Searching for the origin of magnetic fields in white dwarf stars

The majority of stars end their life as a white dwarf. These stellar remnants are burned out cores which are slowly releasing their internal heat. Due to their high gravity, the majority of stars have atmospheres that are hydrogen-rich or helium-rich. White dwarf atmospheres are open to direct investigations and show the effect of a unique range of physical phenomena. One of these is the presence of magnetic fields in a significant fraction of white dwarfs. The presence of a magnetic field is revealed by Zeeman splitted spectral lines. The origin of these magnetic fields remains an open question, although several theories have been proposed. The merger of two stars is the preferred origin based on current observations. One of these is that magnetic fields are observed more frequently in some spectral types compared to others. The European Southern Observatory (ESO) has been obtaining spectra for several decades and has amassed a large archive of data. You will extract spectra from the ESO archive with the aim of searching for magnetic fields and analyse them to determine their atmospheric parameters and measure their magnetic field strength. You will also explore any connection between the incidence and strength of magnetic fields and other white dwarf properties.