

## Stawell to join the search for the missing 85 per cent of our galaxy

Victorian government supports plans to build a dark matter laboratory deep in Stawell Gold Mine.

The Victorian government has committed \$1.75 million to help Australian scientists hunt for dark matter a kilometre underground in the Stawell gold mine in regional Victoria. The project will commence once the Federal government provides matching support from their regional development program.

The funding will enable physicists to create the Stawell Underground Physics Laboratory and construct a dark matter particle detector paired with a matching detector under an Italian mountain.

“In 1970 Canberra astronomer Ken Freeman ‘weighed’ a spiral galaxy and found that there wasn’t enough matter to provide enough gravity to hold the galaxy together. He realised that something was missing. Now we believe that 85 per cent of the mass in the galaxy is dark matter. We’re surrounded by this dark matter. But we can’t detect it. And we’ve been trying for 40 years,” says Geoff Taylor, director of the ARC Centre of Excellence for Particle Physics. “It’s invisible to us – it passes through us and the planet untouched.”

Researchers at the national physics congress in Canberra this week discussed the new plans to find this missing dark matter.

“We hope to begin testing in 2015,” says project leader Elisabetta Barberio. “We and our Italian colleagues will create two experiments – one deep in the Stawell Gold Mine, the other under the Italian mountains at Gran Sasso.”

The Italian researchers think they may have already detected dark matter particles. To confirm their discovery the teams plan to run two identical experiments – one at Gran Sasso, one at Stawell. They will measure the annual fluctuation in levels of the new substance that is potentially dark matter. Similar variations in both hemispheres at the same time of year could confirm their theory that annual fluctuation is caused by the Earth moving ‘upstream’ against the galaxy’s dark matter in June, while in December we move ‘with the flow’. However, if results from the tests show variations between the two hemispheres, the fluctuation could be attributed to terrestrial influences.

The Northern Grampians Shire Council has calculated that over ten years the laboratory will generate \$265 million in economic benefit at a challenging time for the region.

If the experiments are successful, the Victorian goldfields could once more hear the cry ‘Eureka!’

The Stawell Underground Physics Laboratory is a partnership between government, education and industry that can deliver significant investment, economic, employment and research outcomes across the region.

The partners include the ARC Centre of Excellence for Particle Physics at the Terascale, (CoEPP), the Italian National Institute for Nuclear Physics (INFN), Crocodile Gold, (CG), the Northern Grampians Shire Council and other major Australian and international organisations. The proposed laboratory will host the first underground dark matter detection laboratory in the southern hemisphere and form part of a network of major research laboratories across the globe.

### For interview:

Professor Geoff Taylor, CoEPP

Professor Elisabetta Barberio, CoEPP

Mayor Murray Emerson, the Northern Grampians Shire Council, via Communications Officer, Jessie Newton on 03 5358 0517.

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