Star cluster formation history in the Magellanic Clouds

EWASS-Symposium 9

Prague(CZ), 26-27 June, 2017

Scientific Organizing Committee

Michele Cignoni (Universitá degli Studi di Pisa) Marcella Di Criscienzo(INAF- Osservatorio di Roma) Antonino Milone (Universitá degli studi di Padova)

FOREWORD

Due to their proximity and low foreground reddening, the Magellanic Clouds (MCs) are the natural benchmark to study the formation and evolution of star clusters and represent the nearest place to observe/investigate extragalactic star clusters. Unlike the Milky Way, the MCs host clusters of all ages, including large numbers of rich, massive young and intermediate-age clusters. From a global point of view the cluster formation histories of the LMC and SMC show large differences. In the LMC there is only one cluster with an age between 3 and 12 Gyr, whereas the SMC has formed clusters more uniformly over the last 12 Gyr. Intriguingly, most of intermediate age (∼1-2 Gyr old) and young (∼100-400 Myr old) clusters show complex color-magnitude diagrams, characterized by extended main-sequence turn-off (eMSTO) and split main sequence (MS). Some authors have suggested that the eMSTO and the split of MS are due to prolonged star-formation. As an alternative, the CMD of young and intermediate-age MCs clusters may be consistent with stellar populations with different rotation rates but the same age. In terms of age, star forming regions in the MCs (< 50 Myr) show growing evidence of several episodes of star formation during their early evolution: various generations of stars formed in different bursts (a few Myr or less apart) inside different nearby sub-clusters, which may have been triggered by a previous nearby episode. Tidal interactions between the Clouds and the Milky Way can cause dramatic changes in the formation history of field stars and clusters: can we link the eMSTO phenomenon with the larger 'environment' and ' field' star formation history of the MCs? Is there any connection with the existence of multiple populations in Galactic GCs (hence with the assembly of the Galactic halo)? Finally, can we extend these properties to other irregular galaxies?

The Symposium was organized in three parts:

I: Magellanic Clouds and its star clusters
II:Recent star formation in the MCs;
III: Extended MSTOs in MC star clusters:observational and theoretical interpretation.

During this conference we have addressed these important questions, gathering the major experts on this topic to discuss the new observational findings in the light of state-of-the-art models, providing new possible scenarios for the interpretation of the observational data as documentated in the following contributions.

Finally, it is a pleasure to thank all the speakers for the high–quality standard of their contributions.

Thanks,

Michele Cignoni, Marcella Di Criscienzo and Antonino Milone