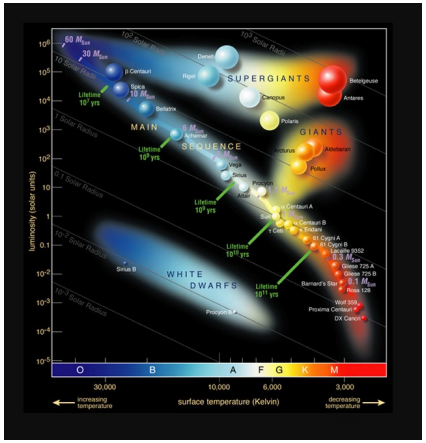
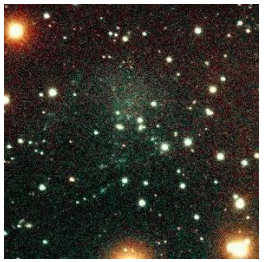
Hertzsprung Russell Diagram

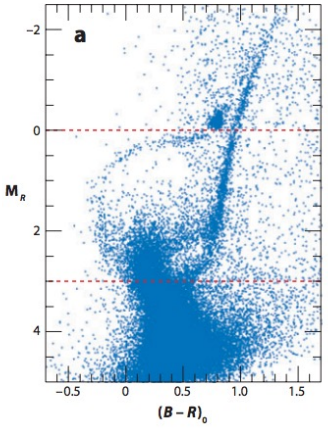
the simple version..




1

So what is this?






2

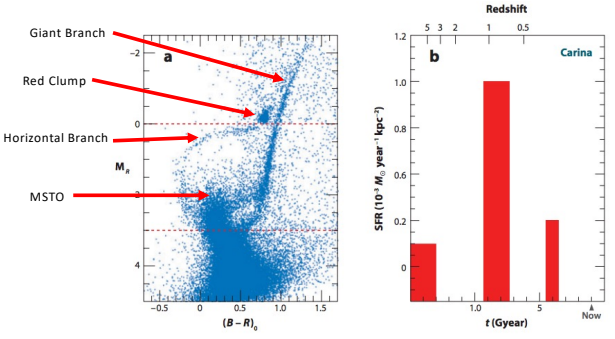


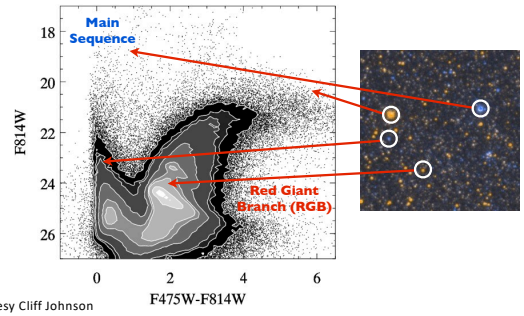

Figure 4

(*a*) A color-magnitude diagram of the Carina dwarf spheroidal (obtained by M. Mateo with the CTIO 4-m and MOSAIC camera, private communication) in the central 30′ of the galaxy. This clearly shows the presence of at least three distinct MSTOs. (*b*) The star-formation history of the central region of Carina determined by Hurley-Keller, Mateo & Nemec (1998), showing the relative strength of the different bursts. The ages are also shown in terms of redshift.

3

# The Color-Magnitude Diagram (CMD)

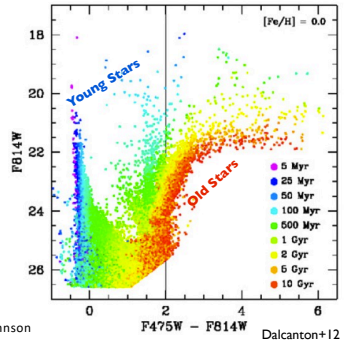
Real galaxies ....




Courtesy Cliff Johnson

4

# Age Dating with CMDs




Courtesy Cliff Johnson

Dalcanton+12

5

Isochrones

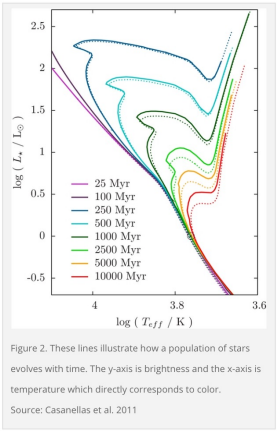
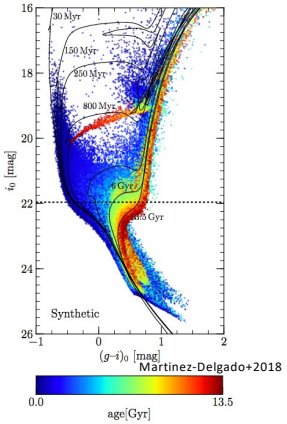



Figure 2. These lines illustrate how a population of stars evolves with time. The y-axis is brightness and the x-axis is temperature which directly corresponds to color.

Source: Casanellas et al. 2011



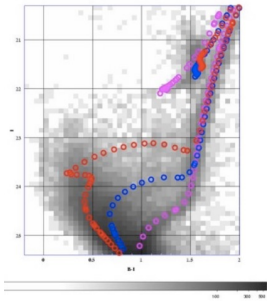

Martinez-Delgado+2018




6

Deriving SFH from CMDs: SFH of a quenched dwarf: Leo I

$M_* \sim 5 \times 10^6\ M_\odot$



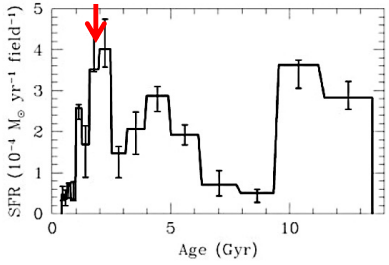
Smecker-Hane in prep, Gallart+1998

**Orbits: HST Proper motions**

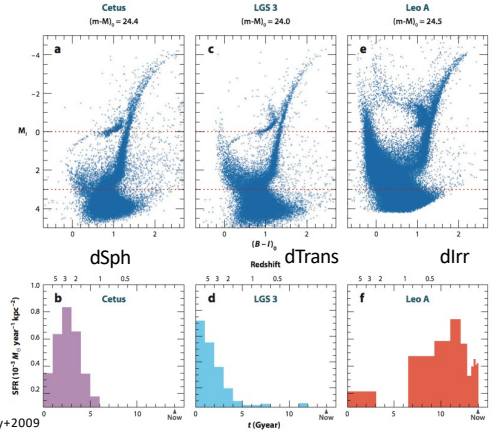
Accretion by Milky Way

2 Gyr ago (Sohn, GB+2013)

**Rapid quenching** (Wetzel+2015)




7



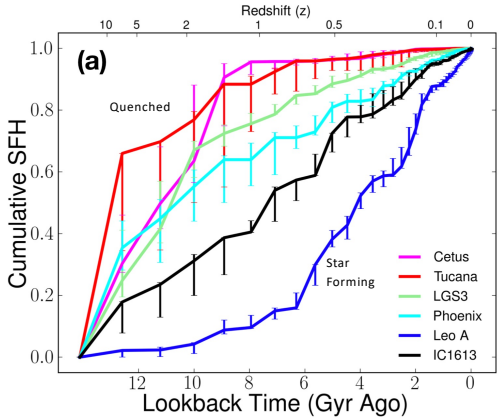

Tolstoy+2009

8

## Cumulative SFHs

The SFHs of isolated (>300 kpc from the MW/M31) dwarf galaxies measured from deep CMDs (Skillman et al. 2014). The varied SFHs trace their diverse assembly history. *HST* can only provide deep CMDs for 9 isolated galaxies, while *JWST* can access hundreds.

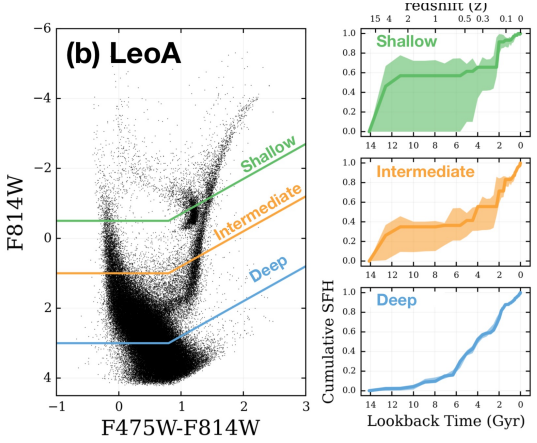
JWST ERS Proposal
PI Weisz




9

## The Need for JWST

JWST ERS Proposal
PI Weisz




10

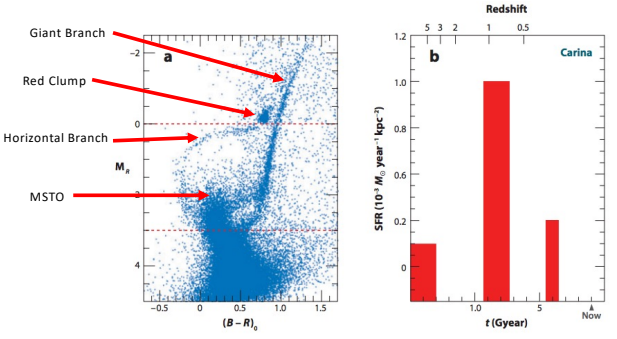
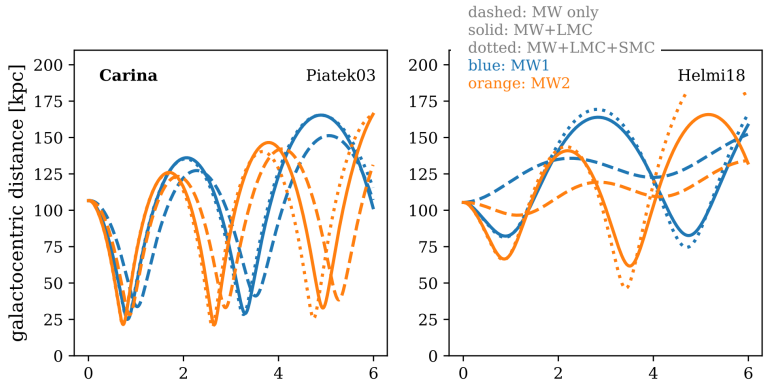



Figure 4
(*a*) A color-magnitude diagram of the Carina dwarf spheroidal (obtained by M. Mateo with the CTIO 4-m and MOSAIC camera, private communication) in the central 30′ of the galaxy. This clearly shows the presence of at least three distinct MSTOs. (*b*) The star-formation history of the central region of Carina determined by Hurley-Keller, Mateo & Nemec (1998), showing the relative strength of the different bursts. The ages are also shown in terms of redshift.

11




Patel + 2020

12