

Gravitational waves and black holes - seeing the 'unseeable'

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Birmingham physicists are using a completely new type of large-scale instrument to capture gravitational waves and study the dark side of the universe.

To observe these 'ripples in space and time' they 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 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.'

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, by mapping the vibrations of space-time rather than the light from stars and galaxies. There are bound to be exciting surprises!'

The direct detection of gravitational waves will also be the experimental validation of one of the fundamental predictions of Einstein's Theory of General Relativity.

Further information:

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[Gravitational Wave Group Birmingham \(http://www.sr.bham.ac.uk/gwgroup/bsf2010/press_info/\)](http://www.sr.bham.ac.uk/gwgroup/bsf2010/press_info/)

[Gravitational waves research story \(/research/our/news/items/Gravitationalwaves.aspx\)](http://www.sr.bham.ac.uk/research/our/news/items/Gravitationalwaves.aspx)