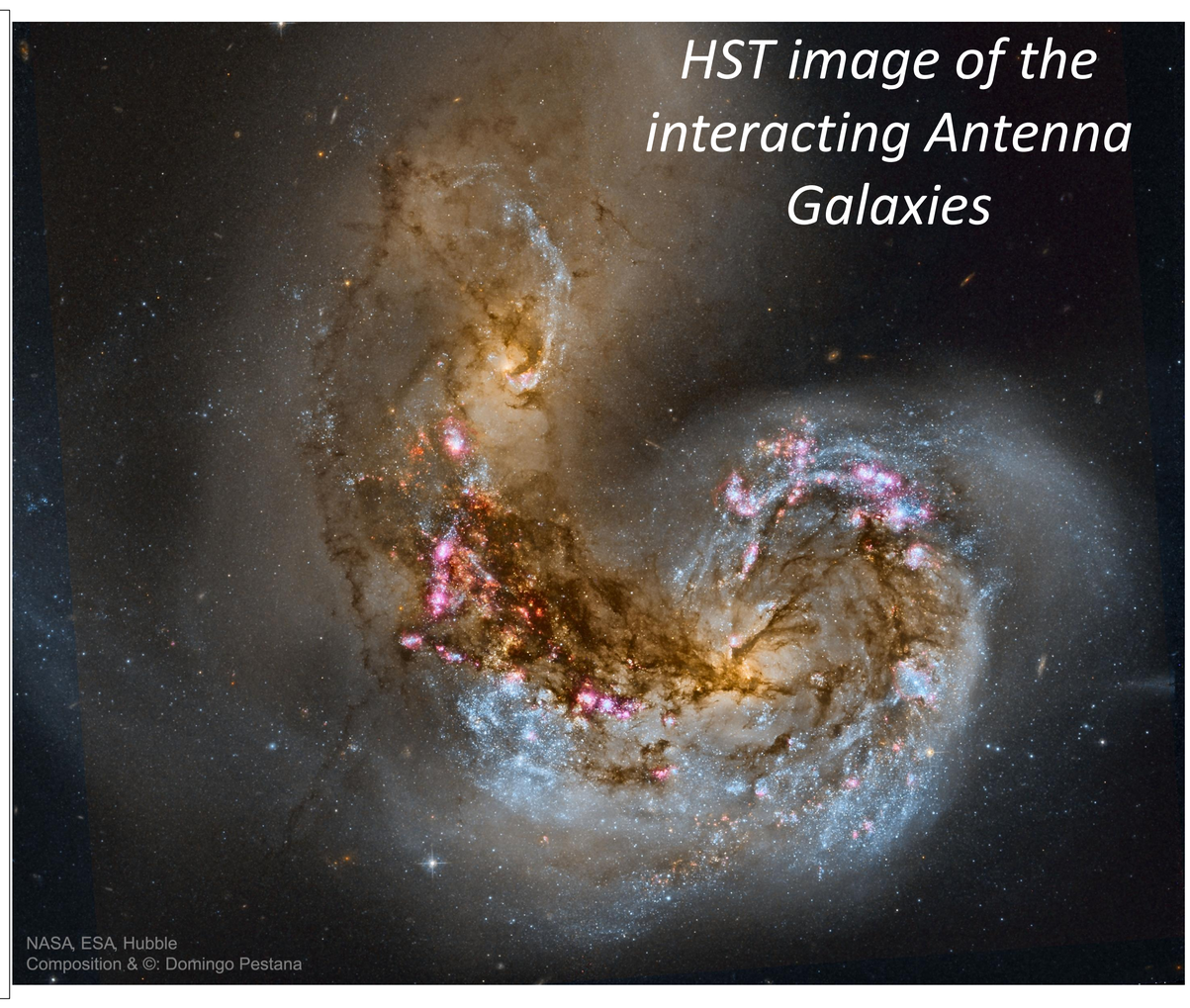
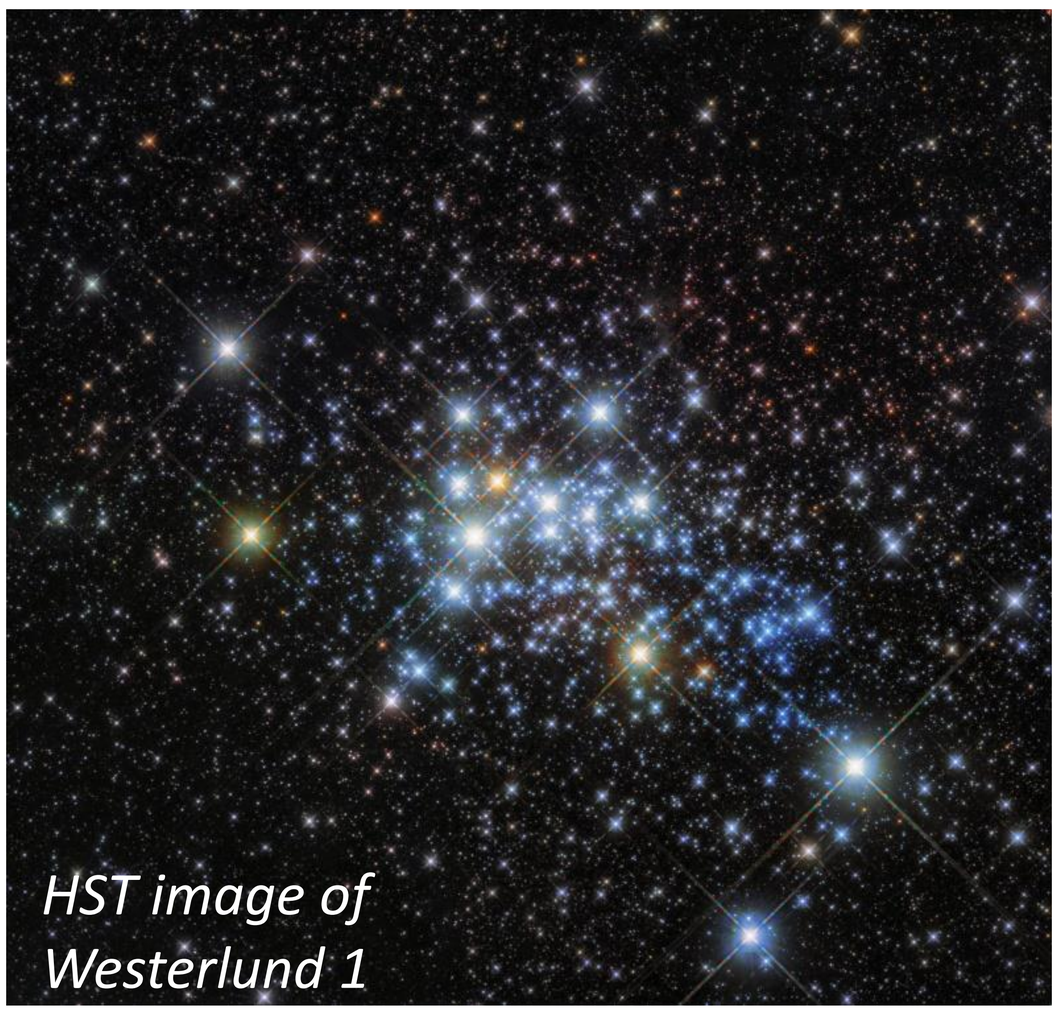
EWOCS (Extented Westerlund One Chandra, and JWST, Survey)

M. G. Guarcello (INAF-OAPA) and the EWOCS team

In starburst regions star formation occurs at a rate much larger than in the typical star forming regions of our Galaxy. Starburst clusters contain tens of thousands to millions of stars and, despite being rare in our Galaxy today, they are common in the early Universe, in starburst and merging galaxies (Adamo et al. 2020). ***Starburst clusters represent thus precious targets to study formation and evolution of stars and planets in very extreme environments which characterize specific periods in galactic evolution***.



HST image of the interacting Antenna Galaxies



HST image of Westerlund 1

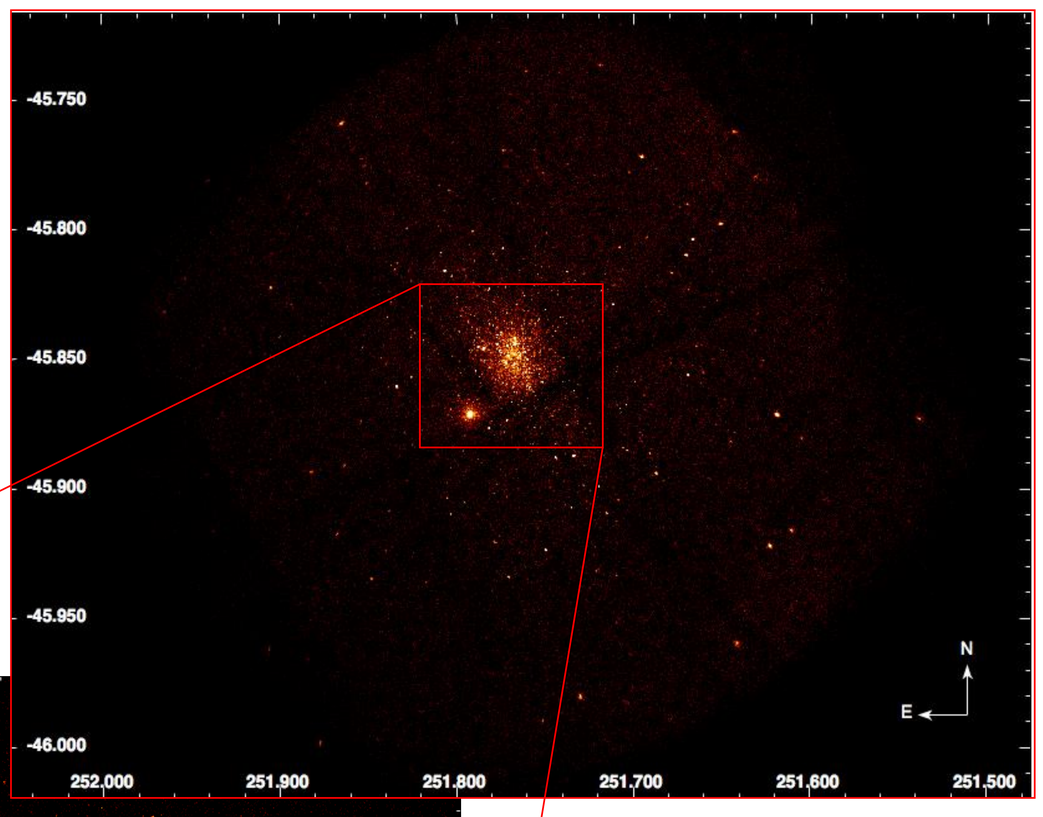
- ***Westerlund 1 is the closest starburst cluster to the Sun*** (about 3.9 kpc, *Davies & Beasor 2019*).
- It is **3-5 Myrs old** and with an **age spread <1Myr** (e.g., *Kudryavtseva et al. 2012*);
- It has a present-day **total mass ranging between 20000$M_\odot$ to 45000$M_\odot$** (*Andersen et al. 2017*).
- Its known **massive population** counts 1 LBV star, 7 A/F hypergiants, 24 WR stars, and more than 100 OB supergiants (*Clark et al. 2010*).
- It also hosts the **magnetar** CXOU J16 (*Muno et al. 2006*), and it represents the perfect environment where **Intermediate Mass Black Holes can form** (*Portegies Zwart et al. 2004*)

The ***EWOCS (Extended Westerlund One Chandra, and JWST, Survey),*** aims at identifying the low mass stellar population of Westerlund 1 with the objective of:

- Test protoplanetary disks evolution, planets formation and early evolution in starburst.
- Understand how starburst clusters form and evolve.
- Study the X-ray properties of this unique ensemble of massive stars in such a rich range of evolutionary phases.
- Test the IMF and the formation of brown dwarfs in starburst.

We will also study the post-outburst state of CXOU J16 and search for IMBHs.

The project is based on a ***1Msec Chandra Large Project***, a 19.7 hours ***JWST observation*** (MIRI, NIRCAM), ***GeMS/GSAOI observations***, and existing datasets at high spatial resolution (such as HST)



ACIS-I image of Westerlund 1 (430ksec done so far)

The EWOCS Team

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