Ensemble asteroseismology, clusters, and scaling laws

Josefina Montalban*[1]

[1]Free Lance (Free Lance) – Belgium

Abstract

The detection of radial and non-radial solar-like oscillations in thousands of G-K giants with CoRoT and Kepler has provided surprising results with a great and unexpected impact on other astrophysical domains. The available global seismic parameters allow, via scaling relations, largely model-independent determinations of stellar radii and masses, and can be used to estimate distances and ages of thousands of stars in different regions of the Galaxy . The ability of asteroseismology to characterize large populations of stars has called for a large scientific collaboration between expert researchers in galactic evolution, stellar structure , asteroseismology, stellar population synthesis, and spectroscopists. The collaboration between space seismic surveys and extensive ground-based spectroscopic surveys such as APOGEE, HERMES-GALAH and GESS is specially promising. That will allow the determination of precise age-metallicity and age-velocity relationships as well as information on metallicity gradients in the Galactic disc, all of them crucial ingredients for the study of the formation and evolution of the Galaxy. However, to successfully exploit all these data, a thorough knowledge of the uncertainties and systematic of the seismic determination of global stellar parameters is mandatory. In addition to the studies based on seismic analysis of theoretical stellar models and seismic analysis of independently characterized stars, the seismic study of stars belonging to open clusters can provide an particularly interesting test of the accuracy of seismically derived masses, radii, and ages

*Speaker