The following full text is a preprint version which may differ from the publisher's version.

For additional information about this publication click this link.
http://hdl.handle.net/2066/132448

Please be advised that this information was generated on 2019-10-28 and may be subject to change.
Young Star Cluster Population of NGC 2997

J. E. Ryon\textsuperscript{1}, L. J. Smith\textsuperscript{2}, A. Adamo\textsuperscript{3}, N. Bastian\textsuperscript{4}, I. S. Konstantopoulos\textsuperscript{5}, J. S. Gallagher\textsuperscript{6}, S. S. Larsen\textsuperscript{7}, and E. Silva-Villa\textsuperscript{8}

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 $7 \pm 2\%$ in the disk, $12 \pm 4\%$ in the circumnuclear ring, and $10 \pm 3\%$ 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).

Acknowledgements Support for this work was provided by NASA through grant No. HST-GO-12229.01-A from the Space Telescope Science Institute, which is operated by AURA, Inc., under NASA contract NAS5-26555. J. E. Ryon acknowledges the support of the National Space Grant College and Fellowship Program and the Wisconsin Space Grant Consortium.

References


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