

Massive stars play a key role in astrophysics as the most important processes related to the chemical evolution of matter in galaxies take place in such stars. Their internal structure is still far from being well understood. One of the most promising techniques that may provide important insights into our understanding of the internal constitution of massive stars is called asteroseismology. In brief, asteroseismology is a technique which allows to “see” stellar interior by comparing observed and calculated frequencies of pulsations. This is a consequence of the fact that those frequencies depend on the internal constitution of a star. A simple analogy is hitting a glass with a spoon: an empty glass will sound different than a filled one. In the last years, asteroseismology gained an enormous observational support from space missions and wide-field photometric surveys. We propose two complementary approaches, namely seismic modeling of stars with rich frequency spectra and searches for variability due to pulsations in clusters and Galactic field. We will focus on β Cephei and SPB stars, but the project may bring interesting results also for other variable stars. This should allow us for a better understanding of stellar evolution and testing assumptions made when calculating models. The project can also have an influence on other branches of astrophysics like supernova research because massive stars explode as supernovae at the end of their lives.