

# Kinematic ages of moving groups - finally viable?

*Monday, September 18, 2017 5:21 PM (2 minutes)*

Current kinematic age techniques have been demonstrated to be unreliable despite being one of the best means to ascertain ages of young ensembles of stars. Three factors impact the success of traceback ages: (1) imprecise kinematic data introduce significant positional uncertainties when traced back millions of years, (2) incorporating errors in a classical way drives the convergence point to occur at younger ages if at all, and (3) age fitting hinges critically on a priori definitions of known members. Future Gaia data releases along with ground-based RV surveys improve 6-D kinematic data in both quantity and precision, as well as providing abundance information and other age tracers. A Bayesian statistical analysis of the current data tackles the two remaining problems, by rigorously posing the question: given some model for the origin of these stars, how likely are we to observe these data. This method yields kinematic ages of the Beta Pictoris moving group resp. TW Hydrae Association of ~15 Myr resp. ~7 Myr. Modelling the origins of multiple moving groups simultaneously generates probabilistic membership lists from the data and removes membership list dependencies.

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**Session Classification:** quick poster presentations