

Dust Evolution at Low Metallicity: A JWST Study of NGC 6822

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NGC 6822

- Tidally isolated barred irregular galaxy
- Local Group object (~500kpc)
- Metal poor (~0.25Z_⊙)
- Analogous star forming system to peak star forming epoch (z=2)

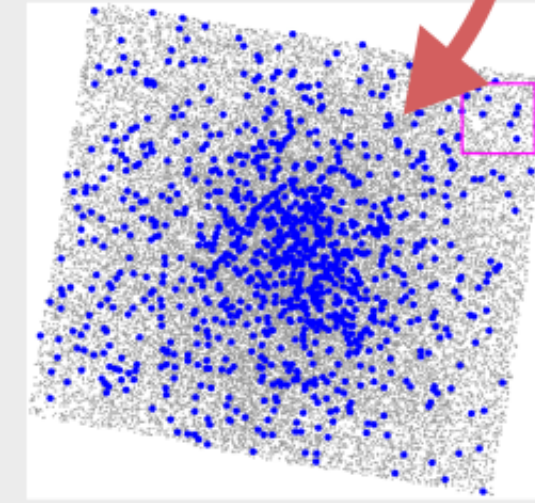
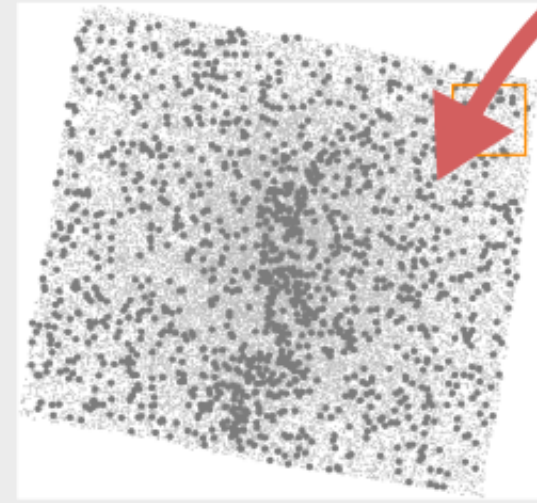
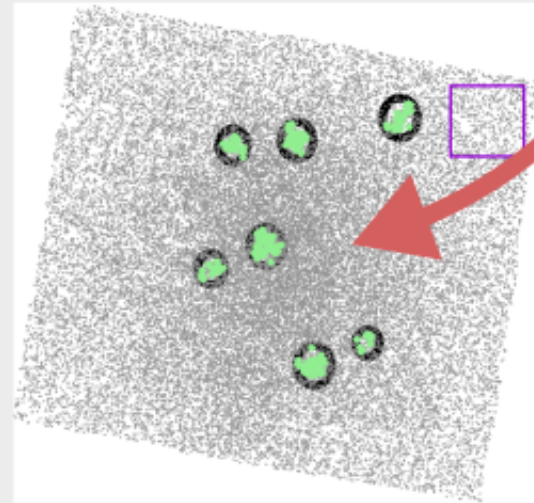
Infrared Stellar Populations

- NGC 6822 has a range of stellar population
- Deeply embedded star forming regions
- Diffuse/structureless AGB population
- RSGs show structure along central bar
- Bright active localised star formation

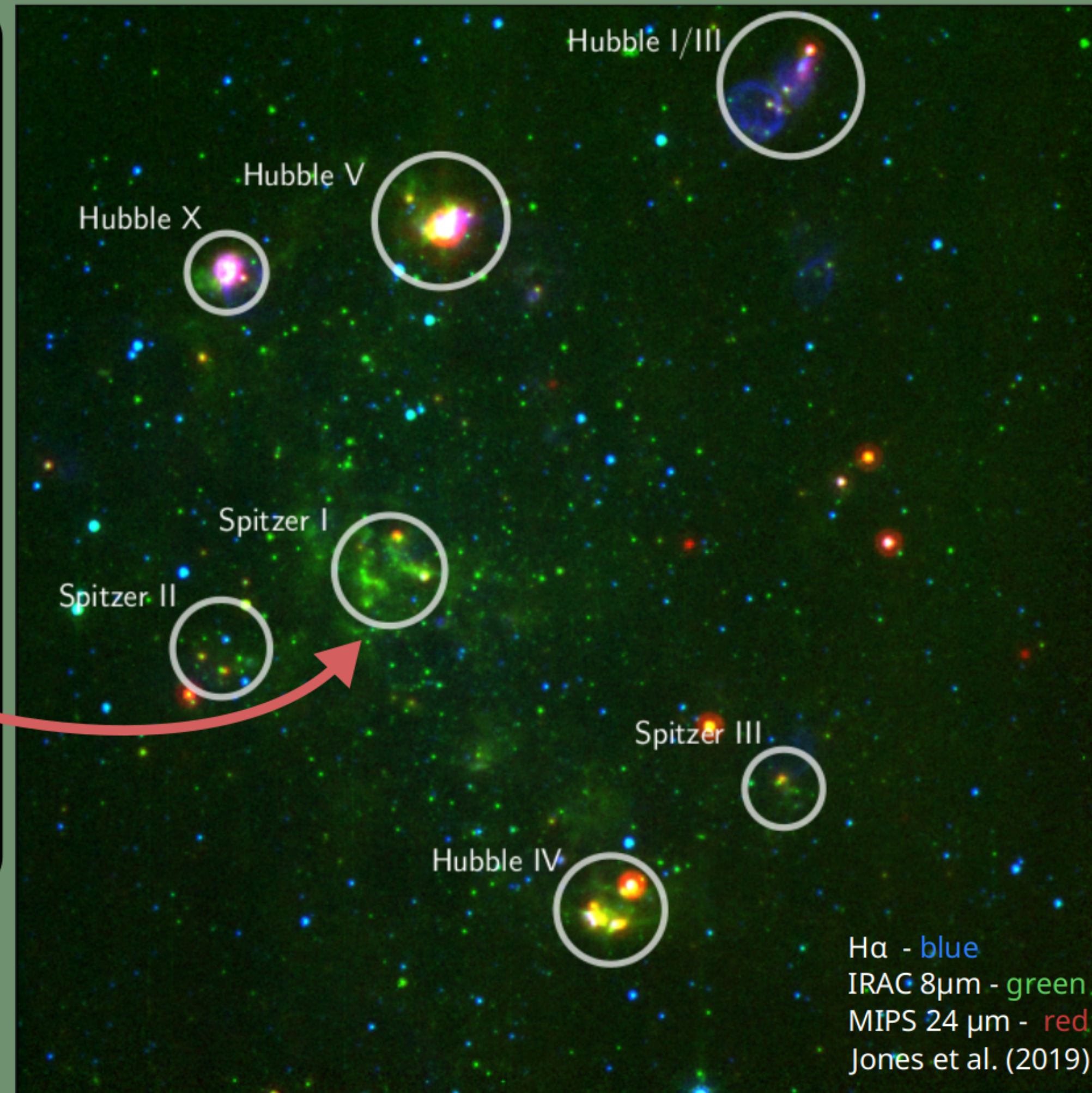
YSO

RSG

AGB

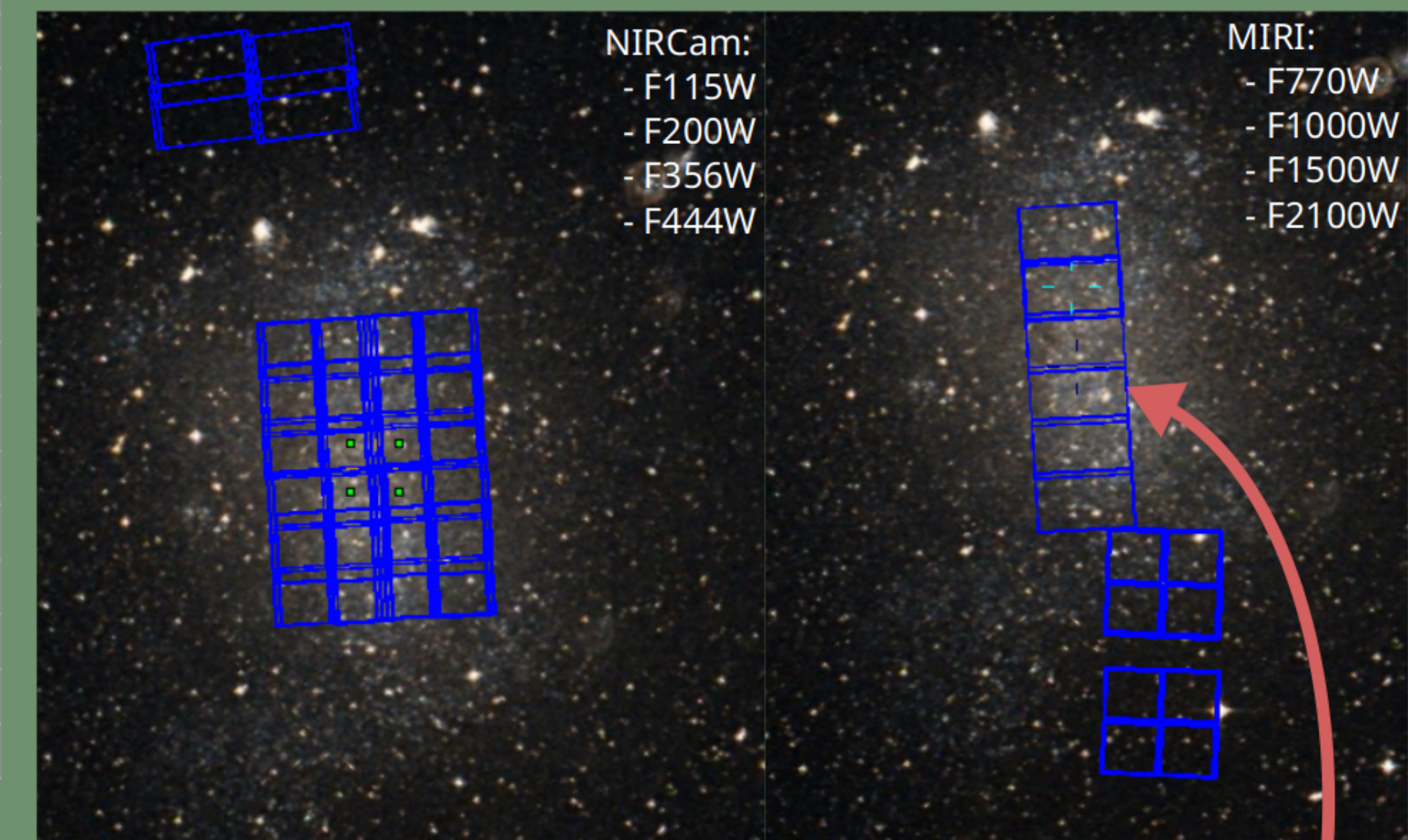


Hirschauer et al. (2020)



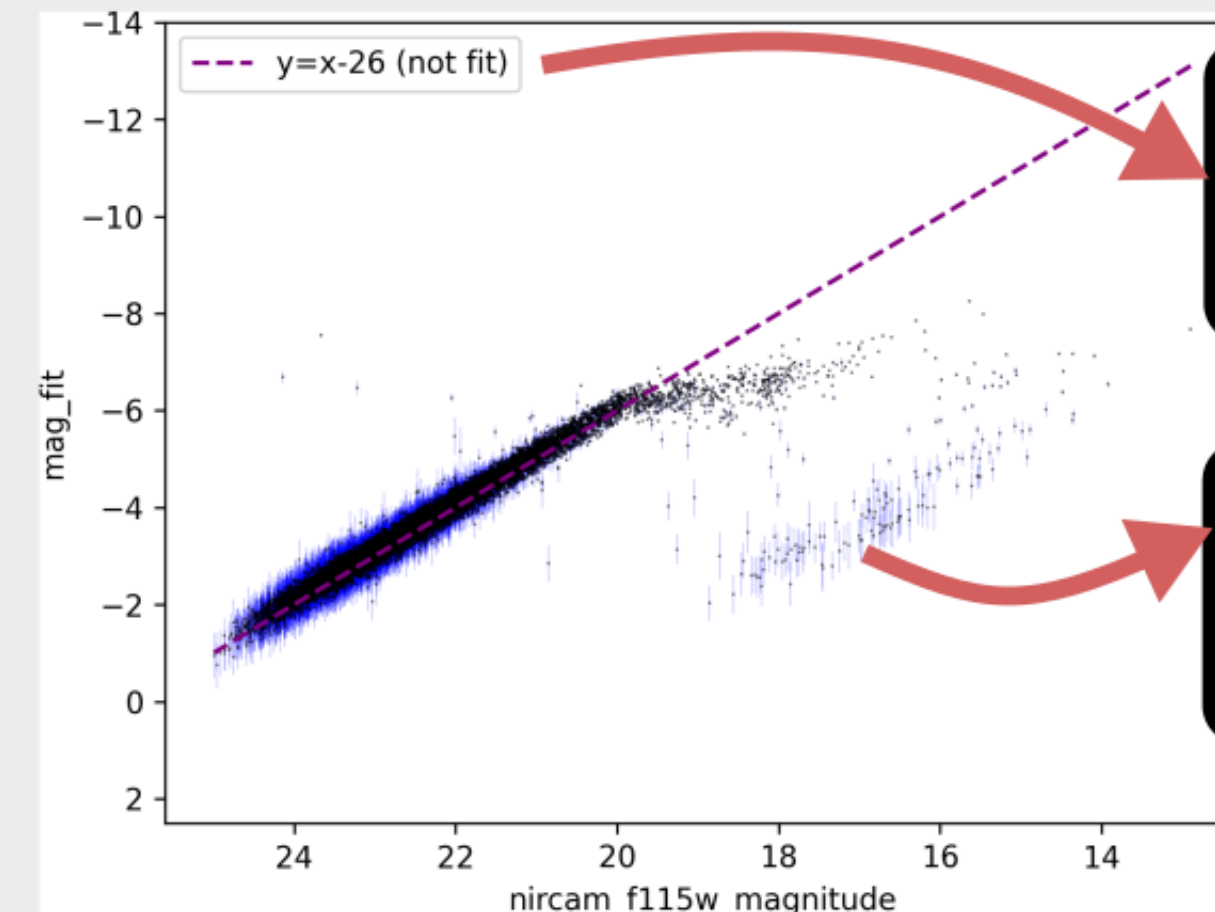
JWST Study of NGC 6822

- 20 hours program with 8 NIRCcam and MIRI filters
- Star formation resolvable down to 2M_⊙
- Intermediate and old populations resolved several magnitudes below the Red Clump
- Scheduled September 2022



Starbug II - Photometry Pipeline

- JWST PSF photometry in python PHOTUTILS
- Optimised for compact field photometry in dust embedded environments with complex diffuse emissions



Starbug output comparison to MIRAGE simulated data input shows near perfect 1-to-1 relation

High luminosity "turn-off" due to saturation effects in the MIRAGE MIRI data simulation

- <https://github.com/conornally/starbug2>

Key Science Areas

- High resolution IR data will allow us to study dust enshrouded young stellar objects
- Evolved stars with high mass loss rates
- Star formation histories at very low metallicity
- Understanding mechanisms at play during the epoch of peak star formation

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