History and modes of star formation in the most active region of the Small Magellanic Cloud, NGC 346

Using deep HST/ACS images we discuss the star formation history of the SMC region NGC 346. We find that NGC 346 experienced different star formation regimes, including a dominant high density mode, with the sub-clusters hosting both pre-main sequence (PMS) and upper main sequence (UMS) stars, and a diffuse low density mode, as indicated by the presence of low-mass PMS sub-clusters. Interestingly, sub-clusters mainly composed by low mass PMS stars seem to experience now the first episode of star formation, following multi-seeded spatial patterns instead of resulting from a coherent trigger. Two speculative scenarios are put forth to explain the deficiency of UMS stars: the first invokes under-threshold conditions of the parent gas; the second speculates that the initial mass function (IMF) is a function of time, with the youngest sub-clusters not having had sufficient time to form more massive stars.