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Curtin University plays important role in worldwide cosmic event

Researchers from Curtin University have joined forces with astronomers from around the world in a major project to capture radiation bursts, following the rare merger of two neutron stars.

The merger was discovered on August 17 this year by gravitational wave detectors in the US-based Laser Interferometer Gravitational-Wave Observatory (LIGO) and the Italy-based Virgo detector, with Curtin's Desert Fireball Network and the Murchison Widefield Array (MWA) radio telescope joining a global effort to record the bursts.

The Desert Fireball Network, led by Curtin University's Professor Phil Bland, was the only facility of its kind on Earth to be looking in the right direction at the exact time of the neutron stars colliding.

"Colleagues from around 70 ground and space-based observatories – more than 3000 astronomers – worked together to point every possible telescope they had in the direction of the neutron star merger hoping to capture the bursts of radiation. It's great that the Desert Fireball Network was able to assist with that effort, and provide data as-it-happened," Professor Bland said.

"The Desert Fireball Network cameras that we have set up across Australia observe the whole sky, all night every night and in this case we got really lucky with one of our cameras in Western Australia in the right spot at the right time when the neutron stars went bang."

"It was tremendously exciting to be part of something like this, and that our facility – designed for planetary science – was able to contribute to such an important event," Professor Bland said.

A neutron star is formed when massive stars explode in supernovas. They are the smallest, densest stars known to exist with one teaspoon of neutron star material weighing more than a billion tonnes.

Also part of the search was the Murchison Widefield Array (MWA) radio telescope international consortium, led by MWA Director and Curtin University Associate Professor, Randall Wayth.

"Once we received notification of the event, the widefield nature of the MWA allowed us to search for radio bursts associated with the gravitational waves over a large area of sky, which meant we could join the rest of the world in being a part of this exciting cosmic event," Associate Professor Wayth said.

"It also presented a great opportunity for us to use the MWA to test the methods of observations that we will use with the more powerful Square Kilometre Array, part of which will also be based in Western Australia."

This discovery marks the first time scientists have been able to detect both gravitational waves (ripples in space and time) and light from the collision of two neutron stars at the same time, with the results announced overnight in the US and published in the journal [*Physical Review Letters*](#).

"The data that were collected and captured is incredibly exciting in terms of our understanding of how the universe ticks and for Curtin researchers to be able to play a part in this reflects the high value of our planetary science and radio astronomy work," Professor Bland said.

A dropbox link featuring video features and still images relating to the cosmic event are available [here](#).

A joint media release by LIGO and Virgo is also available online [here](#).

A caption sheet is also available in the dropbox folder.

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Notes to Editor:

About the Desert Fireballs Network

The Desert Fireballs Network (DFN) consists of over 15 team members from a range of disciplines including science, engineering, mathematics and technology. Utilising special cameras positioned in strategic locations throughout regional and remote Australia, the DFN team tracks meteorites as they enter Earth's atmosphere, with the aim of uncovering them on the ground to get a better understanding of their composition and path trajectories.

Fireballs in the Sky is the award-winning outreach and citizen science program that connects the public with the research of the DFN. Global citizens are encouraged to get involved in the research by reporting fireball sightings through the Fireballs in the Sky app, available through app stores on mobile devices.

Professor Phil Bland is from the Department of Applied Geology, Curtin WA School of Mines, Faculty of Science and Engineering at Curtin University in Perth, Western Australia.

About the Murchison Widefield Array

The Murchison Widefield Array (MWA) is a low-frequency radio telescope operating between 80 and 300 MHz. It is responsible for performing large surveys of the entire Southern Hemisphere sky and acquiring deep observations on targeted regions.

It is located at the Murchison Radio-astronomy Observatory (MRO) in Western Australia, the planned site of the future [Square Kilometre Array](#) (SKA) telescope, and is one of three telescopes designated as a Precursor for the SKA.

The MWA has been developed by an international collaboration, including partners from Australia, Canada, India, New Zealand, Japan, China and the United States.

For more information visit the [MWA website](#)

About Curtin University

Curtin University is Western Australia's largest university, with more than 58,000 students. Of these, over 15,000 are international students. The University's main campus is in Bentley near the Perth CBD. Curtin has five other campuses across WA, Malaysia and Singapore, with a new campus opening in Dubai in 2018. Curtin also has presence at a number of other global locations.

Curtin is celebrating '50 Years of Innovation' in 2017 – the combined history of the Western Australian Institute of Technology (WAIT), which opened its doors to students in 1967 and Curtin University, which opened in 1987.



Today, Curtin is estimated to be ranked 180th and in the top one per cent of universities worldwide, and 9th in Australia in the highly regarded [Academic Ranking of World Universities 2017 \(ARWU\)](#), and features highly in a number of other key world rankings.

The University has built a reputation around innovation and an entrepreneurial spirit, being at the forefront of many high-profile research projects in astronomy, biosciences, economics, mining and information technology. It is also recognised globally for its strong connections with industry, and for its commitment to preparing students for jobs of the future.

For further information visit curtin.edu.au.

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