

# SCIENCE NEWS®

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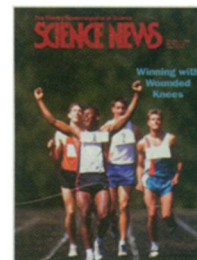
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Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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## Publisher's Letter

During my 3-year tenure as president of Science Service and publisher of SCIENCE NEWS, our outreach efforts have successfully sparked the scientific interest of the nation's high school students, particularly African Americans, Hispanics, Native Americans, and young women. Additionally, participation in our annual International Science and Engineering Fair has increased from 7 to nearly 40 nations.

It was gratifying to find just how many parents, teachers, and scientists share our determination and enthusiasm, and how many spend long hours working in an intriguing variety of programs with youngsters of all ages.

Too often, such dedication goes unrecognized by the public and by the scientific community. We at Science Service feel that the great effort of scientists them-

selves to improve the science literacy of children deserves its own honor.

And so, on Nov. 16, a distinguished audience will gather at the Explorers Club in New York City to witness a significant event in our organization's 73-year history.

That evening, we will present the first annual Science Service/SCIENCE NEWS Award for Contributions to Science, Youth, and Exploration to marine geologist and geophysicist Robert D. Ballard of Woods Hole Oceanographic Institution for his outstanding and unselfish devotion to assisting students in furthering their understanding of science and its importance to society and the world's well-being.

At the same gala affair, the Explorers Club will present its Award for Exploration in Science to Glenn T. Seaborg,



Robert D. Ballard



Glenn T. Seaborg

Nobel laureate, distinguished chemist, science literacy advocate, and chairman of the Science Service Board of Trustees.

Science and education in general owe much to both of these men, whose research contributions have significantly advanced their disciplines and whose

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Stereo views of a volcano on Io called Ra Patera, some 500 km in diameter, show that its tallest parts have a surprisingly low elevation — only about 3 km. (Other mountainous areas on this moon run as tall as 10 km.) According to Schenk, the shallowness of the slopes suggests that the lava that built Ra Patera and its surroundings, which extend for about 250 km around the volcano, must have been rather runny. A thicker lava couldn't have traveled as far over this relatively flat region.

The finding may shed new light on the chemical composition of Ra Patera's lava as well — whether it consists primarily of basalts or contains a high concentration of sulfur compounds.

In 1979, both Voyager 1 and Voyager 2 photographed Ganymede. From these pictures, Schenk and his team have constructed stereo pairs that cover about 8 percent of this moon's surface. The images show in sharp relief the depth of craters; grooves; flat, circular features known as palimpsests; and the large basin Gilgamesh. The stereo pictures reveal that a highly fluid material once puddled between the basin's ridges, filling in and smoothing over the older terrain.

Although the Voyager 1 images of Callisto have poor resolution, stereo pairs reveal new details about a huge complex

called Valhalla. Scientists already knew that the roughly circular structure, which contains a large set of concentric rings and ridges, has a diameter of 3,500 km. The stereo coverage shows that throughout a small section at the center of Valhalla — a region measuring about 400 km across — a once viscous material blankets its ridges and mountains.

Schenk speculates that when a large body slammed into Callisto sometime in the distant past, it blasted loose and melted material from the floor of Valhalla. The molten material then splashed onto the ridges and mountains before solidifying.

Titania, photographed by Voyager 2 in 1986, has significantly fewer craters than other moons of Uranus. Scientists had previously suggested that this moon underwent some kind of upheaval — a geologic face-lift that wiped its surface clean of other craters. The stereo images may shed light on the nature of the upheaval.


The pictures reveal a buckled landscape known to occur when a planetary body compresses or shrinks. Schenk suggests that Titania has shriveled like a dried-up apple, causing its surface to crinkle and buckle. This would explain both the rolling topography and the low density of craters.

**S**chenk says he'll have plenty to do, even after he exhausts the supply of stereo pairs provided by Voyager.

For instance, in reexamining stereo images of Mercury taken by Mariner 10, Schenk plans to compare the pictures with stereo pictures of Earth's moon recorded earlier this year by the Clementine spacecraft. Schenk will attempt to determine if the bright streaks of material seen radiating out from craters on both the moon and Mercury were created by similar processes.

In addition, Timothy J. Parker of the University of Southern California in Los Angeles has independently begun generating three-dimensional perspectives of Mars. He bases his work on images taken by the two Viking spacecraft, which photographed the Red Planet from orbit for 5 years, beginning in 1976. Parker hopes to find new evidence of ancient lake beds on Mars.

Future planetary missions, Schenk notes, could easily and cheaply incorporate stereo photo sessions. But even single sets of new images have a hidden value, he says. By carefully matching fresh images of a planetary body with those taken during older missions, scientists can literally add a new dimension to our understanding of the solar system. □

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work with students has greatly expanded the scientific horizons of thousands.

Many people remember Robert Ballard as the man who discovered the sunken remains of the *Titanic* and the German battleship *Bismarck* and who surveyed the final resting place of the torpedoed liner *Lusitania*.

Others recall his scientific feats, including participating in the first manned exploration of the Mid-Atlantic Ridge, part of the submerged mountain chain that winds through Earth's oceans like the seams of a baseball, and the discovery of the Galápagos Rift hot water vents and the unusual sea creatures living around them. Pictures from these expeditions rank among the most dramatic works of undersea photography.

Remarkable as these achievements are, Science Service and SCIENCE NEWS honor Ballard for his equally remarkable efforts to capture the imaginations of children, particularly through his Jason Project.

Each year, he organizes a deep-sea expedition — utilizing the remote-controlled research submarine *Jason* — and periodically telecasts live reports to some 400,000 schoolchildren age 10 to 15 in the United States, Canada, England, and Bermuda. Ballard narrates the expedition's activities, and participating scientists provide commentary. The result

is real scientists doing real science brought to life.

*Jason* voyages have included visits to hydrothermal vents in the Mediterranean Sea and to the perfectly preserved remains of two War of 1812 warships resting on the floor of Lake Ontario. Next year, *Jason* will venture to the ocean floor off Hawaii to investigate an active undersea volcano.

Of Glenn Seaborg, CHEMICAL & ENGINEERING NEWS once said that his name "immediately brings to mind nuclear chemistry." He won the Nobel Prize for Chemistry in 1951 for his pioneering studies of transuranium elements.

A past chairman of the former Atomic Energy Commission and a leader long active in efforts to improve science education, Glenn Seaborg has provided Science Service his knowledgeable guidance for more than 25 years as a member of our Board of Trustees. He well deserves the Explorers Club award for both his scholarly and his educational accomplishments.

I hope you will join me in saluting Robert Ballard, Glenn Seaborg, and the other scientists who work so hard to open the eyes of the world's youth to science. And if you wish to nominate someone for our 1995 award, please write to me. You, too, can help promote a better understanding of science among our children, our future leaders.

— Alfred Scott McLaren