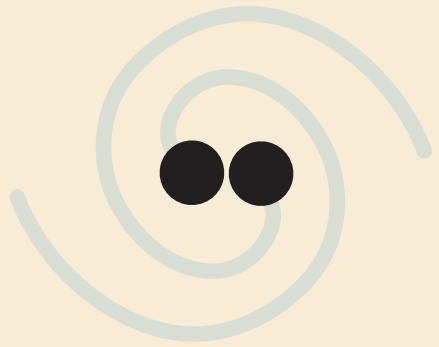
2017 NOBEL PRIZE IN PHYSICS

The Nobel Prize in Physics 2017 was awarded to Rainer Weiss, Barry C. Barish, and Kip S. Thorne for decisive contributions to the LIGO detector and observations of gravitational waves.

When any mass accelerates, gravitational waves are generated: ripples in space-time, much like the ripples when a stone is dropped in water. They were predicted by Einstein in 1916 but he thought they were too weak to ever be detected. However, in 2015, LIGO detected gravitational waves that were produced by two colliding black holes.

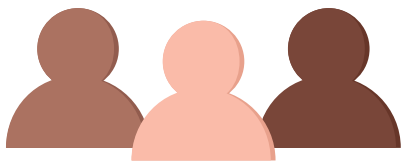


BLACK HOLE COLLISION

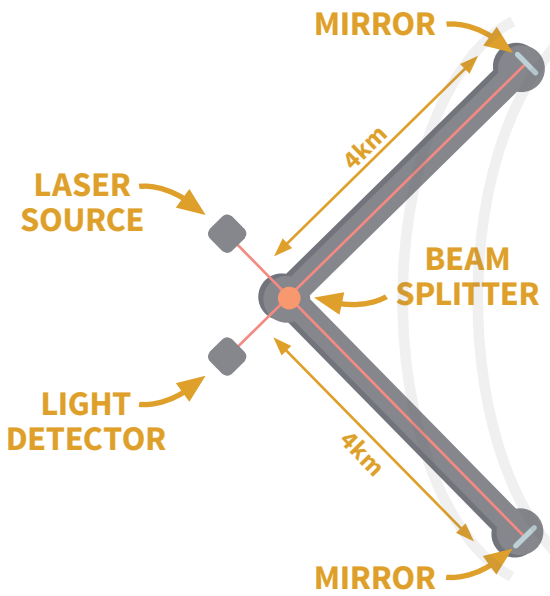
1.3 BILLION YEARS AGO

LIGO (LASER INTERFEROMETER GRAVITATIONAL-WAVE OBSERVATORY)

20 COUNTRIES



OVER 1000 RESEARCHERS



Light is used to measure changes in the length of the two arms of the instrument. They are the same length, so usually the returning light waves cancel each other out. Peaks and troughs of gravitational waves cause the arm lengths to change by tiny amounts; the light waves then travel slightly different distances, and some light passes through to the detector.

WHY DOES THIS RESEARCH MATTER?

Gravitational waves give scientists an entirely new way of observing violent events in space such as black hole collisions and supernovae, which may lead to further discoveries about the universe.

Nobel Prize in Physics Press release: https://www.nobelprize.org/nobel_prizes/physics/laureates/2017/press.html