

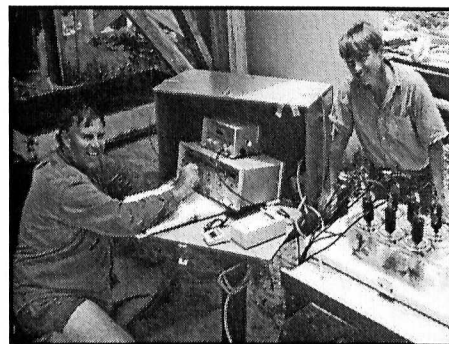
This composite image of the "Black Widow" pulsar uses red/white to show the distribution of the bright/faint X-ray emission regions, and green/blue for the bright/faint optical emission regions.

A "Black Widow" Twirls in Space

A team of astronomers has discovered an ancient, fast-spinning star that is ejecting particles that move at almost the speed of light. This discovery provides the first evidence for dramatic winds in a very old pulsar (a spinning neutron star).

Known as "The Black Widow," this small, very dense pulsar rotates about 600 times a second—a phenomenon that only seems to occur in pulsars billions of years old. The Black Widow is 50 percent more massive than our own Sun, but has a diameter of only about 12 miles.

The team, which includes Bryan Gaensler of the Center of Astrophysics, used the Chandra X-ray Observatory for their research. Though considered to be exotic, pulsars may have played an important role in determining the Earth's composition. Many elements on Earth were synthesized in normal stars, but the origins of heavy elements like gold, platinum, and uranium remain somewhat puzzling. Scientists have calculated that these and other heavy elements could have been made in the extreme conditions that involve neutron stars. These new results will help astronomers better understand these extreme conditions



Mark and Diane Littler performing functional morphology studies of tropical coral-reef algae in Belize.

South Pacific Seaweeds Get Top Billing

Thanks to a new guidebook, identifying seaweeds in the South Pacific is a lot easier for sport divers and marine scientists who venture into the undersea realm of South Pacific reefs.

Written by Diane and Mark Littler of the Department of Systematic Biology – Botany, *South Pacific Reef Plants* features stunning photographs taken during more than 2,200 SCUBA dives throughout Tahiti, Cook Islands, Samoa, Fiji, Solomon Islands, Papua New Guinea, and the Great Barrier Reef.

The book showcases more than 370 photographs of the major species of seaweeds, and provides information on their physical features, habitat, and distributions, along with notes of interest. Over 70 additional images depict "ecological phenomena" in photographic sidebars. The photographs allow readers to initially "picture-key" specimens, and then to positively identify them by using other reader-friendly keys and detailed descriptions. Diane and Mark Littler have also written *Caribbean Reef Plants*. This guidebook identifies approximately 565 marine algae and sea grasses of the Caribbean Region.



Saccharum spontaneum.

Students' Thesis Guides Tree Planting along the Panama Canal

Norma Cedeño, Riviet Deleon, and Nurys Palacios have recently been awarded their "Licenciaturas" in biology from the University of Panama (equivalent to a U.S. bachelor of science degree). All three completed their thesis research with the Native Species Reforestation Project (PRORENA), a collaborative project led by the Smithsonian Tropical Research Institute and the Yale School of Forestry and Environmental Studies. PRORENA focuses on developing strategies for restoring native tree cover to degraded neotropical landscapes.

Cedeño and Deleon evaluated the performance of seven tree species used by the Panama Canal Authority (ACP) to stabilize erosive slopes along the Panama Canal corridor occupied by the invasive exotic grass species *Saccharum spontaneum*. Palacios studied the composition of the soil seed bank in the extensive *S. spontaneum* grasslands in Panama's Camino de Cruces National Park.

The three researchers' results are already being used to improve management in the region. The ACP has modified its planting strategies to focus on the tree species identified by Cedeño and Riviet as most promising, and is seeking ways to increase the use of its plantings by mammals, birds, and other seed dispersers to compensate for the limited *in situ* seed sources described by Nurys.

Recent Publications

Viney, M. 2003. *Ireland*. Smithsonian Books.

Goulding, M.; Barthem, R.; Ferreira, E. 2003. *The Smithsonian Atlas of the Amazon*. Smithsonian Books.

Neitzel, J. 2003. *Pueblo Bonito*. Smithsonian Books.

Vane-Wright, D. 2003. *Butterflies*. Smithsonian Books.

Brooks, S. 2003. *Dragonflies*. Smithsonian Books.

Thompson, M. 2003. *At the Edge of Space*. Smithsonian Books.

Littler, D.; Littler, M. 2003. *South Pacific Reef Plants: A Divers' Guide to the Plant Life of South Pacific Coral Reefs*. Offshore Graphics.

Littler, D.; Little, M. 2003. *Caribbean Reef Plants: and Identification Guide to the Reef Plants of the Caribbean, Bahamas, Florida and Gulf of Mexico*. Offshore Graphics.

Smith, G.; Steenkamp, Y.; Klopper, R.; Siebert, S.; Arnold, T. "The Price of Collecting: Overcoming the challenges involved in computerizing herbarium specimens". *Nature* 2003 March 27; 422.

Gaensler, B.; Stappers, B; Kaspi, V.; van der Kils, M.; Lewin, W. "An X-ray Nebula Associated with the Millisecond Pulsar B1957+20". *Science* 2003 February 28; 299: 1372-1374.

Spotlight on Science at the Smithsonian

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