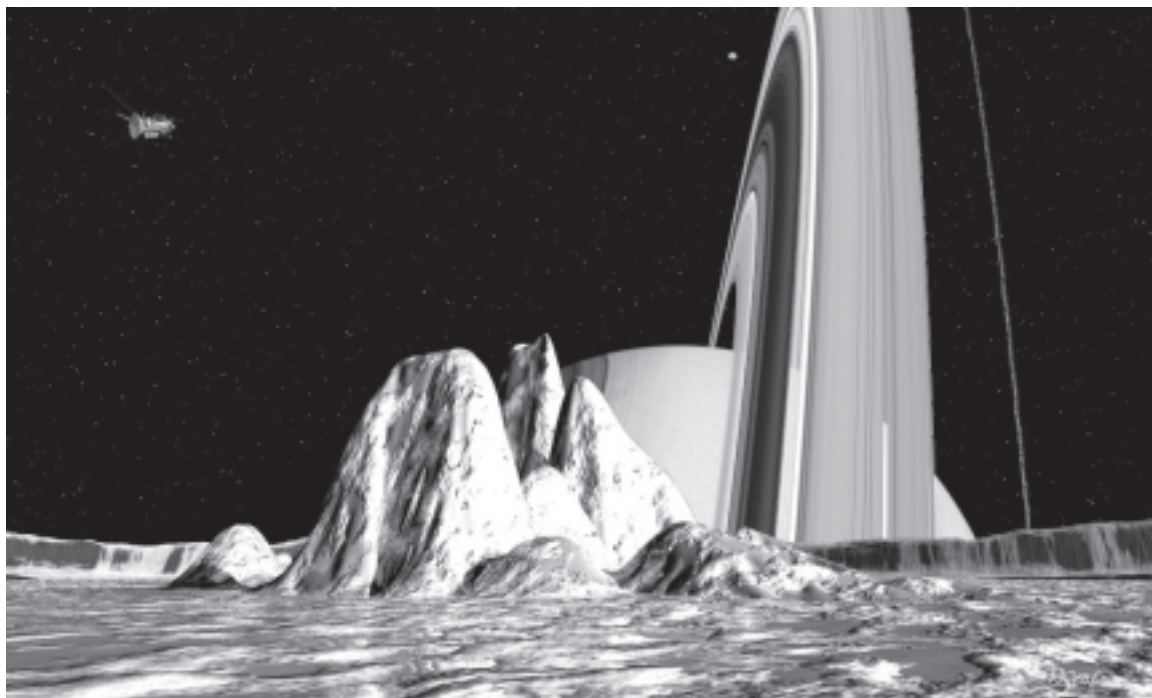
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Figure 1

See the
full-color
versions on the
Cassini website
at: [http://
www.jpl.nasa.gov/
cassini/Images/
artwork](http://www.jpl.nasa.gov/cassini/Images/artwork)

Saturn Moons (1 of 2)

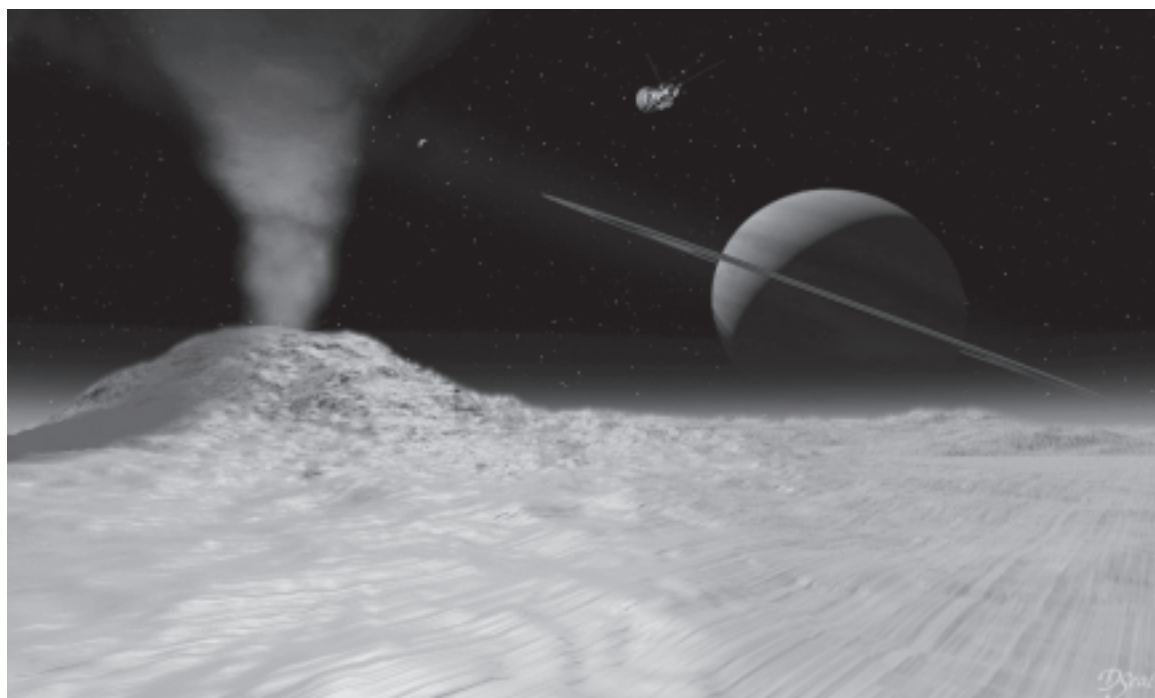


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Figure 1

Saturn Moons (2 of 2)



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Figure 2

See the full-color version on the Cassini website at: <http://www.jpl.nasa.gov/cassini/what/whatshot.html>

The Cassini Mural



AMAZING STORIES and AMAZING SATURN

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Figure 3

See the full-color version of the poster on the Cassini web site at: <http://www.jpl.nasa.gov/cassini/what/whatshot.html>

