Gravitational waves (GWs) are distortions in the fabric of space and time, predicted by Einstein's General Theory of Relativity and confirmed on September 14, 2015, by the Laser Interferometer Gravitational-Wave Observatory (LIGO) at Caltech and the University of Washington. This network includes the Laser Interferometer Gravitational-Wave Observatory (LIGO) detector at Hanford, Washington, and the LIGO detector at Livingston, Louisiana, which travel at the speed of light. They are generated by rapid movements of massive objects, such as the merger of black holes and neutron stars, the explosion of supernovae and the Big Bang. For example, if two black holes merge, the gravitational waves carry away energy and angular momentum. This causes the black hole orbits to shrink, and the individual black holes to spiral closer together and form a single black hole, which is confirmed on September 14, 2015, by the Laser Interferometer Gravitational-Wave Observatory (LIGO).

**External Collaborations:**

- **The Ligo Scientific Collaboration (LSC)**[^3] A well-organized collaboration of approximately 760 scientists worldwide who have joined together in the search for gravitational waves from the most violent events in the universe, such as the merger of black holes and neutron stars, the explosion of supernovae and the Big Bang.

- **The LISA international Science Community (LISC)**[^12] eLISA/NGO is a planned ESA space-based gravitational wave observatory that would allow us to detect gravitational waves from massive black hole mergers in the centers of galaxies, from the ultra-compact binary systems in our own Galaxy and from many other sources. The purpose of LISC is to exchange information about LISA with the wider science community.

- **The LCGT and DECIGO collaborations**[^13] These are Japanese ground-based and space gravitational wave antenna projects.

- **The Ninja Project**[^14] The goal of the Numerical Injection Analysis (NINJA) project is to bring the numerical relativity and data analysis communities together to pursue projects of common interest in the areas of gravitational wave detection, astrophysics and astronomy.

[^3]: [http://ccrg.rit.edu/research/gravitational-waves](http://ccrg.rit.edu/research/gravitational-waves)
[^13]: [http://ccrg.rit.edu/GW150914](http://ccrg.rit.edu/GW150914)
[^14]: [http://ccrg.rit.edu/people/whelan](http://ccrg.rit.edu/people/whelan)