

Green light for revolutionary new science curriculum

July 1 2014, by David Stacey



A revolutionary new science curriculum that aims to teach all school students about science starting with Einstein's discoveries a century ago has received \$400,000 in Federal Government funding.

Project leader Winthrop Professor David Blair, Director of the Australian International Gravitational Research Centre and co-founder of the Gravity Discovery Centre in Gingin, said the program would be called Einstein-First.

"Whether you are from a remote school in an indigenous community or an elite private school, you deserve to be taught our best understanding of the workings of the universe - not the obsolete 300-year-old science

that fills most of the physics curriculum today," Professor Blair said.

"Everyone deserves the opportunity to learn about the concepts that underpin all of modern technology. Einstein is inside our phones because we all use Einsteinian physics every day. We have the right to have it explained to us at school."

The Graham (Polly) Farmer Foundation and three WA universities: UWA, Curtin and Murdoch, were awarded \$400,000 in Australian Research Council funding. Additional funding included more than \$1 million in contributions from the partner organisations, and a major contribution by the US Airforce Academy in Colorado of a new robotic telescope, valued at \$460,000.

"People used to say that it was too difficult to teach science in schools," Professor Blair said. "We have already proved that kids as young as 11 understand Einsteinian ideas with ease. To them it is neither scary nor complicated.

"Yet if, like most adults, you were taught the old concepts of space, time, gravity and matter, the new ideas seem weird and difficult. Even though they revolutionised the modern world, the new concepts seem to have been kept as a closely guarded secret except for the few who take advanced university physics."

Professor Blair said through pilot studies, the researchers had developed a set of hands-on classroom activities to help students find it easier to learn new ideas and make all the new concepts seem real and familiar.

"This funding allows us to roll out these activities, maximise their effectiveness and make them more widely available.

"It needed the genius of Einstein to discover the new reality but you

don't have to be a genius to understand it. Children love it because it is hands on and interactive. But they love it even more because they know they are learning something modern."

Professor Blair said one of the biggest problems was very few teachers had ever learnt the new Einsteinian concepts.

"Our team has developed intensive professional development programs for retraining teachers. Trials have shown that almost all teachers, once exposed to the classroom materials, see how easy it is and how motivating it is for students."

The research project is led by a team that includes Professor Blair, Winthrop Professor Grady Venville, Adjunct Associate Professor Marjan Zadnik and Professor Nancy Longnecker, all from UWA.

At Curtin University, Professor David Treagust brings expertise on conceptual change, and at Edith Cowan University Professor Gary Partington brings expertise on indigenous education.

WA high schools and their award-winning teachers participating in the research program include Shenton College (Warwick Matthews), Mt Lawley Senior High School (Richard Meagher) and Rossmoyne Senior High School (Darren Hamley).

The United States Air Force Academy is contributing a fully automatic half meter sized telescope to the project. The telescope, which is one of a worldwide network of 13 Falcon telescopes currently being installed, will be located near the Gravity Discovery Centre.

The new telescope will allow students in the US to look at objects in the skies over Perth during their daytime, while WA students will be able to look at night skies over Colorado during our daytime. The team plans to

use the new telescope to allow students to observe star systems where the warping of space and time and exotic quantum processes show up strongly.

Provided by University of Western Australia

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