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Title: Chemo-dynamical modeling

Abstract: *Current chemo-dynamical models are tested mostly in the Milky Way on data predominantly confined to the extended solar neighborhood. However, in the near future the unprecedented sensitivity of E-ELT will allow the detection of low-mass stars thus improving our knowledge of the star formation history and stellar initial mass function both throughout the Milky Way and in external galaxies. E-ELT will also warrant the studies of stellar populations for a range of different disk morphologies in the local Universe. This will allow us to put strong constraints on current disk formation models by requiring that a given modeling technique can successfully reproduce the chemistry and morphology of different galaxy types. With this in mind, I will discuss today's status of galactic disk chemo-dynamical modeling and will present a new technique, which helps circumvent traditional problems with chemical enrichment and star formation encountered in fully self-consistent cosmological simulations. Finally, I will discuss chemo-kinematic relations in the Milky Way, which can be used to recover the assembly history of the Galaxy.*