

A crucial test in stellar halo physics: star counting versus integrated photometry techniques

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Motivation

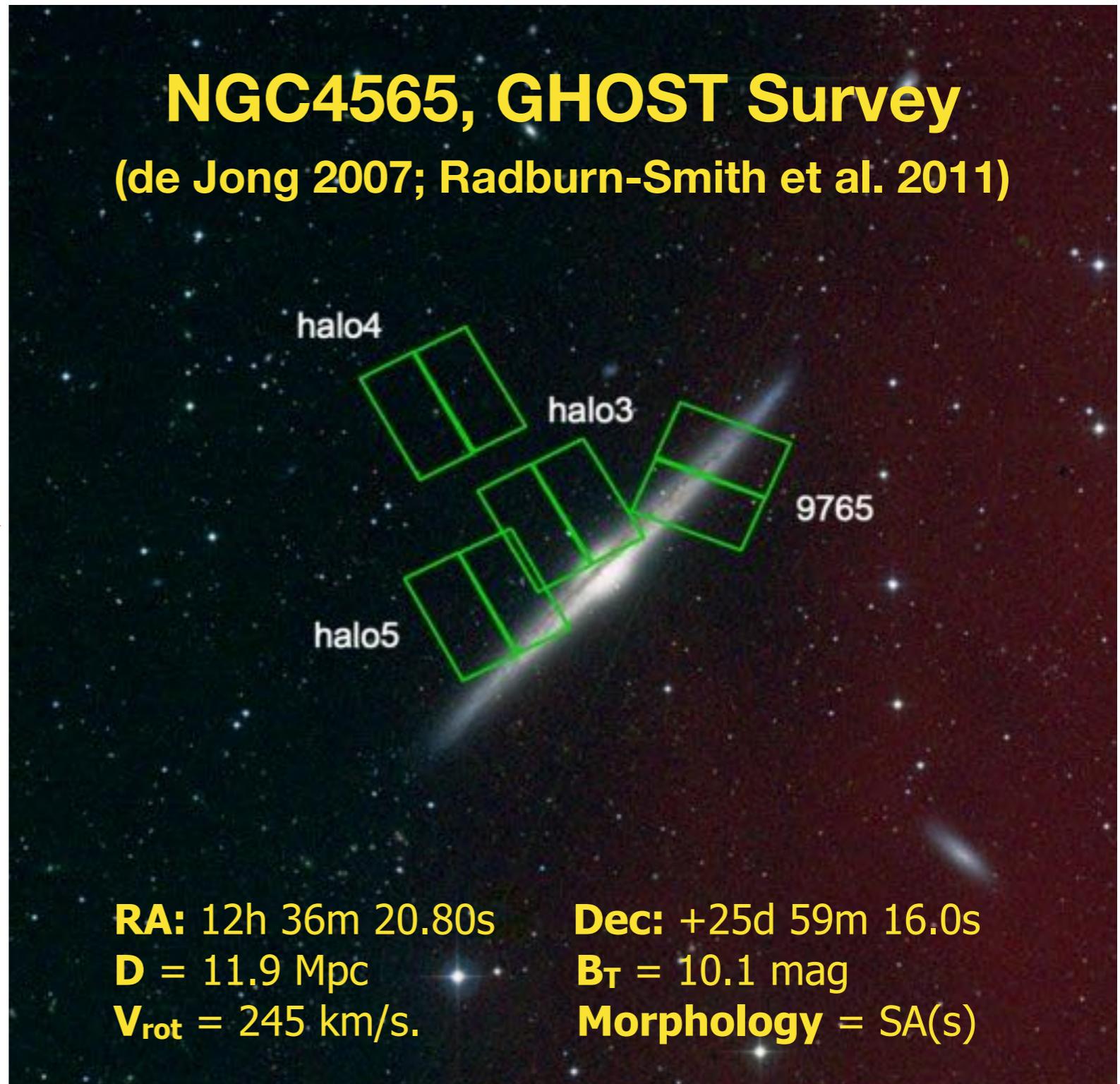
Star Counting with HST
 $D \leq 16 \text{ Mpc}$
(Zackrisson et al. 2012)



**Are they in
agreement?**

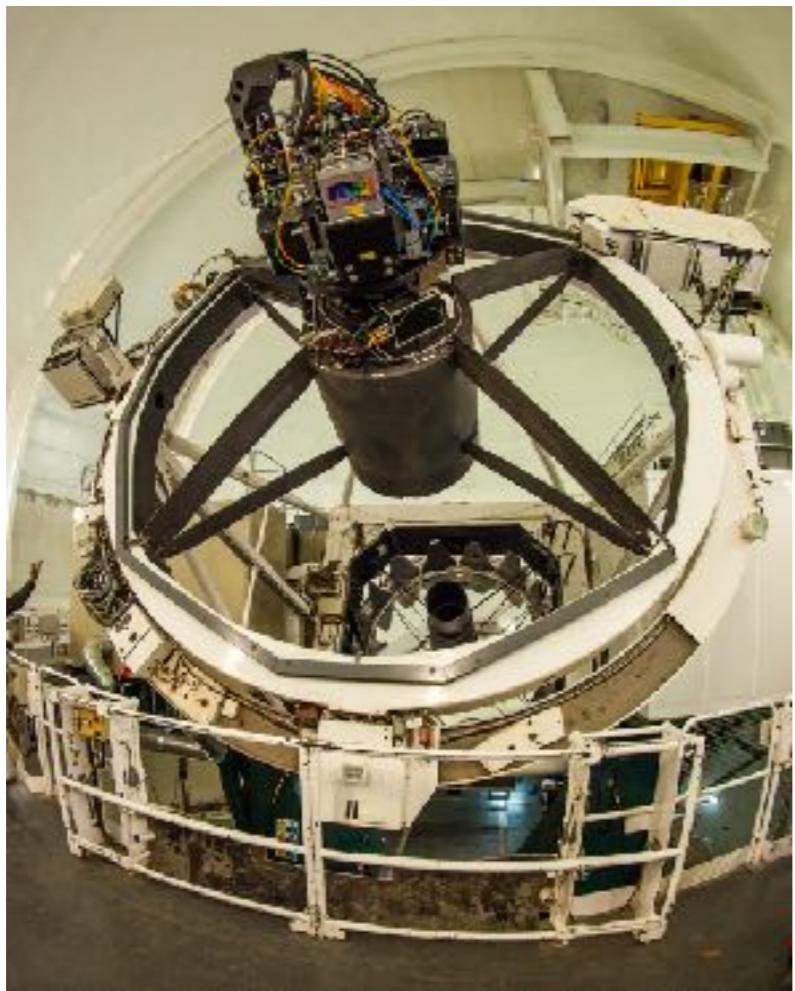


Integrated photometry
 $D \gtrsim 150 \text{ Mpc}$
(Trujillo & Fliri 2016)



Ultra deep imaging with WHT

**William Herschel
Telescope (4 m)
La Palma
+
PAUCAM Camera**

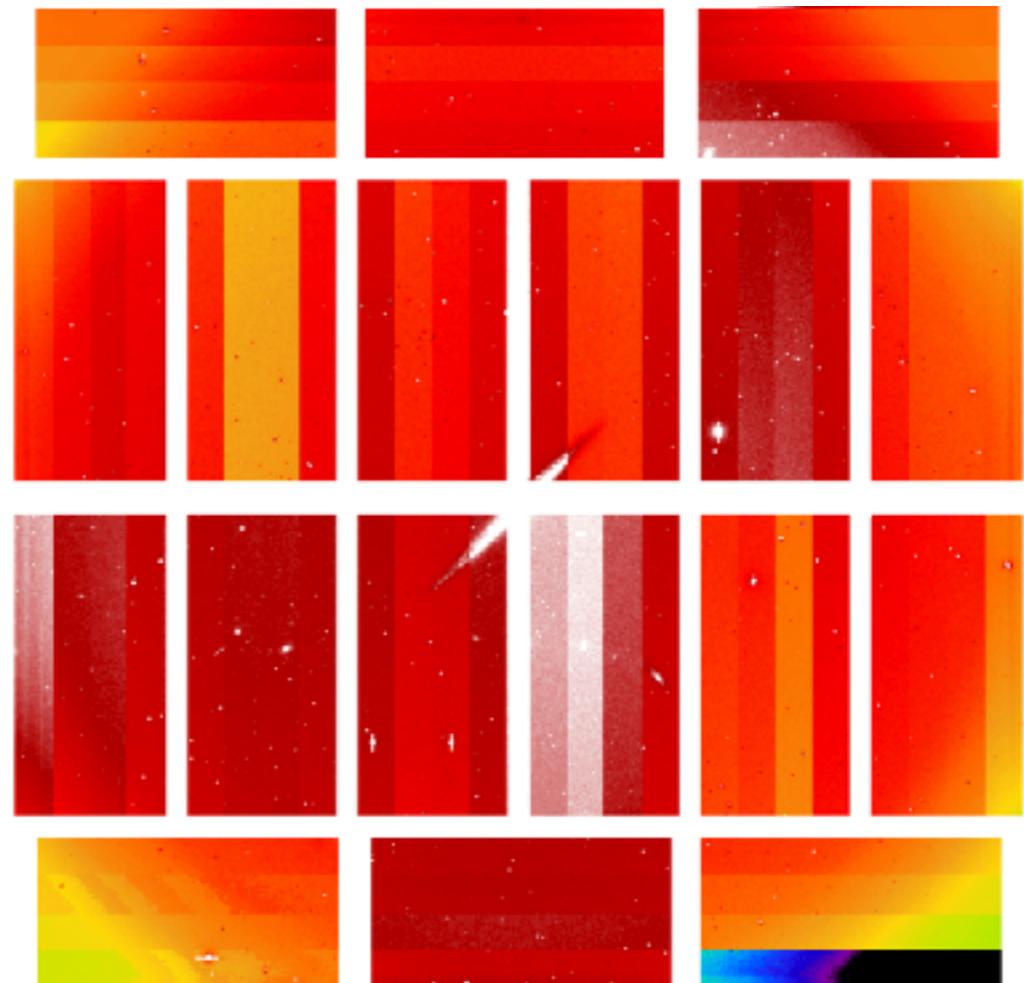


SDSS Filters

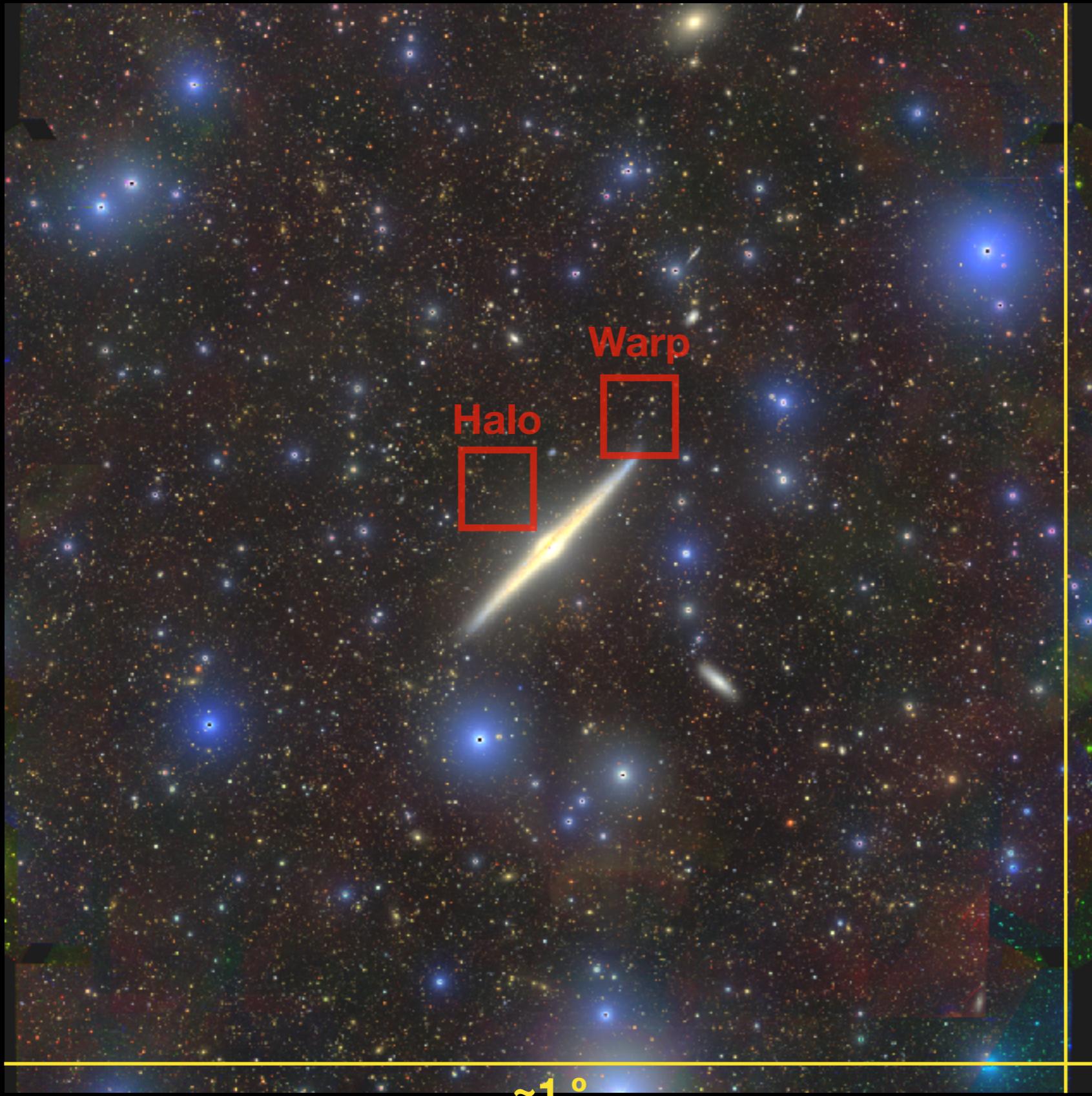
$g \sim 4.8$ h
 $r \sim 3.1$ h
 $i \sim 4.4$ h

RAW data

18 CCDs
4 Channels/CCD
FOV ~ 1 degree



NGC4565 color image



Limiting magnitudes

3-sigma $10'' \times 10''$ arcsec 2 boxes

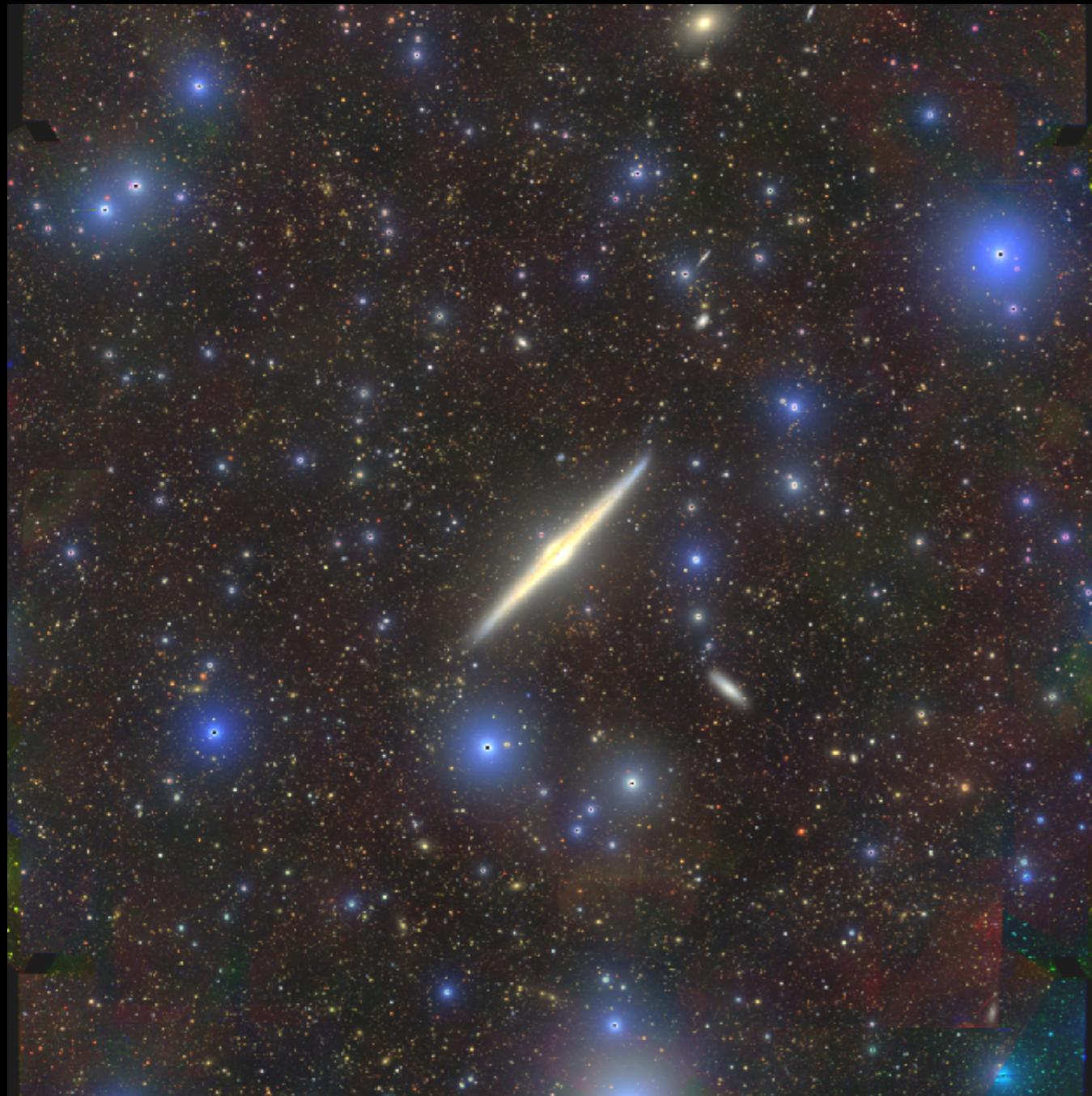
$g \sim 30.5$ mag/arcsec 2
 $r \sim 29.9$ mag/arcsec 2
 $i \sim 29.3$ mag/arcsec 2

~1 °

1-sigma $30'' \times 30''$ arcsec 2 boxes

$g \sim 32.9$ mag/arcsec 2
 $r \sim 32.3$ mag/arcsec 2
 $i \sim 31.7$ mag/arcsec 2

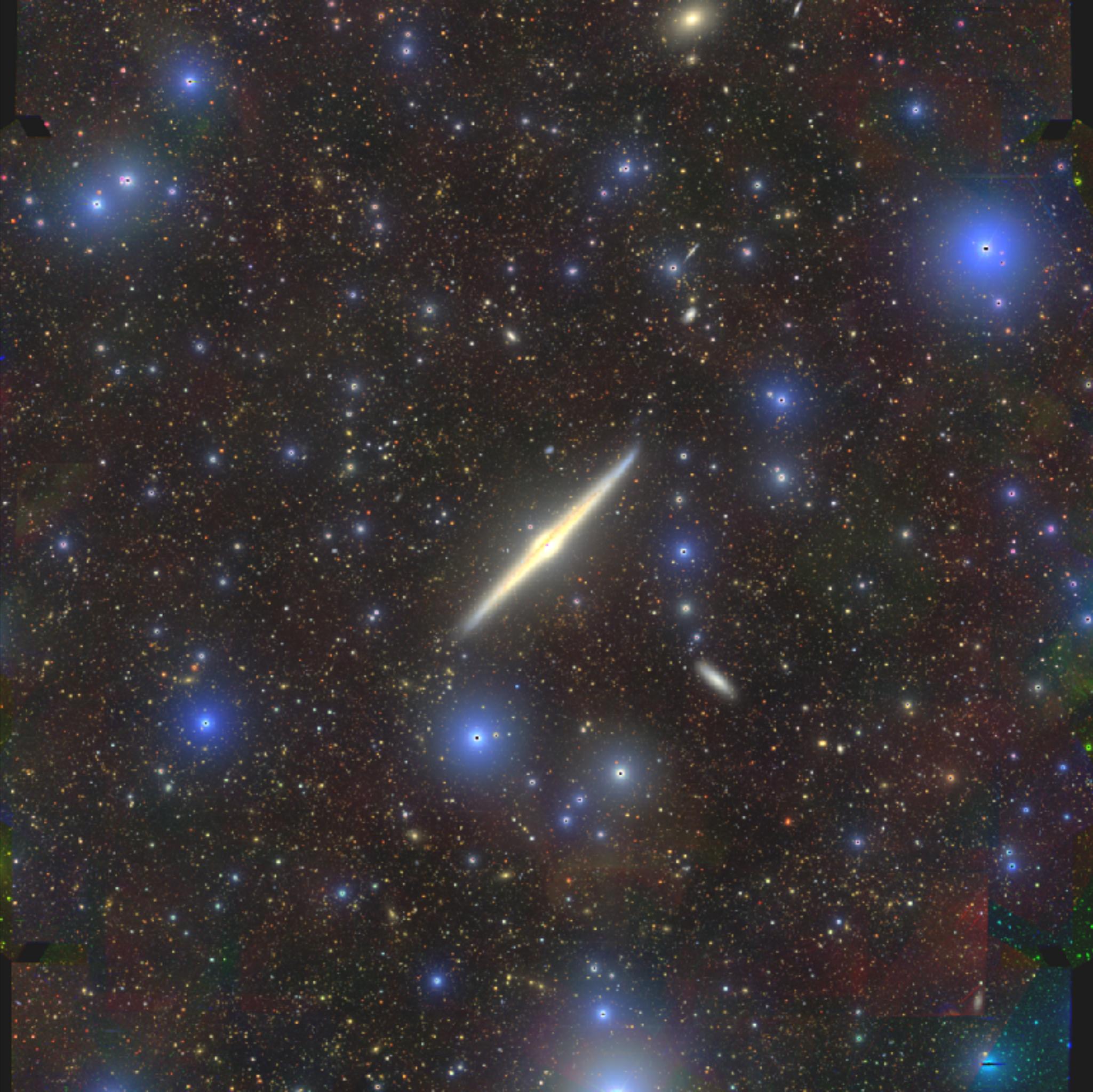
**NGC4565 color image
(g+r+i)**



**Scatter light field
(stars g-mag < 16 mag)**



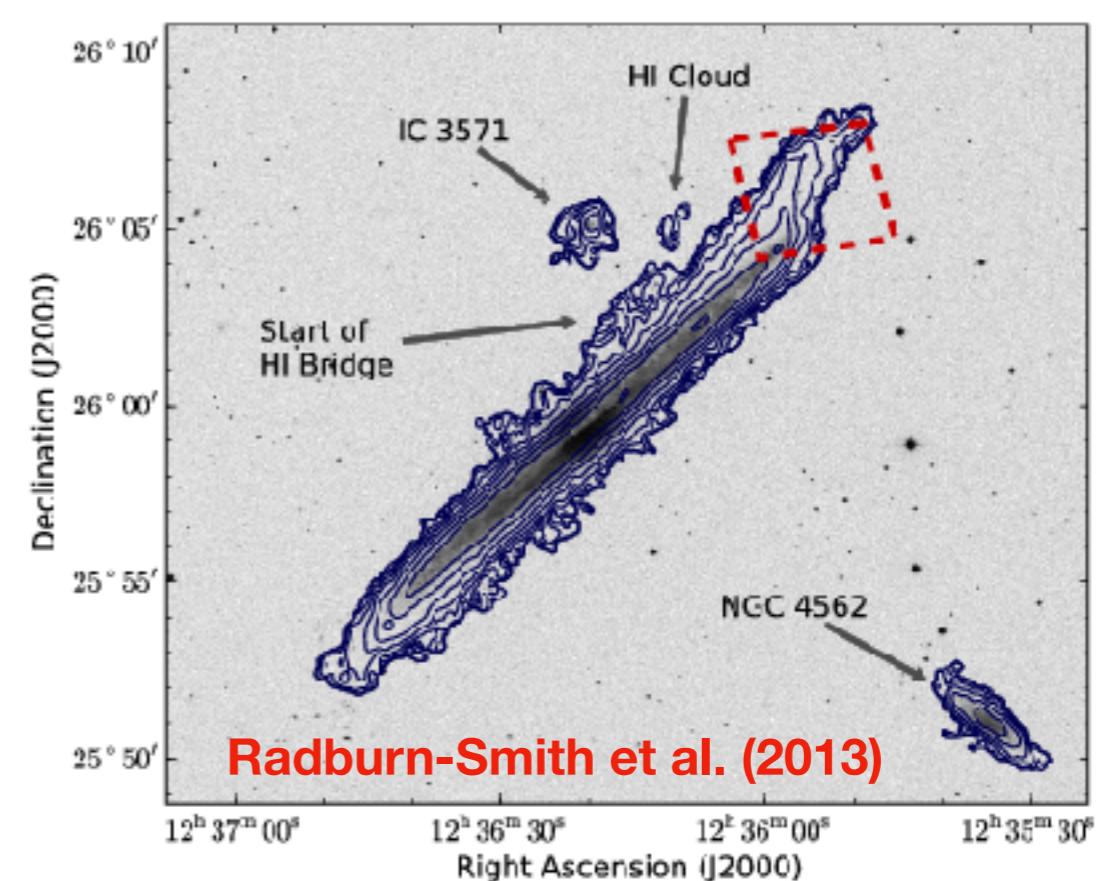
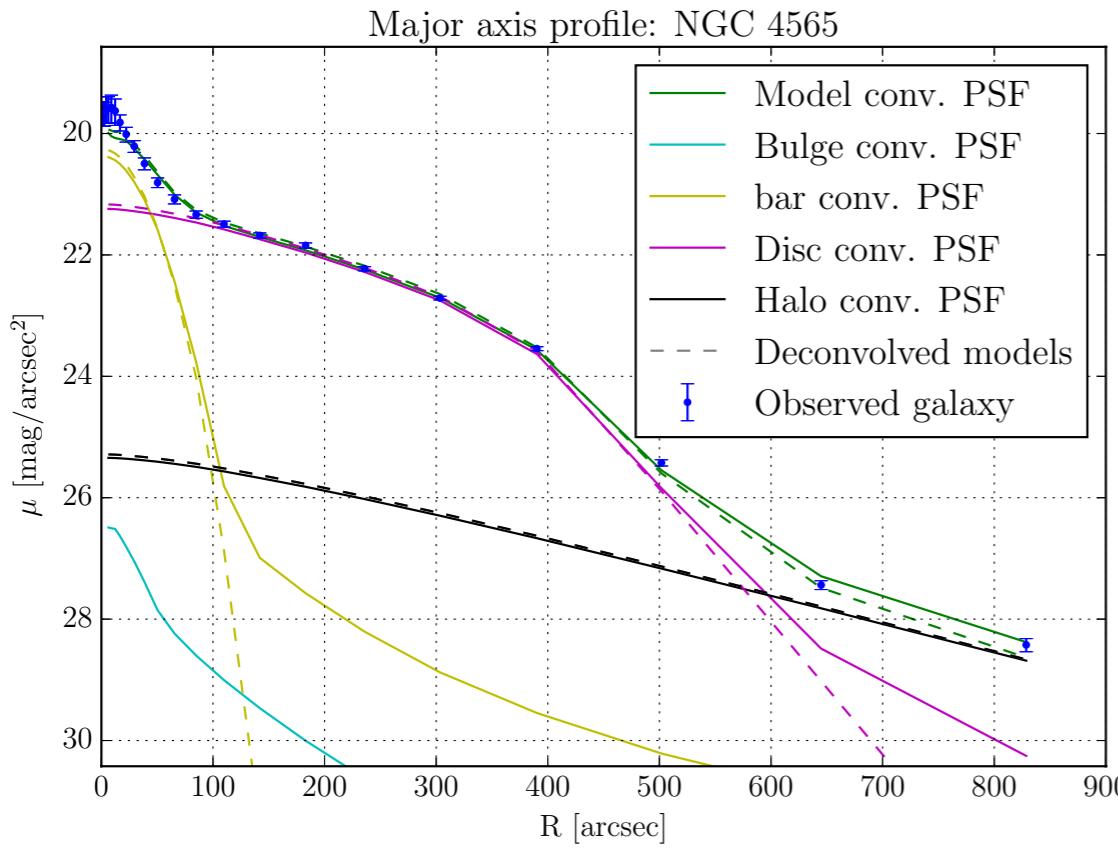
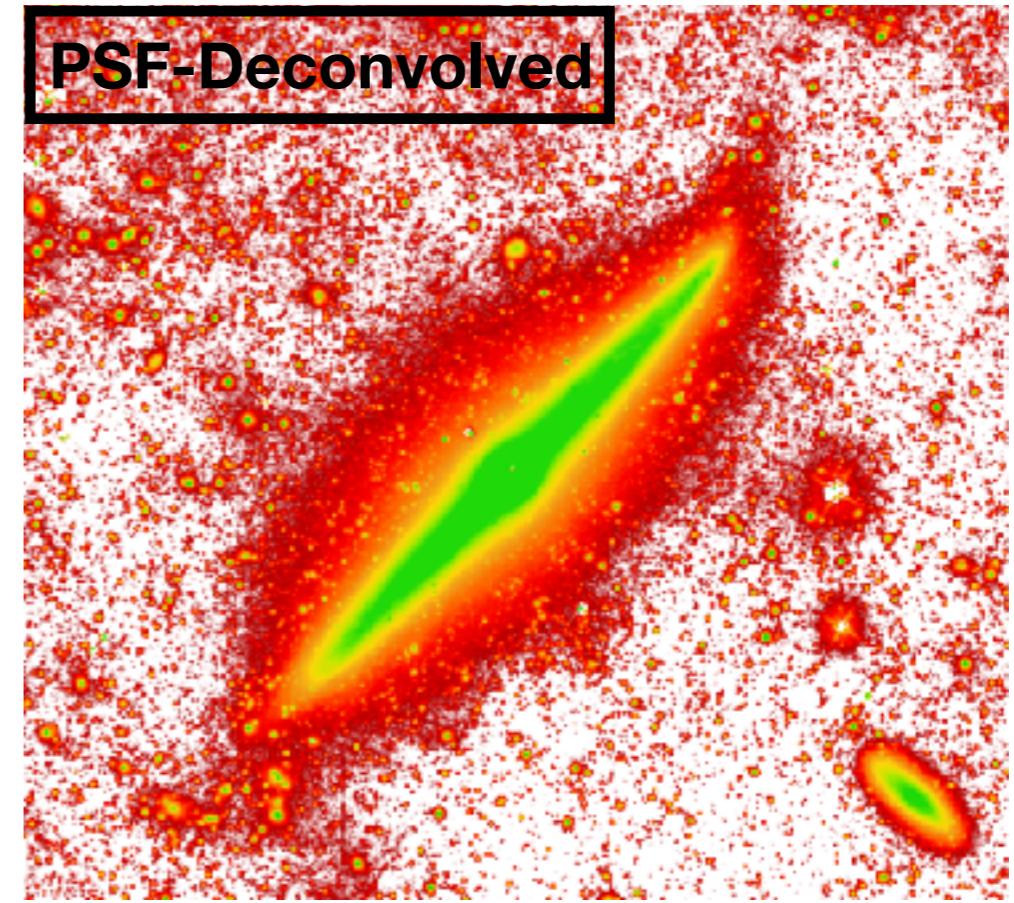
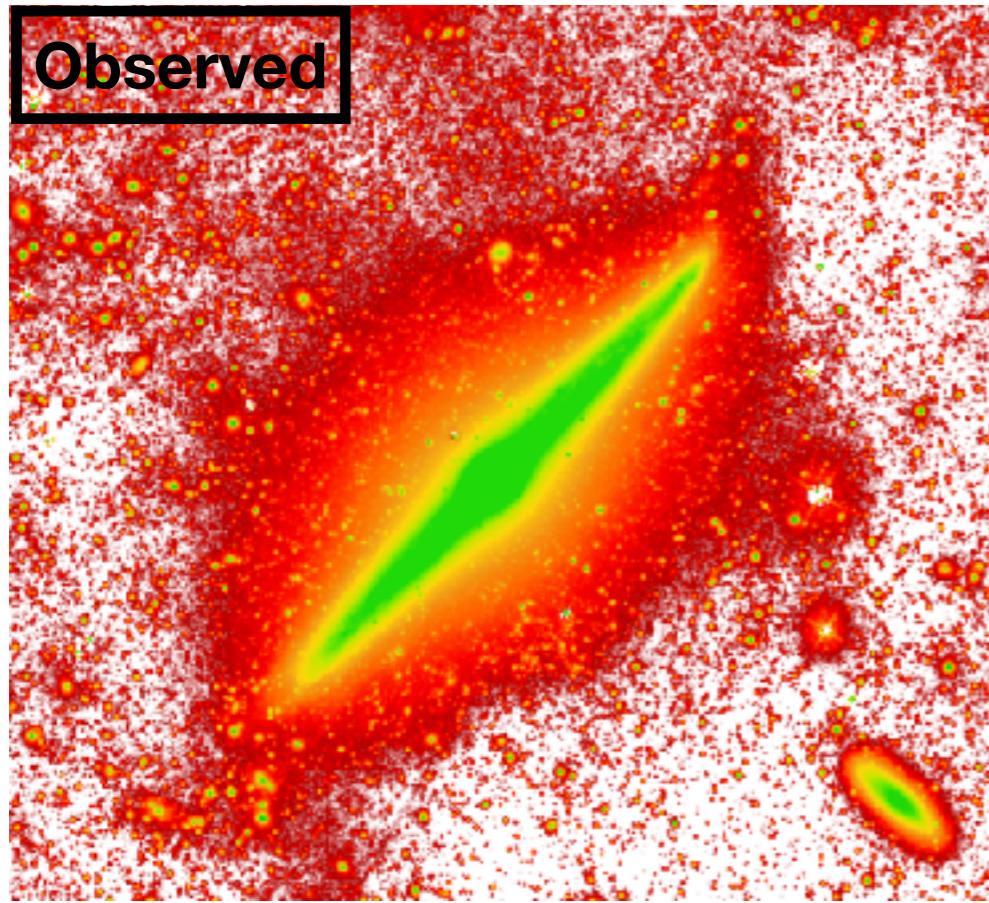
**STARS
ON**



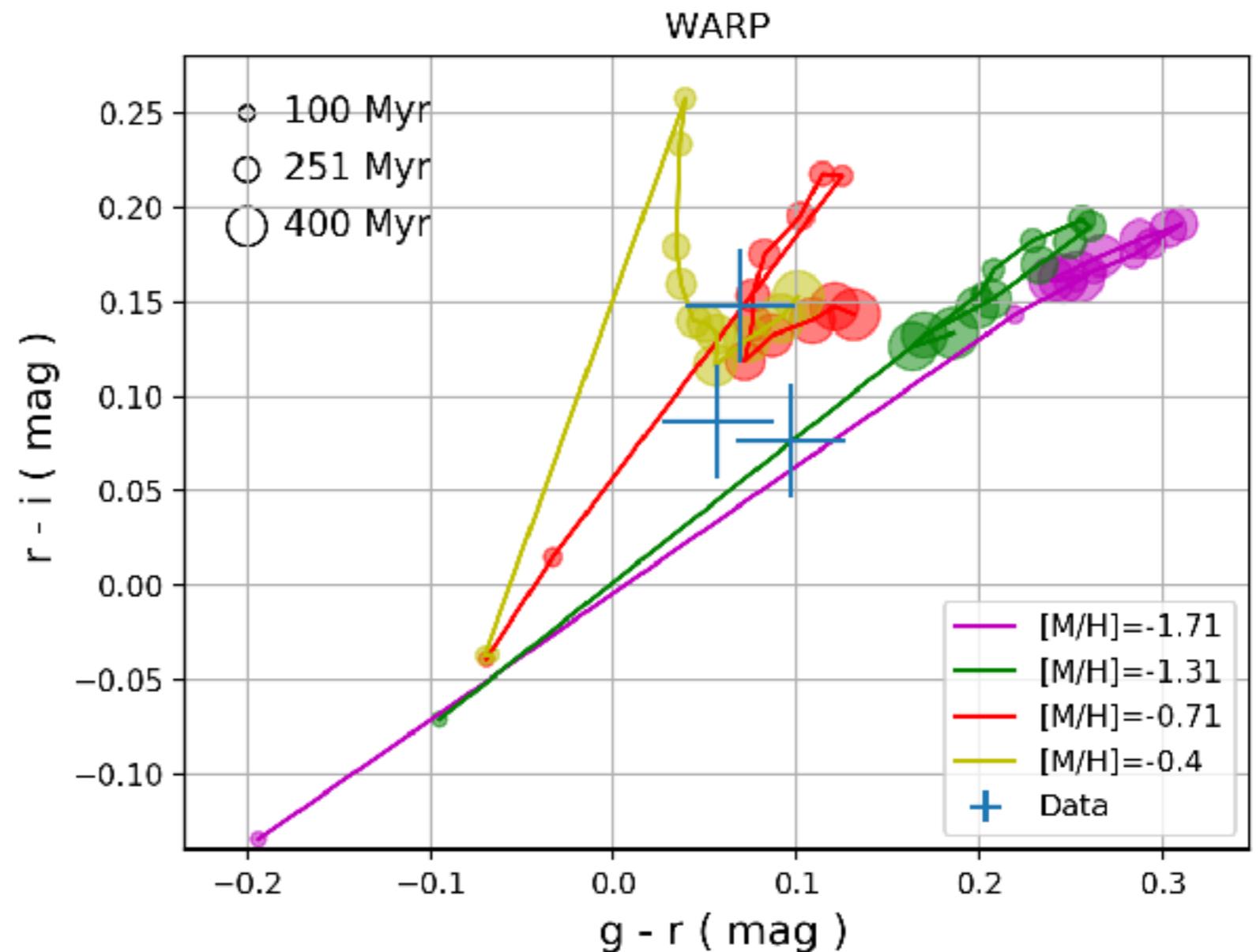
**STARS
OFF**



Modeling NGC4565 (r-band)



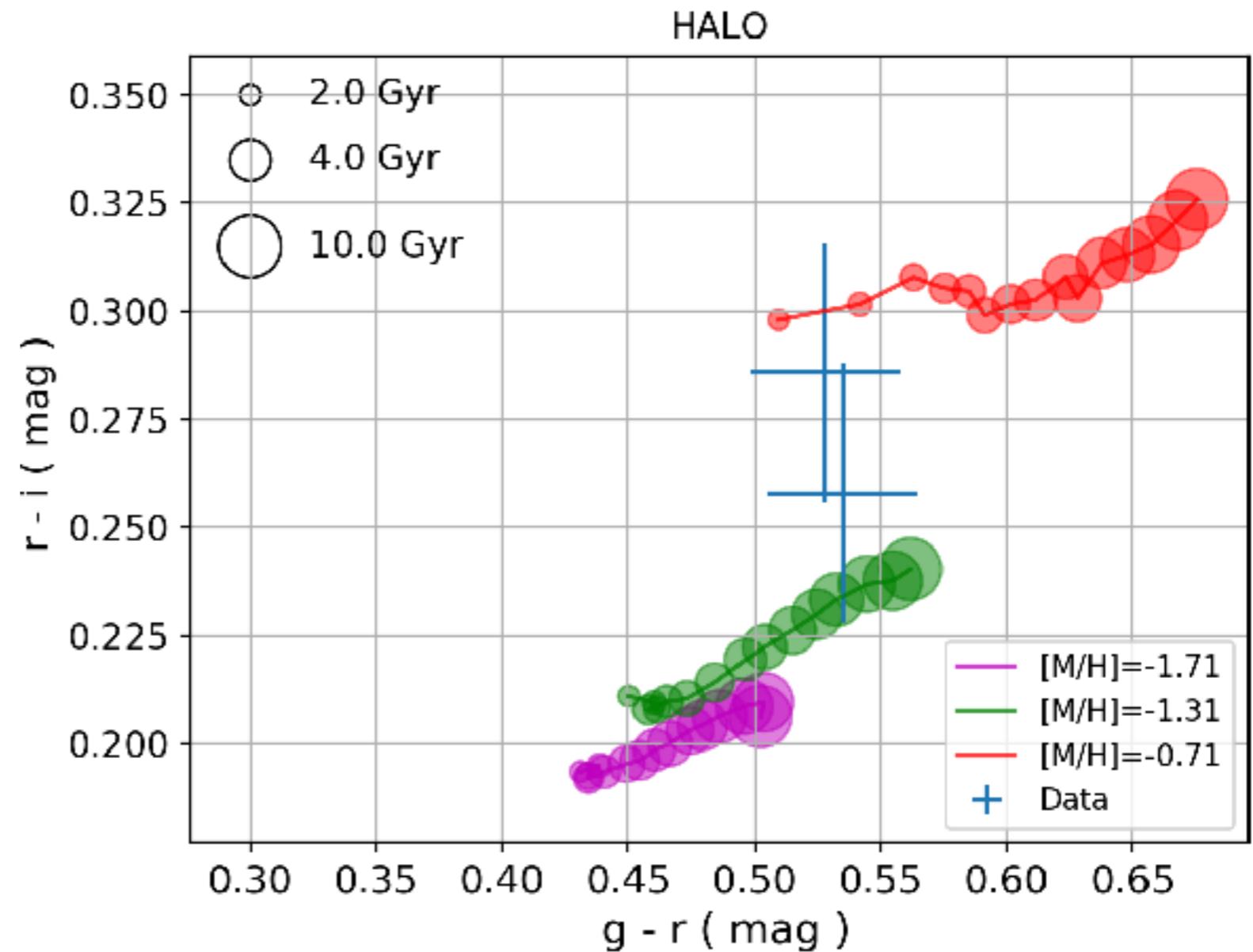
WARP



We found a **young** (ages between 100 and 400 Myr) and **metal poor** structure ($[M/H]$ between -1.71 and -0.4).

Radburn-Smith et al. (2013) found similar values: age < 600 Myr and $[M/H] \sim -1$.

HALO



For the halo region we found ages between 2.0 and 10.0 Gyr, and metalicities $[M/H]$ between -1.31 and -0.71.

Monachesi et al. (2016) obtained age ~ 10 Gyr and $[M/H] \sim -1.2$ using star counting techniques.

Conclusions

- With these **preliminary** results we can say that counting star and deep integrated photometry techniques are in agreement.
- This allows us to use integrated photometry where star counting technique is unfeasible.