

SEND TO A FRIEND **Australia Hops On Gamma Ray Project**By [Stewart Taggart](#)Special to [SPACE.com](#)
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SYDNEY, Australia -- Looking a bit like a magnified fly's eye, a 32-foot (10-meter) gamma-ray telescope in Australia's Outback is the first of four that will give astronomers stereoscopic views of the epic violence involved in the life and death of stars.

"The things we are interested in are strange and unusual: pulsars, supernovas and [black holes](#)," physicist and project coordinator Dr. John Patterson told [SPACE.com](#) Tuesday. "It's these that give out gamma rays."

"The light collection all has to be done under very dark conditions, with no moon, just starlight and no cities around. Even at Woomera, that happens only about two weeks a month."

Thus far, gamma-ray astronomy has taken place largely from either space or the Northern Hemisphere. The new telescope project, officially opened Tuesday, will give astronomers a better view of what's happening in the universe seen from the Southern Hemisphere. As such, astronomers working with the new telescope will be a bit like the explorers and mapmakers of Earth's South Seas in the 18th century.

[Gamma rays](#) are often associated with the magnetic fields around black holes, which are inescapable vacuum pits of obliteration caused by collapsing stars. Gamma rays can reveal clues about black holes' characteristics and histories.

[Pulsars](#) and supernovas also arise from the fitful death throes of stars, and also emit gamma rays. Studying these rays can allow astronomers to perform a kind of astronomical geriatric research and autopsies on aging and deceased stars -- as well as derive clues as to how galaxies and stars are born.

Shooting through space, gamma rays create a cascade of particles when they hit Earth's atmosphere, resulting in a pool of blue light highly sensitive detectors can pick up.

"We'll pick up these faint light flashes from the sky, and then focus these onto imaging cameras and convert them into electronic pictures we can manipulate on computers," Patterson said.

As it happens, the astronomers couldn't ask for a better place to put their gamma ray telescopes than Woomera, an underutilized Australian government rocket testing range roughly the size of England. Located about 500 kilometers north of Adelaide in South Australia's empty Outback, Woomera's isolation makes it ideal for such a telescope, Patterson said.

"The light collection all has to be done under very dark conditions, with no moon, just starlight and no cities around," Patterson said. "Even at Woomera, that happens only about two weeks a month."

Among other things, the telescope will provide astronomers a better idea how supernovas develop over their lifetimes, and to further investigate freaky gamma ray emitters called blazars, mysterious and little understood offshoots also believed to be related black holes.

"Blazars are very unusual things, and were trying to find some in the Southern Hemisphere," Patterson said. "It's a relatively unexplored area."

A smaller, 12-foot (3.8-meter) gamma ray telescope had been operating at Woomera previously, but has now been mothballed. An upgrade to the \$2.4 million 32-foot (10-meter) telescope now operating is the first step in a project jointly funded by several Australian and Japanese educational institutes.

The aim is to build three additional telescopes in Woomera with the total ensemble operational in 2004 providing deeper stereoscopic views of gamma rays. The second of the four telescopes is currently being built in Japan and is expected to be installed in Woomera in 2002.

Among other things, the new telescope complex will provide scientists more constant access to gamma ray data in the southern sky, and provide Ph.D. students with a chance to participate in leading edge science, Patterson said.

To date, most leading-edge research in gamma ray astronomy has come through the space-based [Compton Gamma Ray Observatory](#) satellite, and through such ground-based endeavors as the [Whipple Observatory](#) in southern Arizona, Patterson said.



The CANGAROO II telescope will study the explosive deaths of stars, and other cosmic sources of gamma rays.

The Australian effort is primarily being conducted by the Department of Physics and Mathematical Physics of the University of Adelaide, and the Institute for Cosmic Ray Research of the University of Tokyo. The currently operating telescope has been dubbed [CANGAROO-II](#), with CANGAROO-III to represent the other three to be built.

The name "CANGAROO" is a play on words, sounding much like the name of the common Outback animal "kangaroo." But CANGAROO is really an abbreviation of the somewhat verbose "Collaboration between Australia and Nippon for a Gamma Ray Observatory in the Outback."

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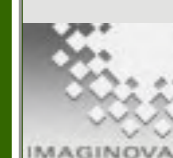


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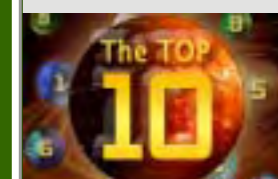


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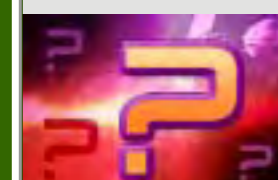
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