

Scientists aim to unlock gravitational wave mysteries

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Scientists at The Australian National University today joined a consortium of universities launching plans for a new observatory to detect a space phenomenon that has challenged physicists since it was first proposed by Einstein – gravitational waves.

The Australian gravitational wave observatory would create the biggest vacuum here on Earth in order to detect gravitational waves. It will use a pair of perpendicular five kilometre long stainless steel pipes through which interfering powerful laser beams would detect passing waves.

The Australian Consortium for Interferometric Gravitational Astronomy is led by physicists at ANU, UWA and the University of Adelaide, with support from researchers at a number of other universities and high technology companies.

“We know that gravitational waves produced from cataclysmic astrophysical events, such as supernovae, and inspiralling pairs of neutron stars to form black holes, are immensely powerful. We know that they play a significant role in the physics of the universe. But we have not been able to yet successfully detect and measure them. The proposal for a gravitational wave observatory here in Australia would be a boon for our knowledge of these waves, and their role in space,” said Associate Professor Susan Scott, from the Physics Department at ANU.

Gravitational waves are thought to be tiny ripples in the fabric of space, created by matter moving through space. They cause everything,

including space itself, to alternately stretch and shrink in different directions, but only by an infinitesimal amount. The detection of gravitational waves would herald a second known form of radiation (along with electromagnetic radiation).

Australia is the optimal location for an addition to the world array of gravitational wave detection facilities, as it would more than double the number of detectable sources and improve by up to four times the directional precision of the global network of detectors, according to Associate Professor Scott.

Last week Australian Research Council Discovery grants and funds from the WA Government and LotteryWest, totalling more than \$2 million, were awarded to ANU, UWA and the Gravity Discovery Centre to bring the gravitational wave observatory one step closer in Australia.

“Importantly, this funding will also allow Australian scientists to continue to participate in the world gravitational wave astronomy program,” Associate Professor Scott said. “The aim of the prospectus is to map out the consortium’s plan to secure further funding to build this important international facility in Australia.”

Source: Australian National University

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