

**Jeudi 20 septembre 2018 à 11h30 (IAS, bâtiment 121, salle 1-2-3)**

**The formation and assembly history of our Galaxy: the Asteroseismology revolution in the Gaia era**

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In this talk I will summarise how can asteroseismology of red giants contribute to the challenging task of Galactic Archaeology, i.e. to reconstruct the past history of the Milky Way. Because most stars carry in their outer envelopes the chemical composition inherited at birth, it should be possible to map the star formation history in different parts of the Milky Way by measuring, for stars of different ages, a large array of chemical elements covering different nucleosynthetic sites. This goal seems to be still reachable even in the presence of radial stellar mixing, i.e. the fact that stars can move away from their birth places, losing most of their kinematical memory.

Key open questions in Galactic Archaeology will be summarised, with examples that clearly illustrate the need for precise ages for large samples of stars covering large portions of the Galaxy. It is now clear that dynamical and chemical information alone are not sufficient to address these questions. The discovery of solar oscillations in red giants made by CoRoT in 2009, brings the hope to finally be on the right track for obtaining crono-chemo-kinematical maps of our Galaxy and in this way, break degeneracies among models. Red giant luminosities together and large age-baseline make of them perfect galactic mappers to large distances complementing Gaia. The first steps taken in this direction by combining spectroscopic surveys such as APOGEE, RAVE, and Gaia-ESO with seismic information from Kepler, K2 and CoRoT will be summarised, as well as the current main caveats and difficulties. Finally, we will discuss the large impact that the PLATO mission could have in this field if enough giants down to at least  $V = 14$  are targeted.