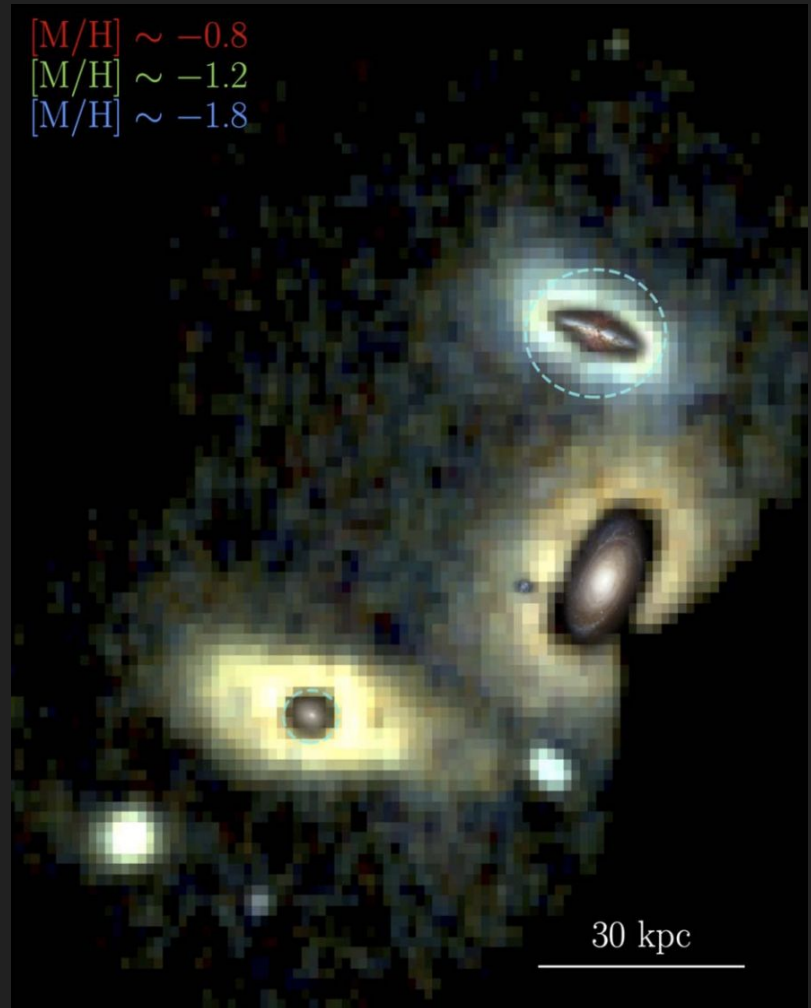


# The Outskirts of M82 and NGC 3077: A Timeline of the M81 Group

Benjamin Velguth

# Why their Outskirts?

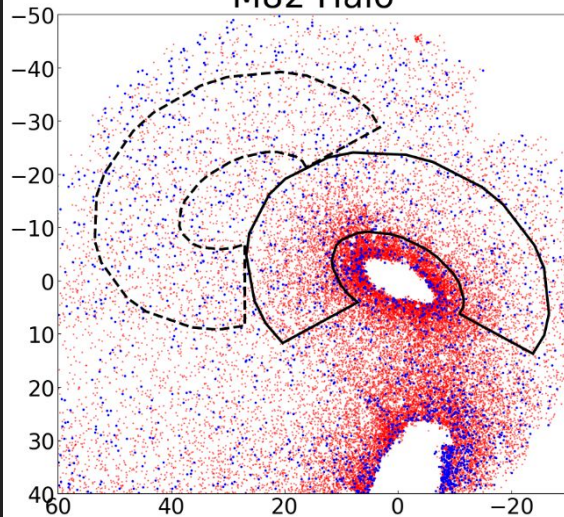
- Fossil records of galactic mergers
  - Fast, dramatic change to a galaxy
  - BH growth, changes in star formation rate, thicken or disrupt a disc
  - Understood through stellar halos and tidal streams
- This group is in the early stages of merging, giving insight into the past, present, and future of a massive merger event



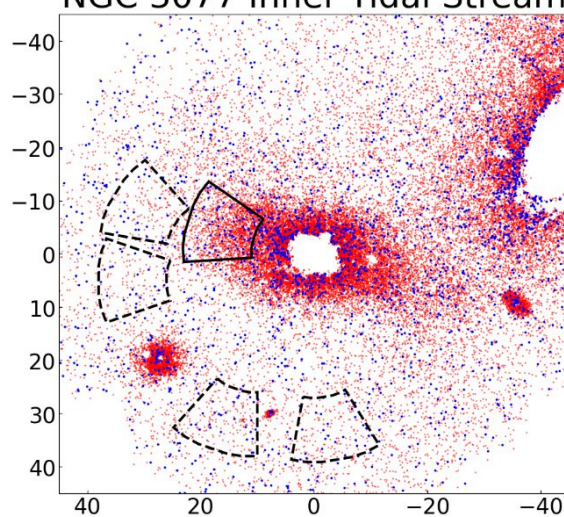


# What we Measure

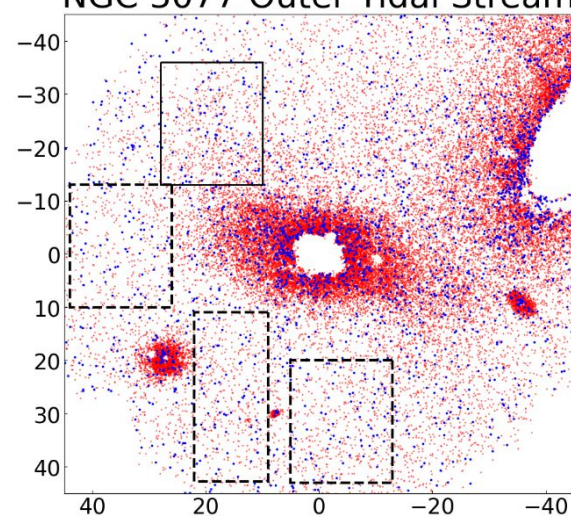
M82 Halo



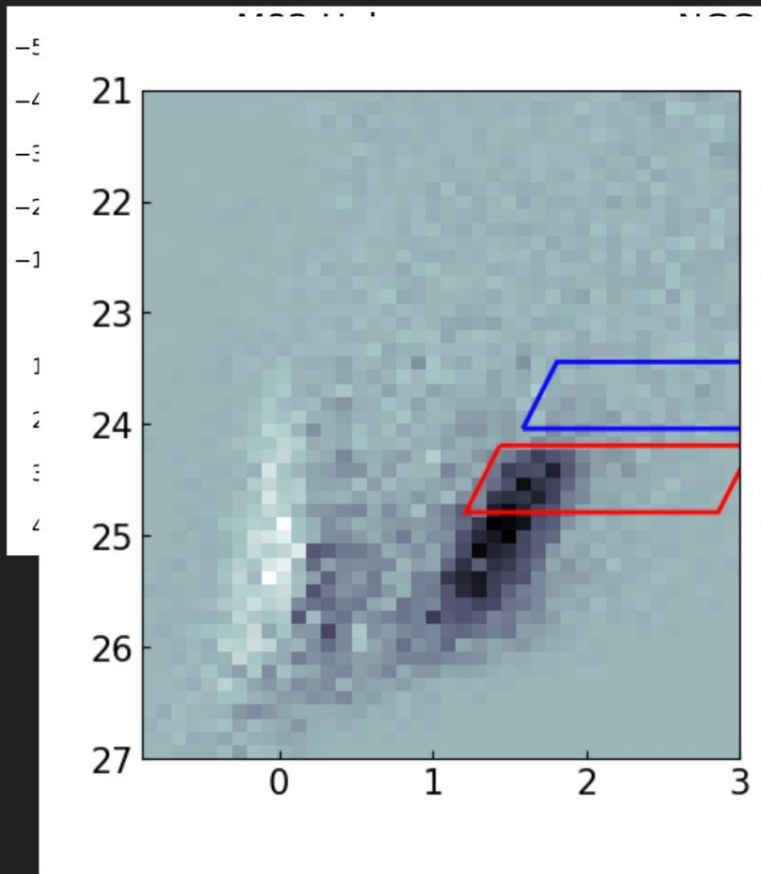
NGC 3077 Inner Tidal Stream



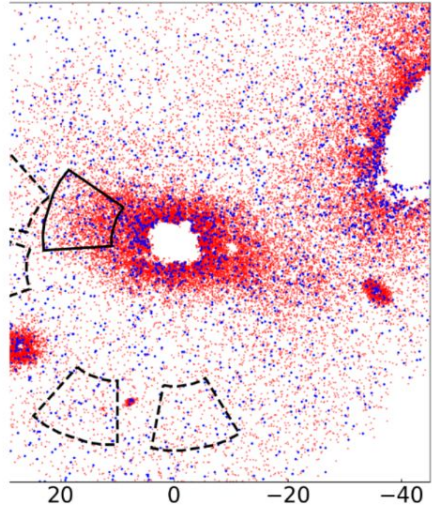
NGC 3077 Outer Tidal Stream



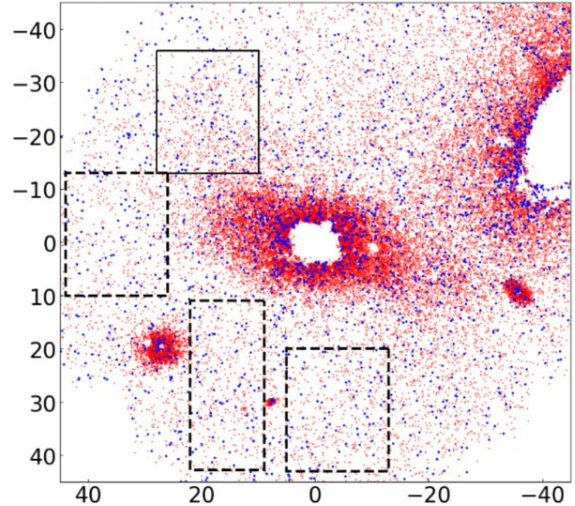
# What we Measure



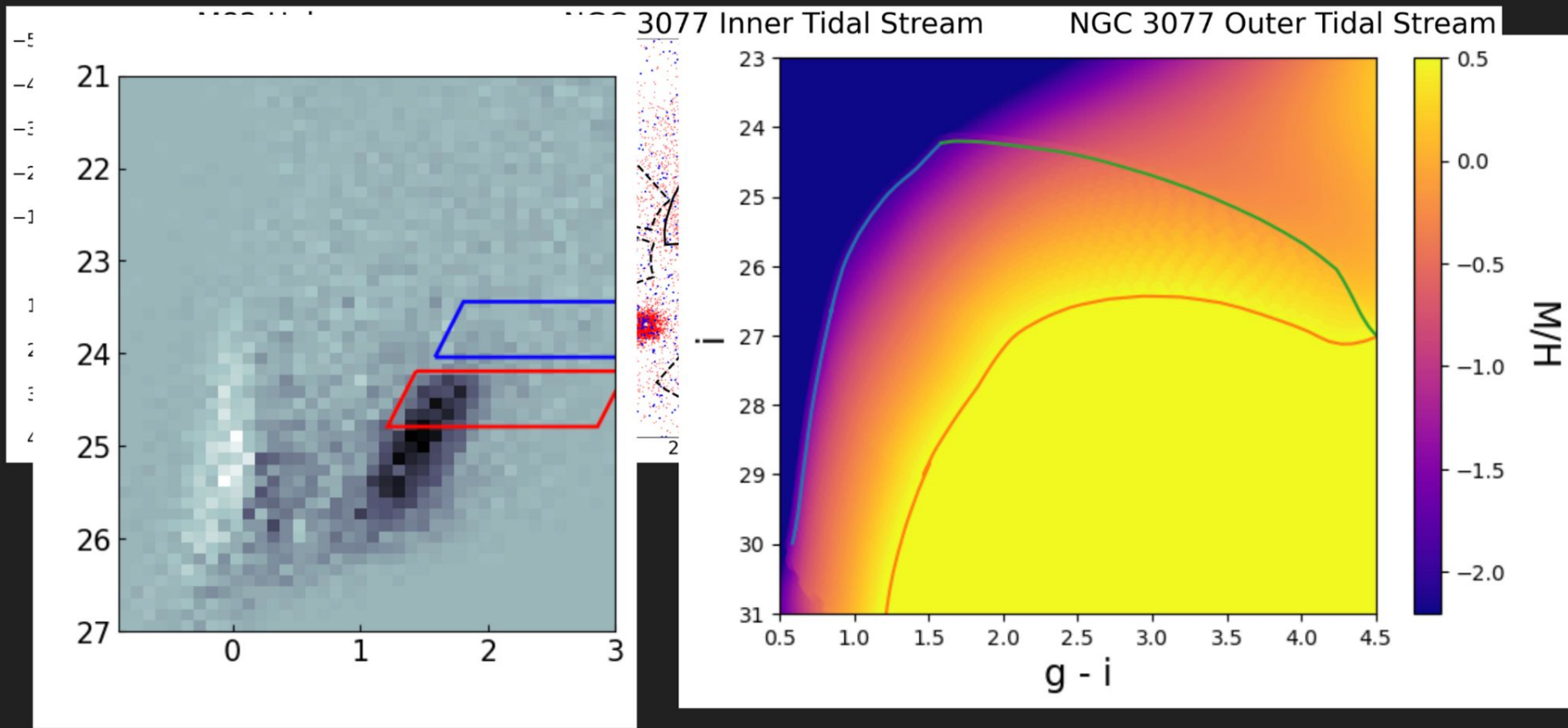
NGC 3077 Inner Tidal Stream



NGC 3077 Outer Tidal Stream



# What we Measure



# Results

	$N_{*,AGB}$	$N_{*,TRGB}$	$\log_{10}(N_{*,AGB}/N_{*,TRGB})$	$t_{90}$ (Gyr)	[M/H]
M82	$126 \pm 21$	$1990 \pm 50$	$-1.19 \pm 0.07$	$6.6 \pm 2.6$	$-1.56 \pm 0.40$
NGC 3077 (inner tidal stream)	$70 \pm 9$	$908 \pm 42$	$-1.11 \pm 0.06$	$5.7 \pm 2.4$	$-1.39 \pm 0.37$
NGC 3077 (outer tidal stream)	$16 \pm 6$	$140 \pm 54$	$-0.93 \pm 0.23$	$3.6 \pm 3.3$	$-1.54 \pm 0.37$

## M82:

- Intermediate aged halo (~6.6 Gyr)
- Metal poor
- $\sim 2 \times 10^8 M_{\odot}$
- This halo formed from the merger of a dwarf satellite 6.6 Gyr ago

## NGC 3077:

- Minor age gradient along the tail
- Metal poor
- Stars in the tails are older than the tails themselves

