Gravitational waves (GWs) are distortions in the fabric of space and time, predicted by Einstein's General Theory of Relativity, which travel at the speed of light. They are generated by rapid movements of massive objects, such as black holes and neutron stars, or when very massive stars collapse to form neutron stars. By observing the gravitational waves, we will be able to directly observe events like black hole collisions that are hidden from our conventional electromagnetic-based (e.g., optical or radio) astronomy. In addition, if past experience with infrared, radio wave, and optical astronomy is any indication, there may be many surprising new discoveries waiting to be made. Scenarios that we have yet to imagine could be within the framework of modern theoretical physics.  

### 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)**[^11] 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**[^12] These are Japanese ground-based and space gravitational wave antenna projects.

- **The Ninja Project**[^13] 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]: The Ligo Scientific Collaboration (LSC) is an international collaboration of over 30 universities and 200 scientist, whose purpose is to detect gravitational waves and to understand their implications. The LSC operates the LIGO 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.

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