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A WFC3 study of globular clusters in NGC 4150 - an early-type minor merger

Sugata Kaviraj, R. Mark Crockett, Bradley C. Whitmore, Joseph Silk, Robert W. O'Connell, Rogier A. Windhorst, Max Mutchler, Marina Rejkuba, Suhyoung Yi, Jay A. Frogel, Daniela Calzetti

(Submitted on 25 Jul 2011)

We combine near-ultraviolet (NUV; 2250 Å) and optical (U, B, V, I) imaging from the Wide Field Camera 3 (WFC3), on board the Hubble Space Telescope (HST), to study the globular cluster (GC) population in NGC 4150, a sub-L* ($M_B \sim -18.48$ mag) early-type minor-merger remnant in the Coma I cloud. We use broadband NUV-optical photometry from the WFC3 to estimate individual ages, metallicities, masses and line-of-sight extinctions $[E_{(B-V)}]$ for 63 bright ($M_V < -5$ mag) GCs in this galaxy. In addition to a small GC population with ages greater than 10 Gyr, we find a dominant population of clusters with ages centred around 6 Gyr, consistent with the expected peak of stellar mass assembly in faint early-types residing in low-density environments. The old and intermediate-age GCs in NGC 4150 are metal-poor, with metallicities less than 0.1 Z_{Sun} , and reside in regions of low extinction ($E_{(B-V)} < 0.05$ mag). We also find a population of young, metal-rich ($Z > 0.3 Z_{\text{Sun}}$) clusters that have formed within the last Gyr and reside in relatively dusty ($E_{(B-V)} > 0.3$ mag) regions that are coincident with the part of the galaxy core that hosts significant recent star formation. Cluster disruption models (in which ~80-90% of objects younger than a few 10^8 yr dissolve every dex in time) suggest that the bulk of these young clusters are a transient population.

Comments: Submitted to MNRAS Letters

Subjects: **Cosmology and Extragalactic Astrophysics (astro-ph.CO);**
Instrumentation and Methods for Astrophysics (astro-ph.IM)

Cite as: [arXiv:1107.5042v1](https://arxiv.org/abs/1107.5042v1) [astro-ph.CO]

Submission history

From: Sugata Kaviraj [[view email](#)]

[v1] Mon, 25 Jul 2011 20:00:02 GMT (1047kb)

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