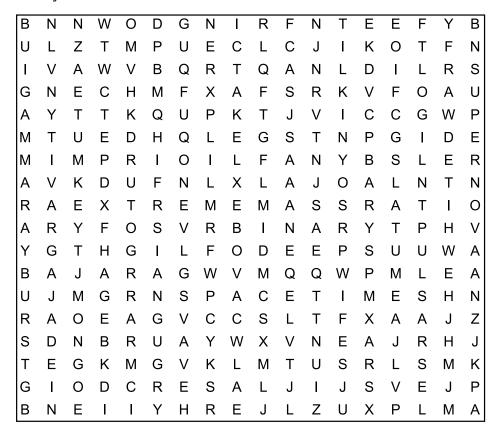
Gravitational Wave Astronomy

Can you find all the **bold** words?





Gravitational wave astronomy is a new means for observing the Universe. We hope to make many discoveries over the coming decade. To find out more, visit our website:

goo.gl/R5Puq

Gravity is the force that keeps us on the Earth, and the Earth orbitting the Sun. **Einstein** described gravity with his theory of **General Relativity**. This explains gravity in terms of the curvature of **space-time**.

Gravitational waves are tiny ripples in spacetime that travel at the **speed of light**. They are made by accelerating masses, for example **binary** systems which may include a **white dwarf**, **neutron star** or **black hole**. These **inspiral** as they orbit because gravitational waves carry away energy. Eventually the binary companions will collide, which may result in an explosion: a **gamma ray burst**.

One of the loudest sources is the **merger** of supermassive black holes found in the centre of galaxies. Following merger, the new black hole undergoes a **ringdown** period: it emits gravitational waves like a bell emits sound waves. Gravitational waves are also produced when a stellar mass black hole orbits a supermassive black hole, these are called **extreme-mass-ratio** inspirals.

We might even be able to detect gravitational waves from **supernova** explosions or echoes leftover from the **big bang**.

To detect gravitational waves we look for tiny distortions in spacetime. We can use a **laser** to measure differences in length in an **interferometer**, or look for deviations in the arrival of signals from **pulsars**. There are several ground-based interferometers being constructed including **LIGO** in America, **Virgo** in Europe and **KAGRA** in Japan. There is also an idea to put a giant interferometer in space. This is called **LISA**.

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