We study the star cluster population of NGC 2997, a giant spiral galaxy targeted by the Snapshot Hubble U-band Cluster Survey (SHUCS).

SHUCS aims to characterize the star cluster populations of a sample of nearby spiral galaxies (GO 12229, P.I. Linda Smith). We obtained U-band imaging with WFC3 on Hubble Space Telescope (HST) to complement archival BVI imaging. We measure accurate ages, masses, and extinctions for the star cluster population of each galaxy via SED-fitting. We can then study the cluster luminosity and mass functions, cluster formation efficiency, signatures of cluster disruption, and how all of these relate to the environment (Adamo et al. 2012; Konstantopoulos et al. 2013).

NGC 2997 is a spiral galaxy located at 9.5 Mpc harboring a star-forming circumnuclear ring. We find the cluster luminosity functions behave as power-laws with indices of $-1.7$ to $-2.3$. Some deviations from a pure power-law shape are present. However, the mass function follows a pure power-law of index $-2.2 \pm 0.2$ with no truncation at the high mass end. We find a low rate of cluster disruption over the last 100 Myr based on the power-law index of the cluster age distribution, $\zeta \sim -0.1$. We estimate the cluster formation efficiency ($\Gamma = CFR/SFR$) over the last 100 Myr, finding $7\pm2\%$ in the disk, $12\pm4\%$ in the circumnuclear ring, and $10\pm3\%$ for our entire footprint. This study highlights the need for wide-field UBVI coverage of galaxies to study cluster populations in detail, but also shows that a small sample of clusters can provide significant insight into the population’s characteristics (Ryon et al. 2014).

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References


1 University of Wisconsin-Madison, 475 N. Charter St., Madison, WI, 53706, e-mail: ryon@astro.wisc.edu
2 Space Telescope Science Institute and European Space Agency, San Martin Drive, Baltimore, USA
3 Department of Astronomy, Oskar Klein Centre, Stockholm University, SE-10691 Stockholm, Sweden
4 Astrophysics Research Institute, Liverpool John Moores University, Brownlow Hill, Liverpool L3 5RF, UK
5 Australian Astronomical Observatory, P.O. Box 915, North Ryde NSW 1670, Australia
6 Dept. Astronomy, University of Wisconsin, Madison, WI, USA
7 Department of Astrophysics/IMAPP, Radboud University Nijmegen, the Netherlands
8 (CRAQ) Université Laval. 1045, Avenue de la Médecine, G1V 0A6 Québec, Canada