

# Australian lasers to track orbiting junk

Stuart Gary, ABC, Thursday, 1 April 2010

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## QUOTE

Australian scientists are trialling a new system that uses laser technology to track space junk orbiting the Earth.

Earth orbiting debris poses a major threat to satellites and astronauts. Recently, both the International Space Station and the space shuttle were forced to manoeuvre out of the way of space junk that almost came too close for comfort.

To better track the orbiting debris, Canberra-based EOS Space Systems is developing a new laser tracking system.

Chief Executive Craig Smith says the new technology uses infrared lasers to target and track orbital debris, something not done before.

"We do satellite laser ranging for Geoscience Australia from facilities both here at Mount Stromlo [near Canberra] and at Yarragadee in Western Australia," he says.

"But satellites carry retro-reflectors allowing accuracy down to a millimetre. The challenge here has been extending that ability to track space debris which doesn't have reflectors.

"We are now able to locate these objects to about a metre in range space and get very precise orbits."

The debris orbiting the Earth ranges from disused satellites and rocket boosters as big as a bus, down to solid fuel slag and paint flakes just a few millimetres across. In 1983, a tiny fleck of paint left a crater in the windscreen of the space shuttle Challenger.

Of the estimated 600,000 pieces of space junk bigger than 1 centimetre, only 19,000 can be tracked with existing radar based technology.

Current tracking systems are limited to objects greater than 5 centimetres in size in low Earth orbit or 50 centimetres in geosynchronous orbits - approximately 36,000 kilometres above the Earth's surface.

## **Advance warning**

Smith says, depending on the object's orbital stability, knowing where it will be in as little as 36 hours time provides enough notice to manoeuvre satellites out of the way.

"Currently the US Defence System NORAD tracks a lot of debris with radar. But radar won't always give you sufficient accuracy to prevent a collision," he says.

"Last year an operational Iridium communications satellite and a spent Russian Kosmos rocket body collided destroying the satellite and generating a new debris cloud.

"Both were being tracked by radar, but there wasn't enough accuracy to predict that they would collide.

"A laser tracking system may have been able to prevent the collision by allowing controllers to manoeuvre the satellite out of the way."

Smith says there are specific orbits containing 'high value assets' including the space shuttle and the International Space Station, as well as surveillance and communications satellites.

"We use a suite of acquisition systems (mainly cameras) to detect the target, then point a laser at the object and get an orbit determination," he says.

"To the best of my knowledge no other country or organisation in the world can do that with as much precision."