Gravitational Waves Code Report

**Motivation:**

The goal of the presented code is to examine gravitational wave event GW190521\_074359, a high confidence event detected by LIGO. To better understand this event, we will create clear charts showing the “strain” (the measure of strength of the gravitational wave) as well as a conversion of this data into a sound file comfortably in the range of human hearing.

**Methods:**

This goal will be accomplished in Python 3.10, using gwpy, a library designed to analyze the observations of LIGO. First, we will import the data by passing the timecode, along with a predetermined offset in the positive and negative, into the constructor of a gwpy TimeSeries object, thus fetching the data at and around the time of the observation. Plotting this data, we can see that there is significant electronic interference at the 60Hz range. To correct for this, we will create a bandpass filter from 50 – 250Hz, and then insert notches at 60Hz and its first two harmonics (120Hz and 180Hz).