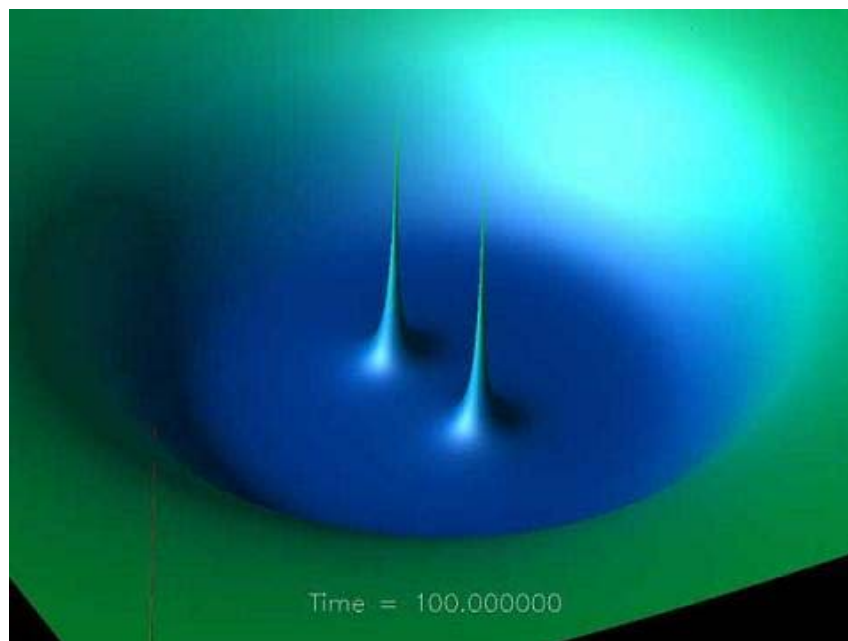


Image of the Week

Computer Model of Colliding Black Holes



(Credit: Yosef Zlochower)

Scientists from the University of Texas at Brownsville (M. Campanelli, C. Lousto, and Y. Zlochower) and from Florida Atlantic University (P. Marronetti) recently developed a computer simulation of orbiting binary black holes. Shown here is a still taken from a 3D computer simulation (January-February, 2006). Based on Einstein's equations for general relativity, these are the first accurate simulations of gravitational waveforms from orbiting binary black holes. The entire collision and subsequent creation of a single, larger, black hole occurred in less than 1 second. Results were published in the *Physical Review Letters* (vol. 96, 111101, 2006) and *Physical Review D (Rapid Communications)*, vol. D73, 061501, 2006).

A star with more than 20 to 25 solar masses ends its life with a violent explosion. After exhausting the nuclear fuel at its core, the massive star explodes, becoming more than a million times brighter than the whole hosting galaxy. The massive stellar core collapses into a black hole, where the force of gravity is so strong that matter and light cannot escape from the surrounding area, or event horizon. Binary stars are thought to develop into binary black holes in some cases of stellar evolution and may be the main source of gravitational radiation, creating space-time ripples.

The instruments now available to science make it possible to detect black holes in space; however, gravitational waves are not yet detectable. This new research may help observatories, such as LIGO (Laser Interferometer Gravitational-Wave Observatory), correctly detect gravitational waves.

View the black hole merger simulation at the American Institute of Physics website [here](#). Windows Media Player, Real Player, QuickTime, or equivalent required.

For Further Study

Articles: » [Black hole](#) | [Gravitational collapse](#) | [Gravitational radiation \(2001 Research Update\)](#) | [Relativity](#)

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Related Web Sites: » [Physics news Update 771](#) | [LIGO Laboratory Home Page](#)



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