Teacher Guide
Cool Career

Planetary Scientist
Carolyn Porco
Space Science Institute

Ring Around the Planets
Call her a scientist with a thing for rings. Carolyn Porco studies the magnificent sheet of rings that surrounds Saturn—as well as those around Jupiter, Uranus, and Neptune. Her work has helped to explain what rings are—billions of bits of ice zipping around in the same direction as they orbit a planet. Her work has also helped to explain how rings interact with moons to create ringlets.

Hello, Saturn
Carolyn also keeps an eye on Saturn with her team. "We never tire of seeing this gorgeous giant," she says. The team chooses which images the Cassini spacecraft takes of Saturn and its rings and moons, including mysterious Titan. As *Cassini* orbits Saturn, it is giving scientists their closest views yet of the ringed planet.

An imaging scientist studies pictures captured by spacecraft and Earth telescopes to learn more about objects in space. Carolyn studies planets with rings. **Other imaging scientists**
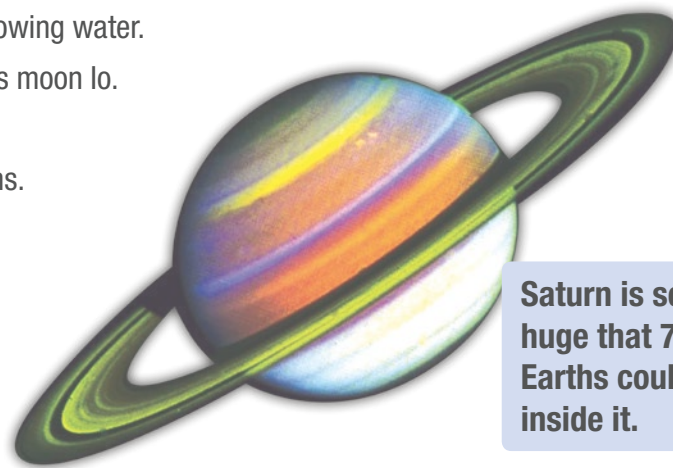
> examine gullies on Mars for evidence of flowing water.
> study volcanic plumes rising from Jupiter's moon Io.
> track swirling storms on Saturn.
> pick landing spots for future Moon missions.

Extra-terrific! When Carolyn was working on the next *Star Trek* movie, a model of ET was in the studio.

Saturn is so huge that 750 Earths could fit inside it.

Carolyn takes a break from her mission of unraveling the mysteries of Saturn.

After you read about Carolyn Porco, do these activities.

Wide, Wide World

Our planet is huge, right? Compare Earth to its neighbors in space. Earth's diameter is 12,756 kilometers (7,926 miles). Knowing this, calculate the approximate diameters of Mars, Saturn, and our Sun—in kilometers, and in miles.

> The diameter of Mars is about one-half that of Earth.
> The diameter of Saturn is about nine times that of Earth.
> The diameter of our Sun is about 109 times that of Earth.

Make a list of the three planets and our star, the Sun. Put them in order from smallest in diameter to largest in diameter. Where does our planet rank? *[Students can calculate the unknown diameters in kilometers and in miles as separate calculations. Or, they can calculate the diameter in kilometers and then use a conversion factor (1 kilometer = 0.6 miles) to find the diameter in miles. Answers will vary slightly between these two methods due to rounding.]*

Diameter of Mars: *[6,378 kilometers (3,963 miles) (12,756 kilometers x 1/2 = 6,378 kilometers) (7,926 miles x 1/2 = 3,963 miles)]*

Diameter of Saturn: *[114,804 kilometers (71,334 miles) (12,756 kilometers x 9 = 114,804 kilometers) (7,926 miles x 9 = 71,334 miles)]*

Diameter of the Sun: *[1,390,404 kilometers (863,934 miles) (12,756 kilometers x 109 = 1,390,404 kilometers) (7,926 miles x 109 = 863,934 miles)]*

Order of planets and Sun, from smallest to largest: *[Mars, Earth, Saturn, Sun. Earth ranks as the second smallest in this group.]*

Is Anyone Out There?

Carolyn was a consultant on the science fiction movie *Contact*. It was about searching for life beyond our planet. Do you think life exists on other planets or even moons? Write a paragraph explaining why or why not. *[Before students write their paragraphs, encourage them to do some research on the SETI (Search for Extraterrestrial Intelligence) Institute's website at www.SETI.org to see how scientists are seeking evidence of life elsewhere in our Universe. Remind students to state a clear opinion and to support their opinion with relevant scientific evidence.]*