

Do Dwarf Galaxies Have Stellar Halos? – A Case Study in IC 1613

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Introduction

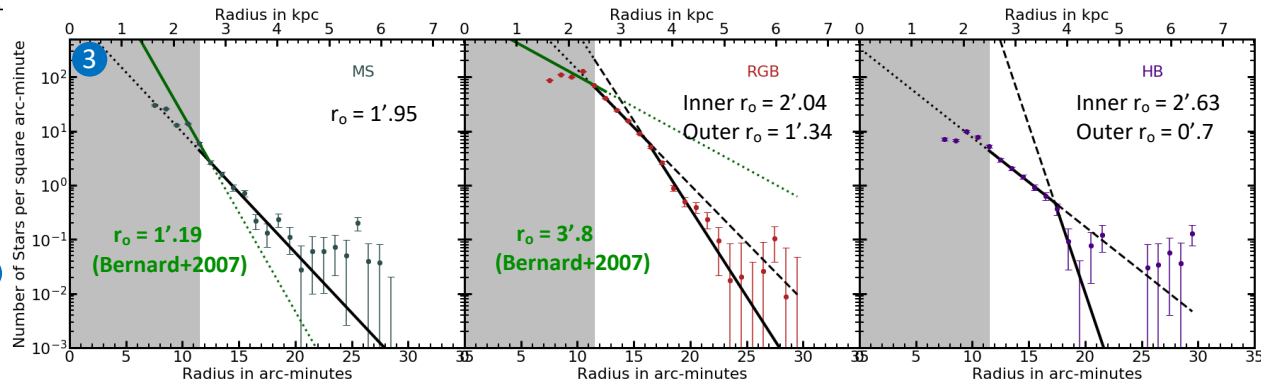
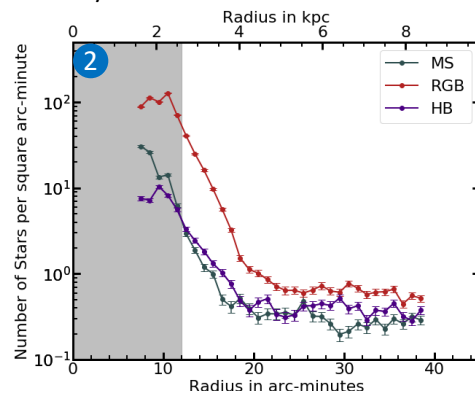
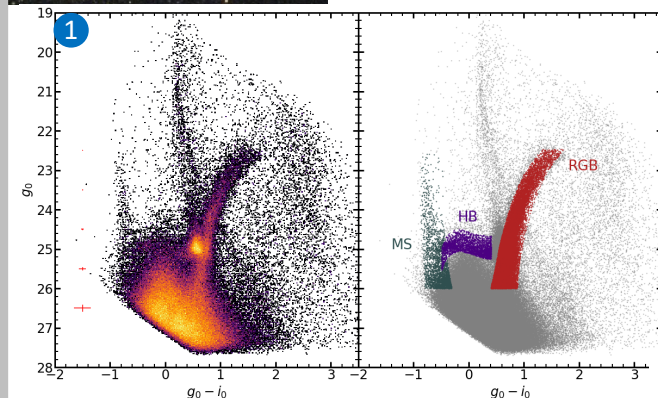
- IC 1613 - an isolated dwarf irregular galaxy, at a distance of ~ 725 kpc from the Milky Way; $M_* \sim 10^8 M_\odot$; $r_h \sim 4.8' \sim 1.01$ kpc.
- Subaru/Hyper Suprime-Cam observes to ~ 8.5 kpc from the center of the galaxy.

Motivation -- Search for evidence/extent of a stellar halo from the hierarchical assembly of IC 1613.

Pucha et. al., 2019 - arxiv: 1905.02210

Results and Conclusions

- Profiles reach background at ~ 5 kpc $\sim 5 r_h$. **Young stars as extended as old stars.**
- The outer profiles are inconsistent with the extrapolations of the inner fits. The young and old population are best fit by broken exponentials --> made of **multiple components.**
- The profiles of intermediate-to-old and old populations are consistent with that expected from an **accreted stellar halo**. On the other hand, "outside-in" shrinking scenario is also possible.



Method

- Separate different stellar tracers (MS, RGB, HB) using a color-magnitude diagram (Figure 1) of resolved stars outside of ~ 2.5 kpc.
- Construct the surface density profiles (Figure 2) and the best-fits to the background subtracted profiles (outside 2.5 kpc) are computed (Figure 3).

References: Bernard et. al., 2007, Hatt et., al. 2017, McConnachie+2012

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