

Ages of pre-main sequence stars with the surveys Gaia/ESO and Gaia

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Age and masses of pre-main sequence stars are traditionally derived from photometric data using multi-band color-magnitude diagrams and evolutionary models. However, ages derived with this method are affected by several empirical errors not easy to estimate (binary, extinction/reddening, photometric variability, on going accretion, presence of protostellar disks) and depend on the modeling of physical processes not fully understood (opacities, magnetic activity, convection, accretion etc.). High resolution spectroscopy and astrometry can be used to provide alternative observational probes to improve evolutionary models and better understand errors (e.g. Li abundance, rotation, stellar activity, stellar kinematics). In this talk I will discuss recent results and possible future achievements from the high resolution optical spectroscopic survey Gaia-ESO and the Gaia space mission. The former is providing homogeneous astrophysical parameters (e.g. effective temperatures, gravities, Li abundances) for a large sample of star clusters well sampling the full age range between 1 and 100 Myr, while the latter can lead a revolution in stellar astronomy with a catalogue of precise astrometric, photometric and spectroscopic data for more the one billion of Galactic stars.

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Session Classification: Pre-main sequence stars and the connection to the formation and early evolution of stars and planetary systems