Gravitational Waves (GWs) which can in short be defined as a dynamical perturbation of spacetime curvature which propagate at the speed of light. The first direct detection of GWs was made by the two LIGO detectors observing signals generated by the merger of binary black Holes (BBHs) systems named after their observed date as GW150914, GW151226, GW170104, and GW170608. These detections of GWs has opened a new era of multimessenger astrophysics, where vast amount of data is expected to be delivered from the current observatories such as the advanced Laser Interferometer Gravitational-wave Observatory and the upcoming ones such as the Einstein Telescope (ET). The ET will revolutionize the field of GWs in every sense including and most importantly the better sensitivity of one order of magnitude that will provide, which will allow the detection at lower frequency. The ET -compared to second generation detectors- will have a wider accessible frequency band, that can be used to investigate a huge number of key issues related to astrophysics, fundamental physics and cosmology. The ET will have an annual detection rate for BBHs and BNSs of order $10^5 - 10^6$ and 7×10^4 respectively, which will make the manual inspection and analysis of the data very inefficient and time consuming. This motivates to develop an automated procedures to handle the preprocessing task such as detection and denoising. In gravitational waves.

Over the last few years different machine learning and deep learning techniques have been successfully applied to astronomical applications, on both images and spectral data. A good example is distinguishing between normal and peculiar optical galaxies by training an Artificial Neural Networks (ANNs)] and Estimation of the photometric redshift of galaxies using Artificial Neural Networks (ANNs).

Machine learning and deep learning techniques have been successfully applied to solve different problems in the field of GWs, for instance the use of machine learning in glitches identification. Our main goal in this study is to develop a robust and accurate deep learning models using convolutional neural networks and denoising autoencoder, that can automatically detect and minimize the associated noise of GWs sources, and return the general structure of the signal for parameter estimation. The outcome of this project will provide a fully automated software that is accurate and reliable at detecting and denoising GWs sources from data that has been generated specifically according to the ET's parameters, which will make it ready for handling the ET's real data once constructed and operated.