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Studying the dark side of the Universe

Posted on Tuesday 14th September 2010

Birmingham physicists are using a revolutionary new instrument that is providing them with a radically new view of the cosmos. By harnessing gravitational waves, the researchers could see the universe by mapping the vibrations of space-time rather than by using the light from stars and galaxies. This new way of exploring the cosmos opens up the exciting prospect of new discoveries.

Dr Andreas Freise, from the University of Birmingham's School of Physics and Astronomy, says, 'Gravitational waves are everywhere! Everything that moves creates a gravitational wave. We can't see them, or feel their effect because they are so weak. But we have now built exquisitely sophisticated instruments that will allow us to detect this radiation emitted by some of the most violent events in the universe, such as colliding black holes or the Big Bang.'

To observe these 'ripples in space and time' the Birmingham team are contributing components to the most sensitive gravitational wave observatory in the world: Advanced LIGO. The construction of these three kilometre-sized instruments in the USA, that will upgrade the existing detectors, is driven by a large international collaboration and will start in the autumn.

Dr Alberto Vecchio, also from the University of Birmingham's School of Physics and Astronomy, says, 'Advanced LIGO is a revolutionary instrument that will provide us with a radically new view of the cosmos... There are bound to be exciting surprises!'

The media were introduced to this new area of work at the British Science Festival on the 14th September 2010.

Gravitational waves press release (/news/latest/2010/09/14sept-gravitation.aspx) .

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