The Star Forming Tail of IC3418

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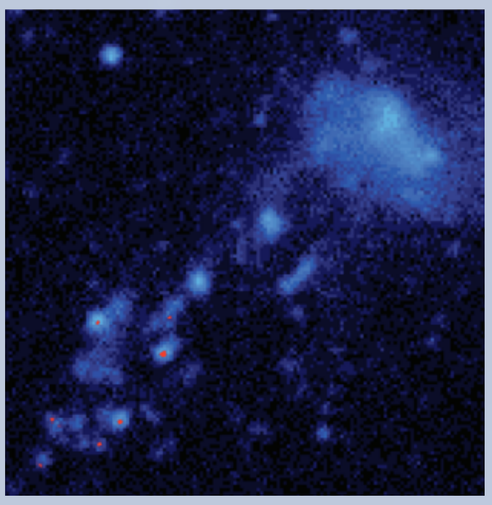
Background

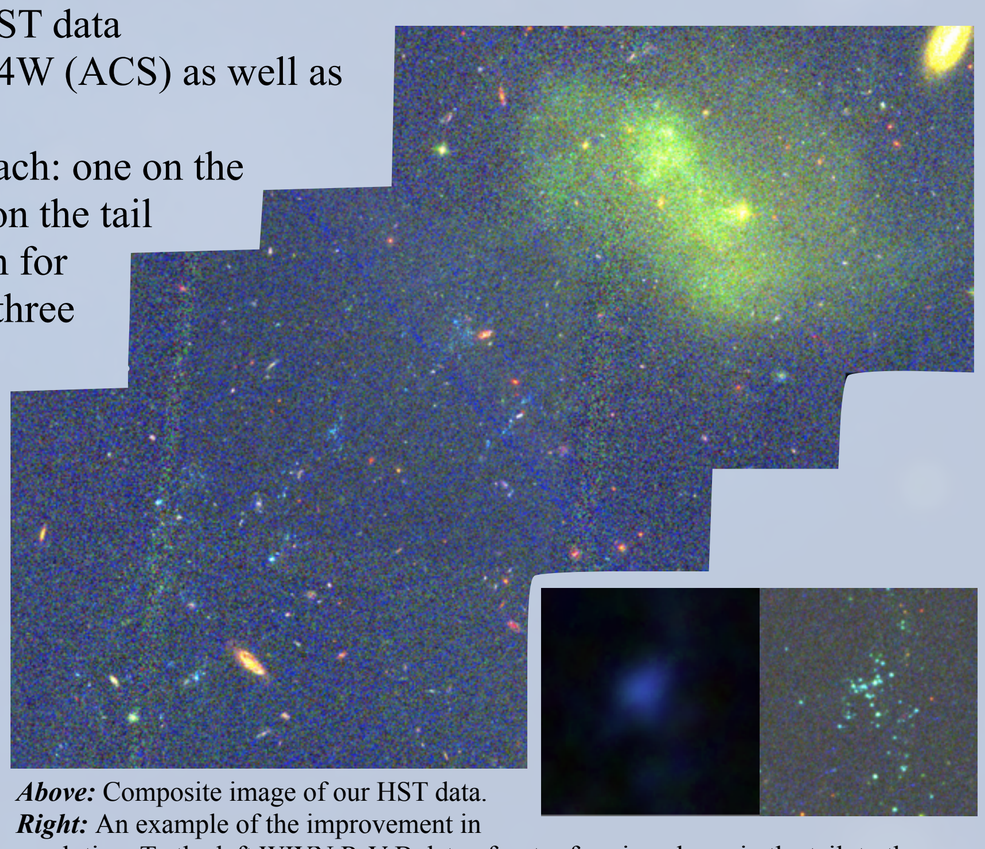
IC3418 is a dwarf irregular galaxy in the Virgo cluster with a 17kpc long, star forming, ram pressure tail [2]. Ram pressure stripping only removes neutral hydrogen, and how it cools to form stars here is unknown[3]. We have F275W, F475W and F814W HST images of the galaxy and tail, with which we expect to see individual stars or star forming regions. By comparing our photometry to model spectra we endeavour to learn about the structure and age of these objects and ultimately about how stars are formed in this unusual environment.



Hα+[NII] (red) and NUV (blue) from Kenney et al. (2014)

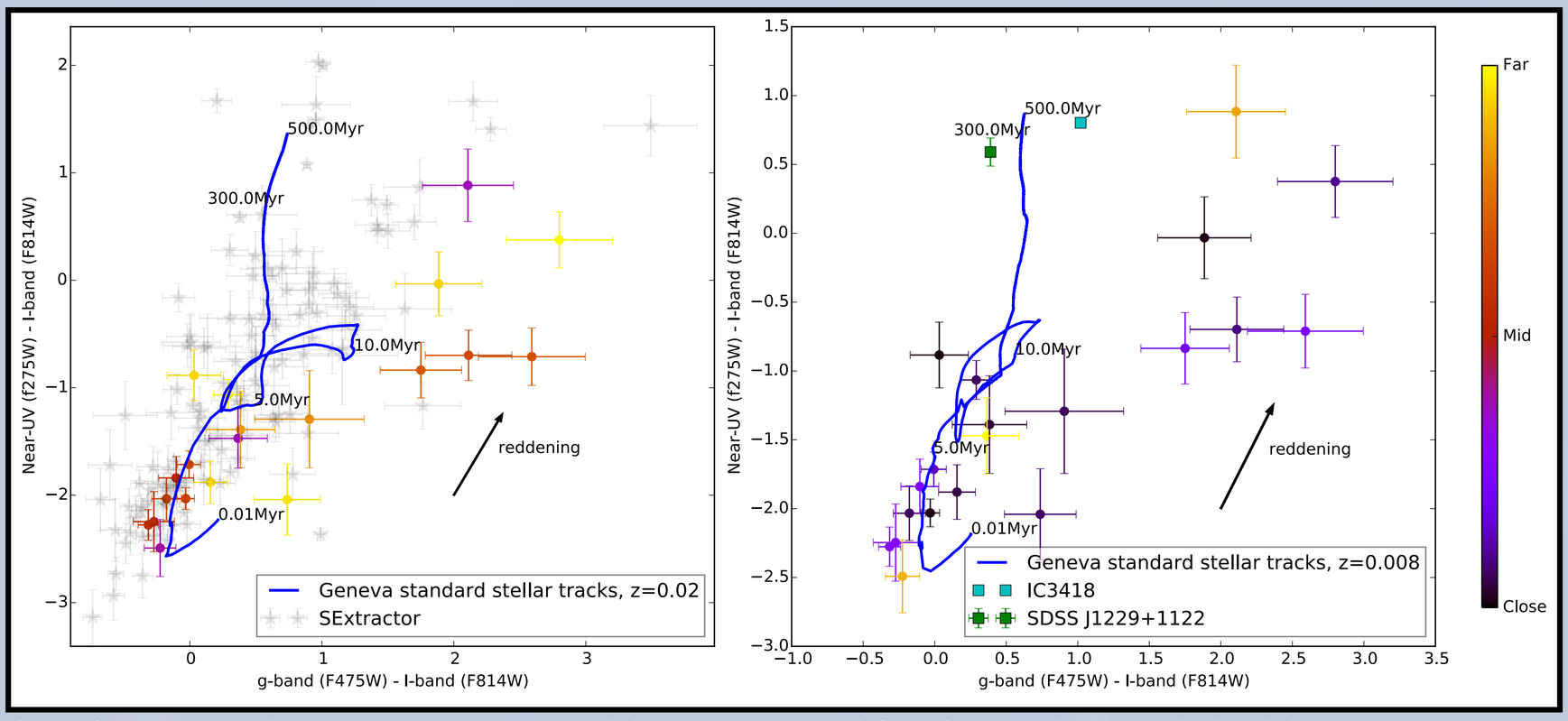
Data

- Four orbits of HST data
- F475W and F814W (ACS) as well as F257W (WFC3)
- Two pointings each: one on the galaxy and one on the tail
- Two dithers each for ACS pointings, three for WFC3
- Increased resolution lets us see single stars / star forming regions
- UV serves as probe of recent star formation



Above: Composite image of our HST data.
Right: An example of the improvement in resolution. To the left WIYN R-V-B data of a star forming clump in the tail, to the right is our HST data of the same region.

Probing the Sites of Recent Star Formation?

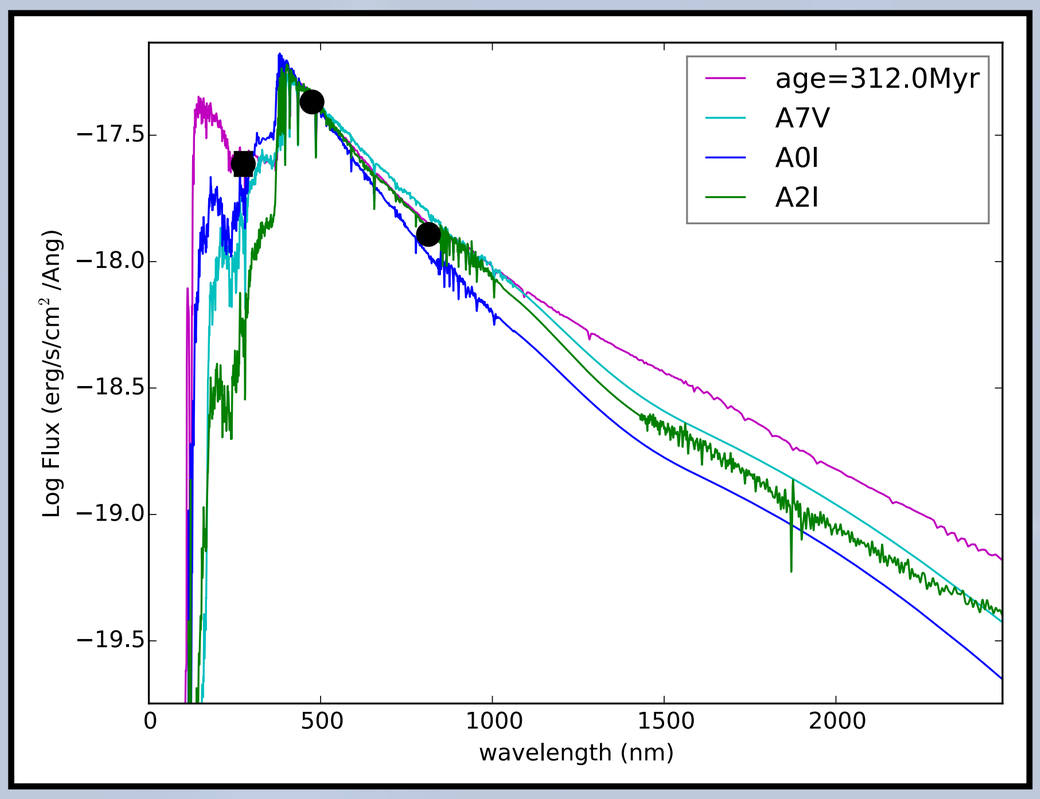


Colour-Colour diagrams. The circles are visually selected UV bright sources, and with S/N > 3 in each of our bands. To the left they are coloured by their distance to the galaxy, to the right by the minimum distance to an HII region identified by Hα imaging. The blue lines are galaxy evolution tracks with different metallicities from Starburst99 [5], the pale black stars are sources selected using SExtractor [1], the green square is SDSS J1229+1122 (discussed below), and the cyan square is IC3418 itself.

- Main analysis involves comparing the colour and magnitudes of sources visually identified to be part of the tail to:
  - IC3418
  - model galaxy with a single burst of star formation from Starburst99 [5]
  - random sample of point sources selected using SExtractor [1]
  - SDSS J1229+1122 (discussed below)
- Looked for trends in colour with distance to IC3418 and to Hα sources
- Majority of tail sources seem consistent with sites of recent (<5Myr) star formation
  - ↳ Consistent with tidal stripping timescale of Kenney et al. (2014)

Possible Single Supergiant?

- Ohyama & Hota (2013) suggest SDSS J1229+1122 is a single supergiant
- Would be most distant single star observed
- Colour and magnitude different from other sources (see above)
- Photometry consistent with a single A type star or a 300Myr population
  - ↳ Would be among brightest A0I stars [8] or barely within stripping timescale [4]
- IR observations could help distinguish difference



Right: Comparison of our Hubble photometry (black points) with model spectra been scaled to match the measured F475W flux. `age=312.0Myr' is the best fit from the Starburst99 model[5] and the following three lines are stellar spectra from Pickles[7].

References

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Background Image: composite of data from the Galaxy Evolution Explorer and the Sloan Digital Sky Survey

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