

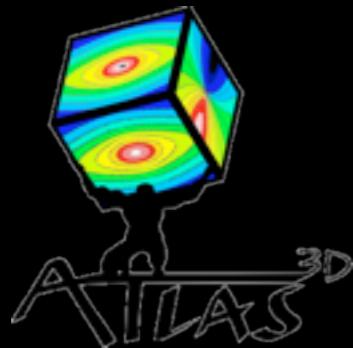


Pierre-Alain Duc



Extended stellar structures in the Virgo cluster of galaxies

E. Ferriere
S. Paudel



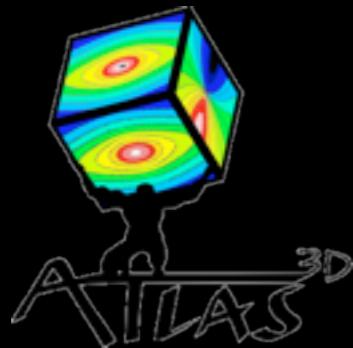


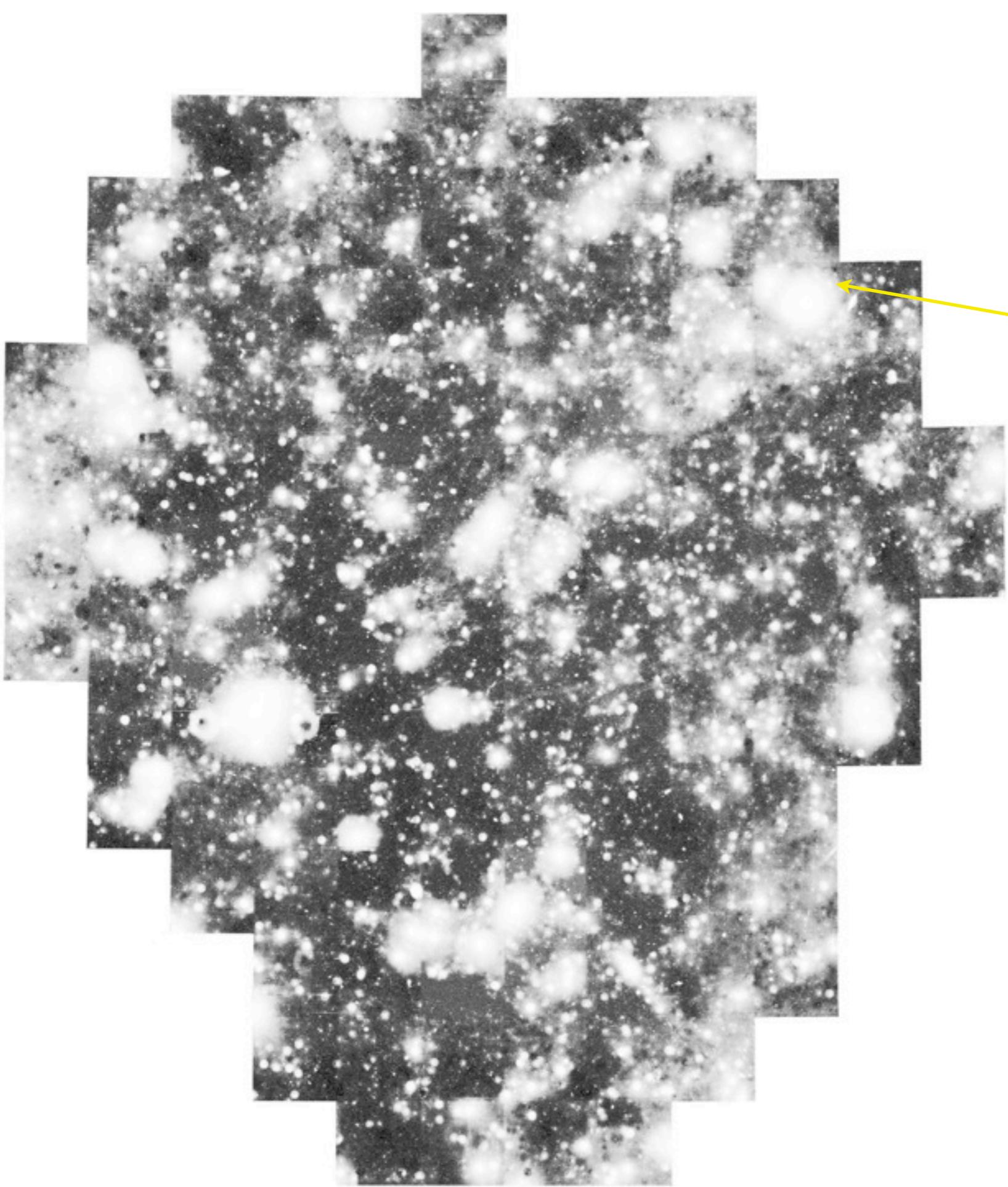
Pierre-Alain Duc



How extremely deep images (with MegaCam) change our view of galaxies and clusters

E. Ferriere
S. Paudel



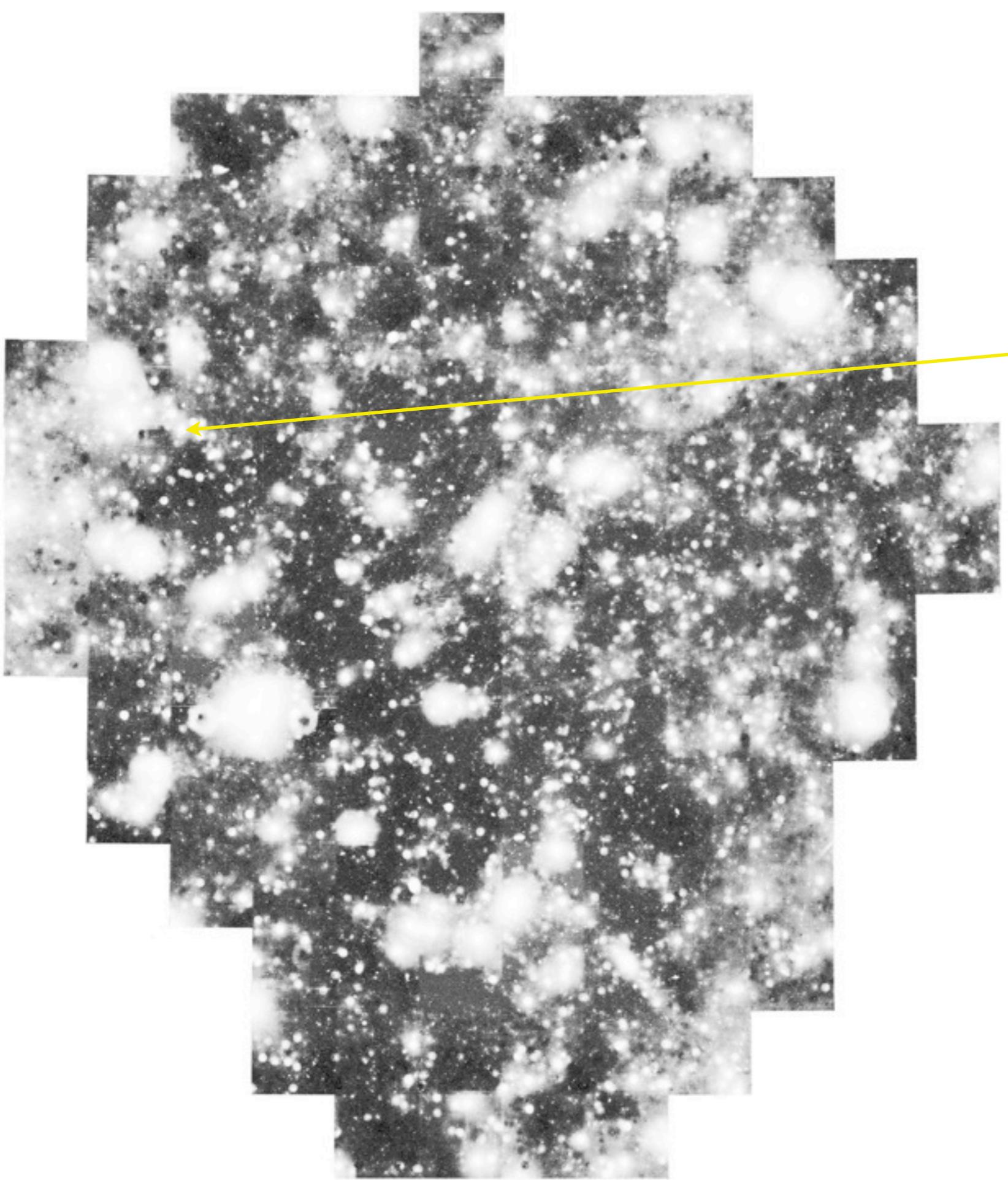


- The Virgo cluster at $29 \text{ mag/arcsec}^{-2}$
- Halos of bright stars*



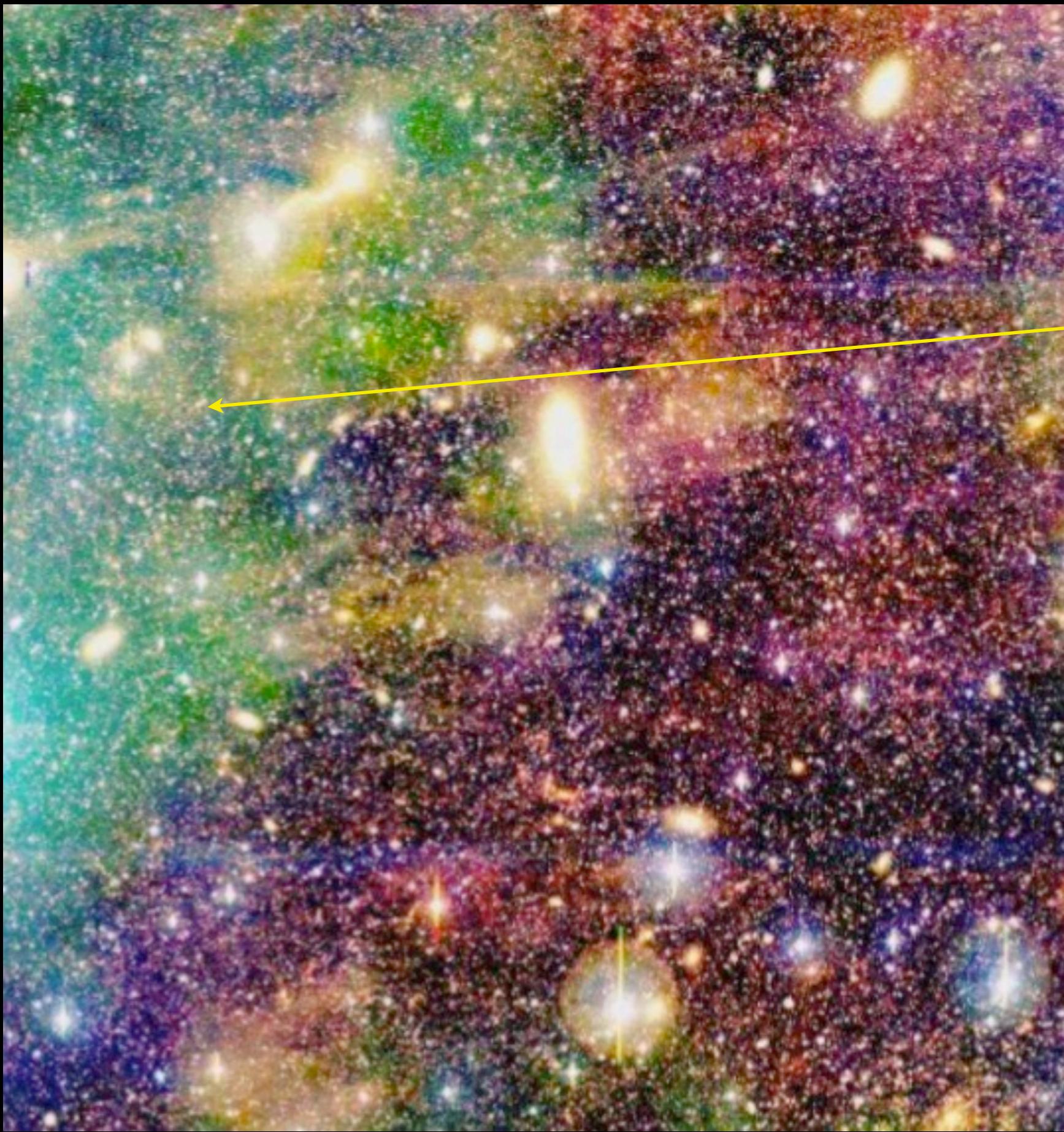
Halos of bright stars

Halos of galactic nuclei

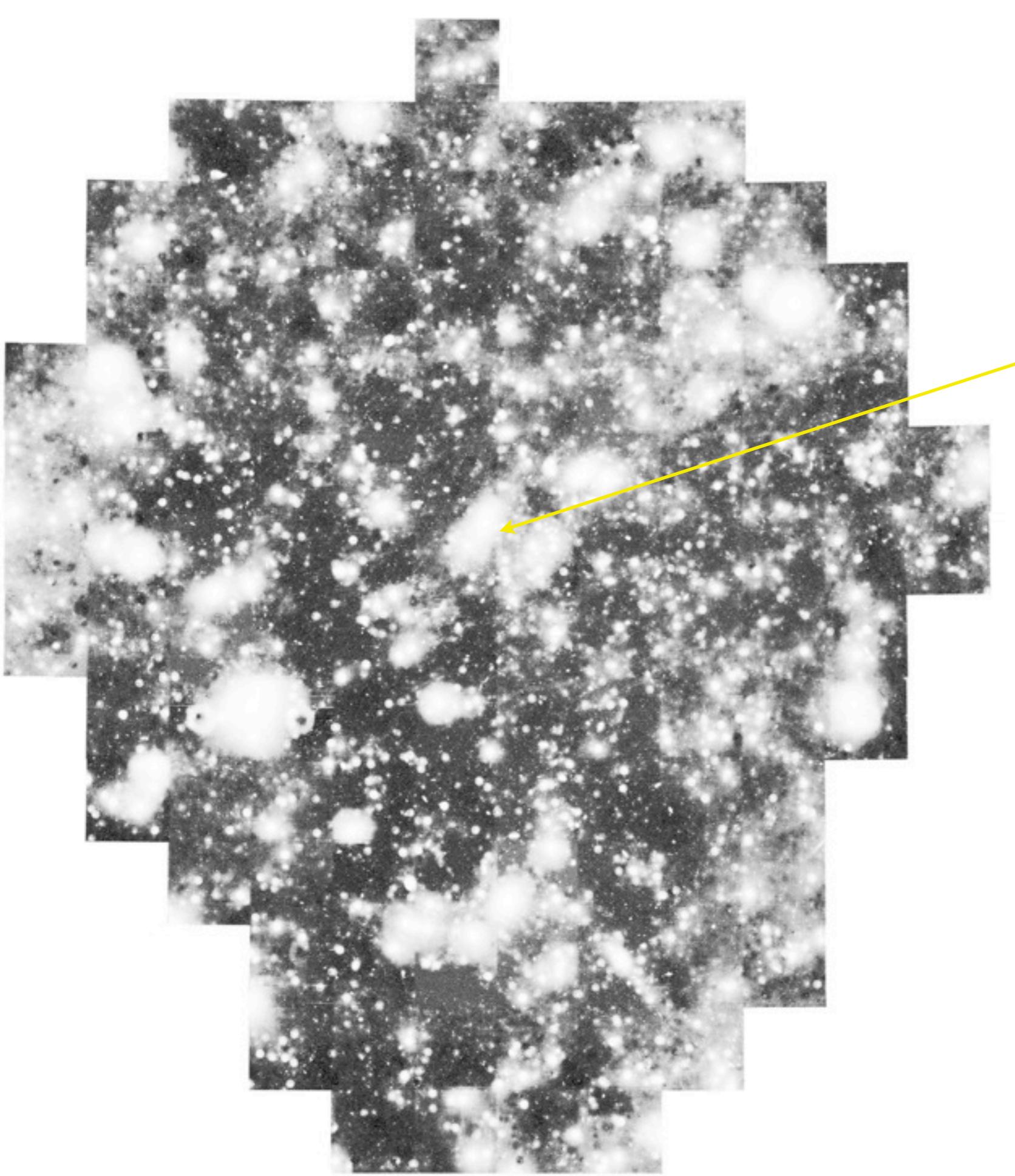


- The Virgo cluster at $29 \text{ mag/arcsec}^{-2}$

Galactic cirrus



Galactic cirrus



- The Virgo cluster at $29 \text{ mag/arcsec}^{-2}$

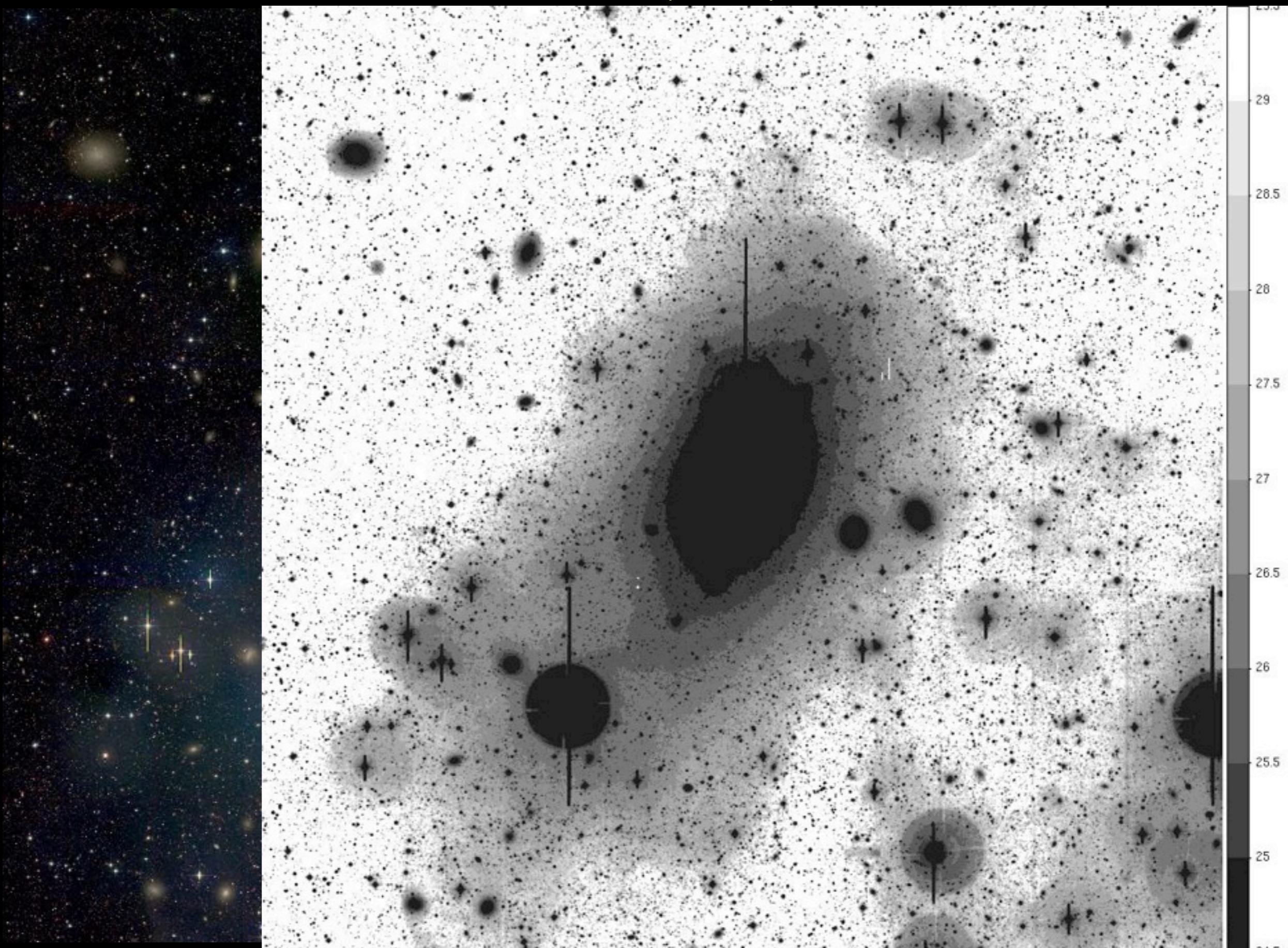
The intracluster light?

Expected to correspond to about 20% of the stellar content of clusters

M87 (SDSS)



M87 (NGVS)

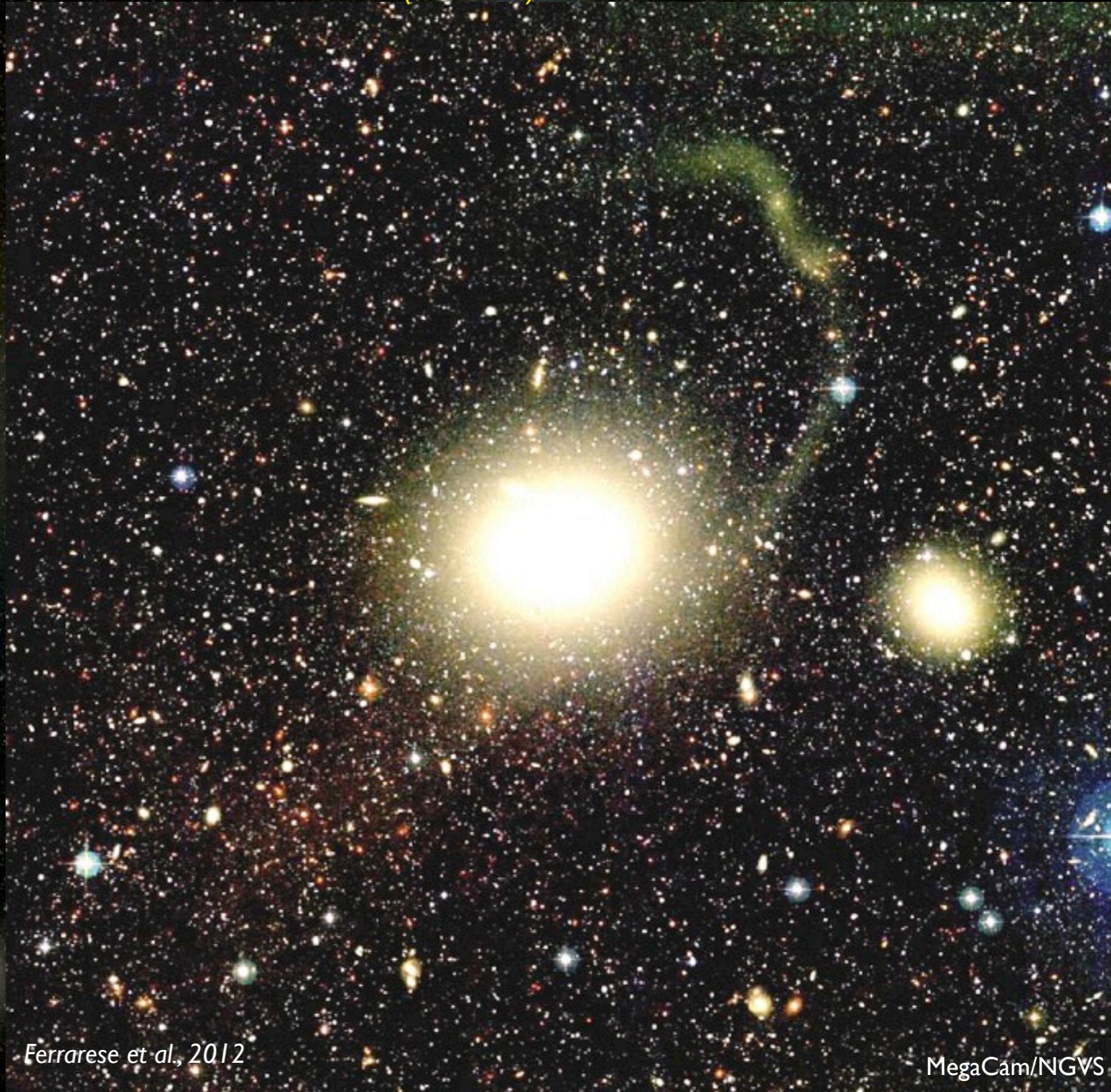


Extended stellar halos

M60-M59-NGC4660 (SDSS)



M60-M59-NGC4660 (NGVS)



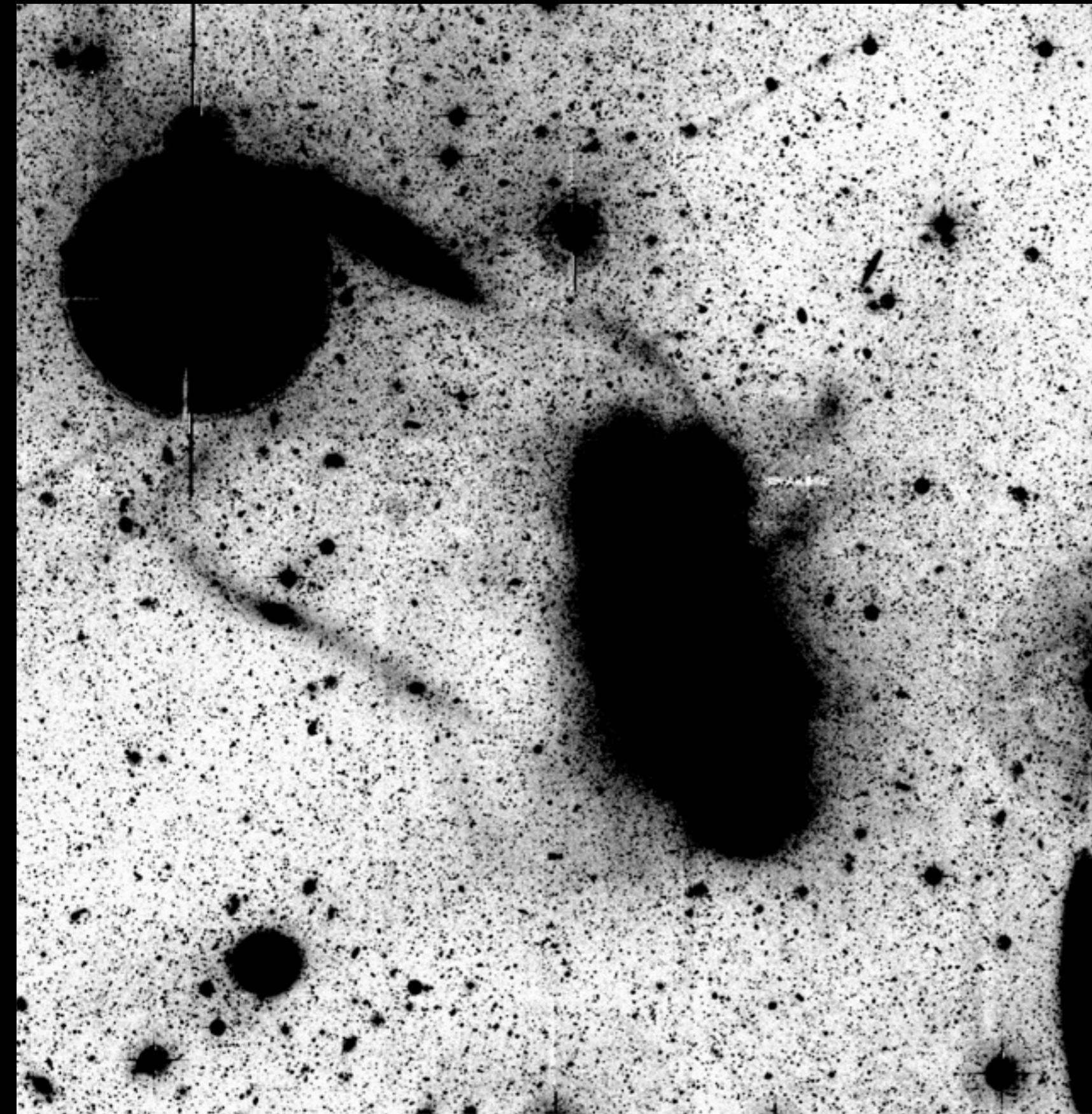
Ferrarese et al., 2012

MegaCam/NGVS

Stream from disrupted satellite



Paudel et al., 2012



**Series of narrow
stellar filaments**



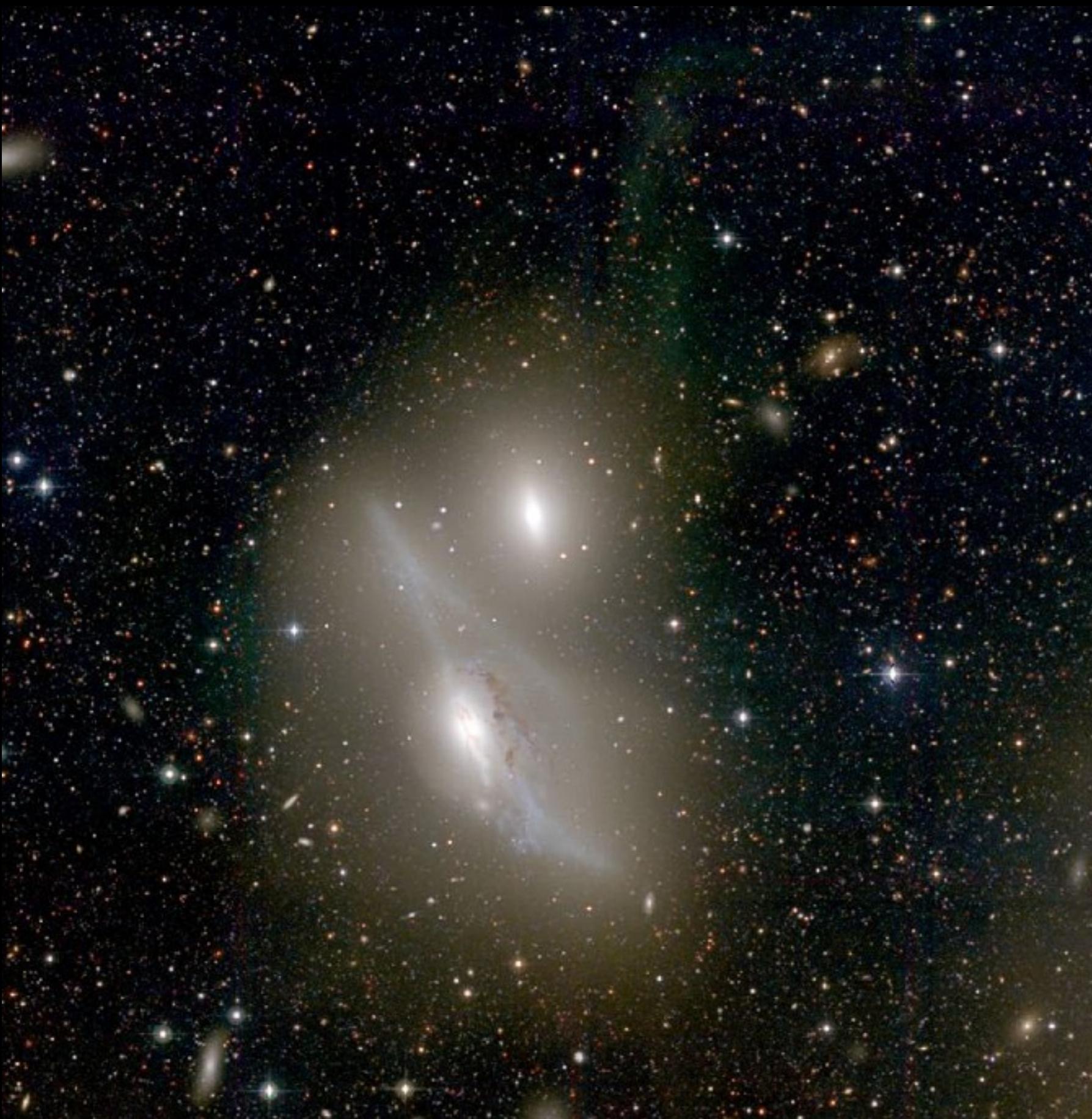
Satellites wrapping
around wrapping
satellite

M89 (NGVS)



Shells from minor mergers

NGC 4435/38 (NGVS)



Tidal tails of major
collisions

HI stream from NGC 4388



Ferriere et al, 2012

Ram-pressure stripped gas

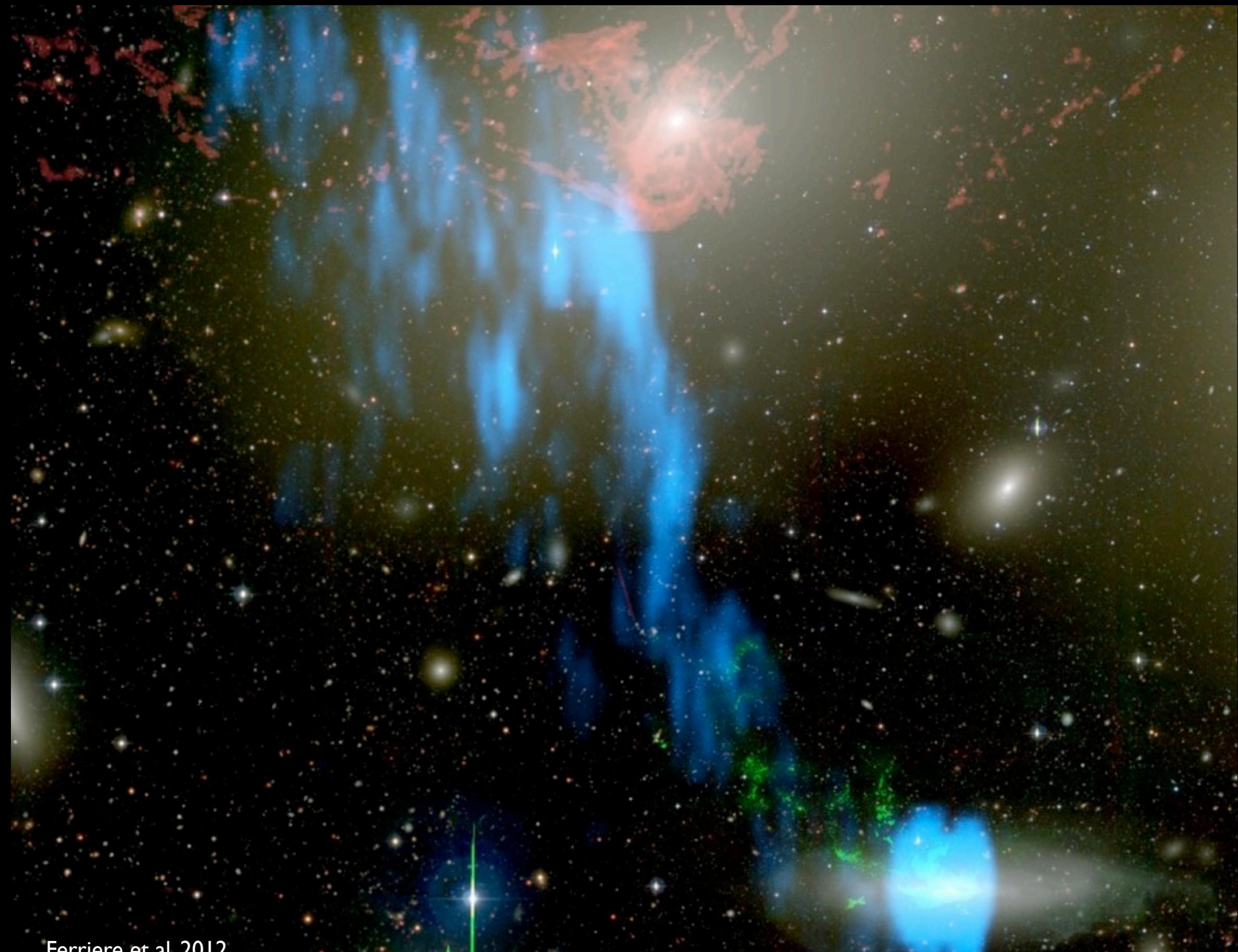
NGC 4388



Ferriere et al, 2012

No diffuse optical counterpart: ram-pressure stripped gas

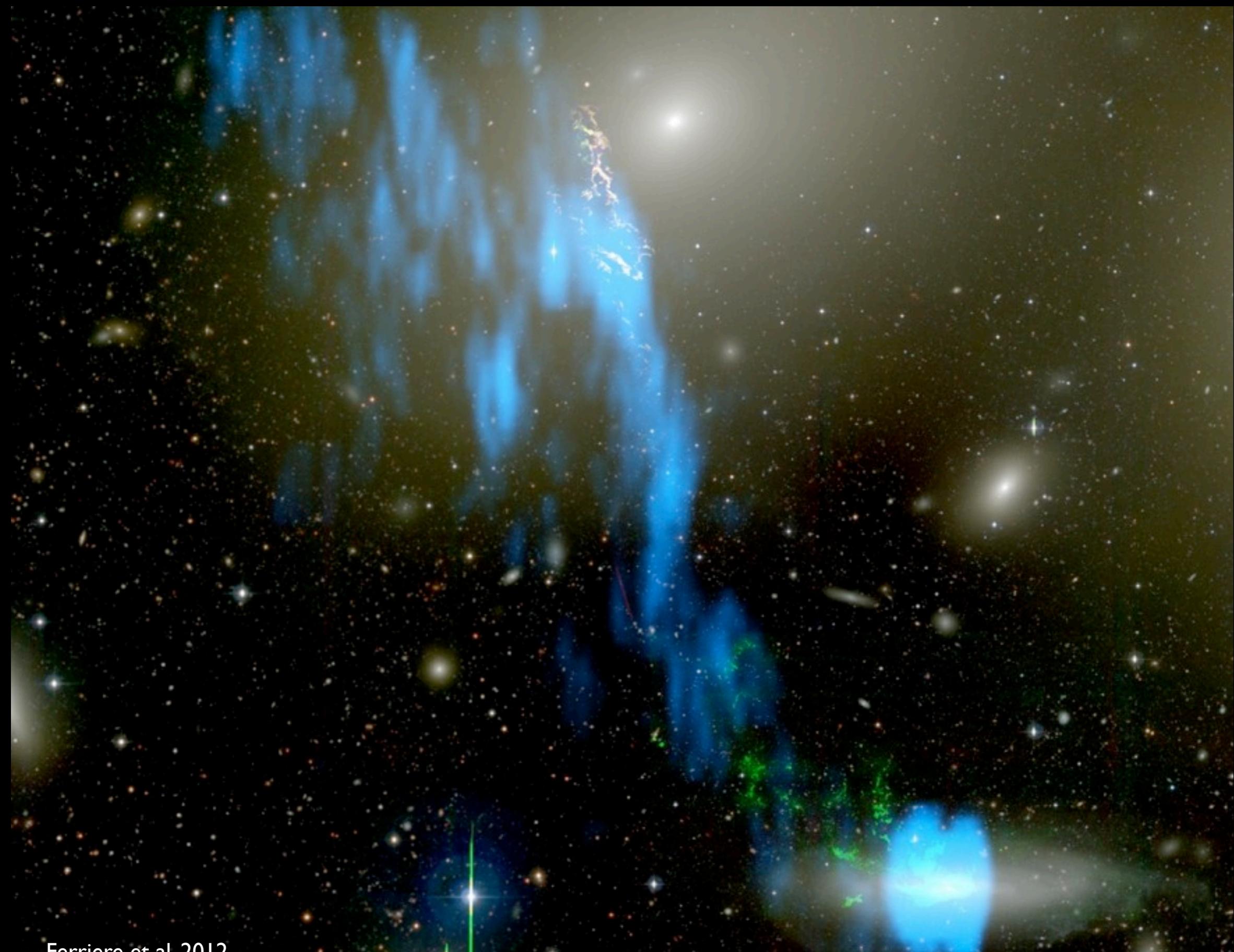
HI + Halpha on NGVS



Ferriere et al, 2012

Low level star-formation at the base of the tail

HI + dust lanes on NGVS



Ferriere et al, 2012

Dust lanes seen towards the HI stream: the gas is dusty!

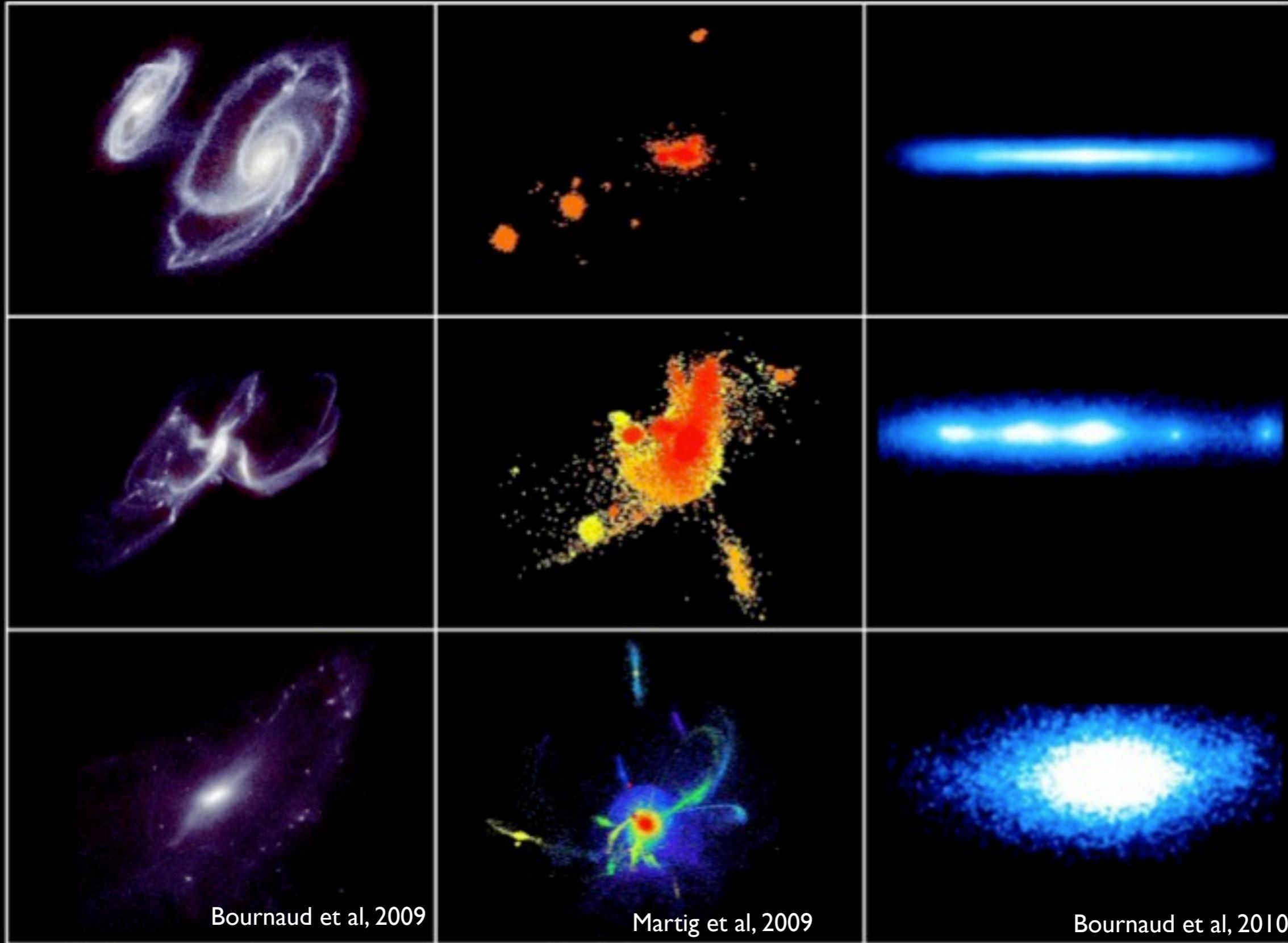
HI + Halpha+ dust lanes + Herschel/FIR on NGVS



Ferriere et al, 2012

Dust seen in absorption and emission do not match

Probing the mass assembly of galaxies

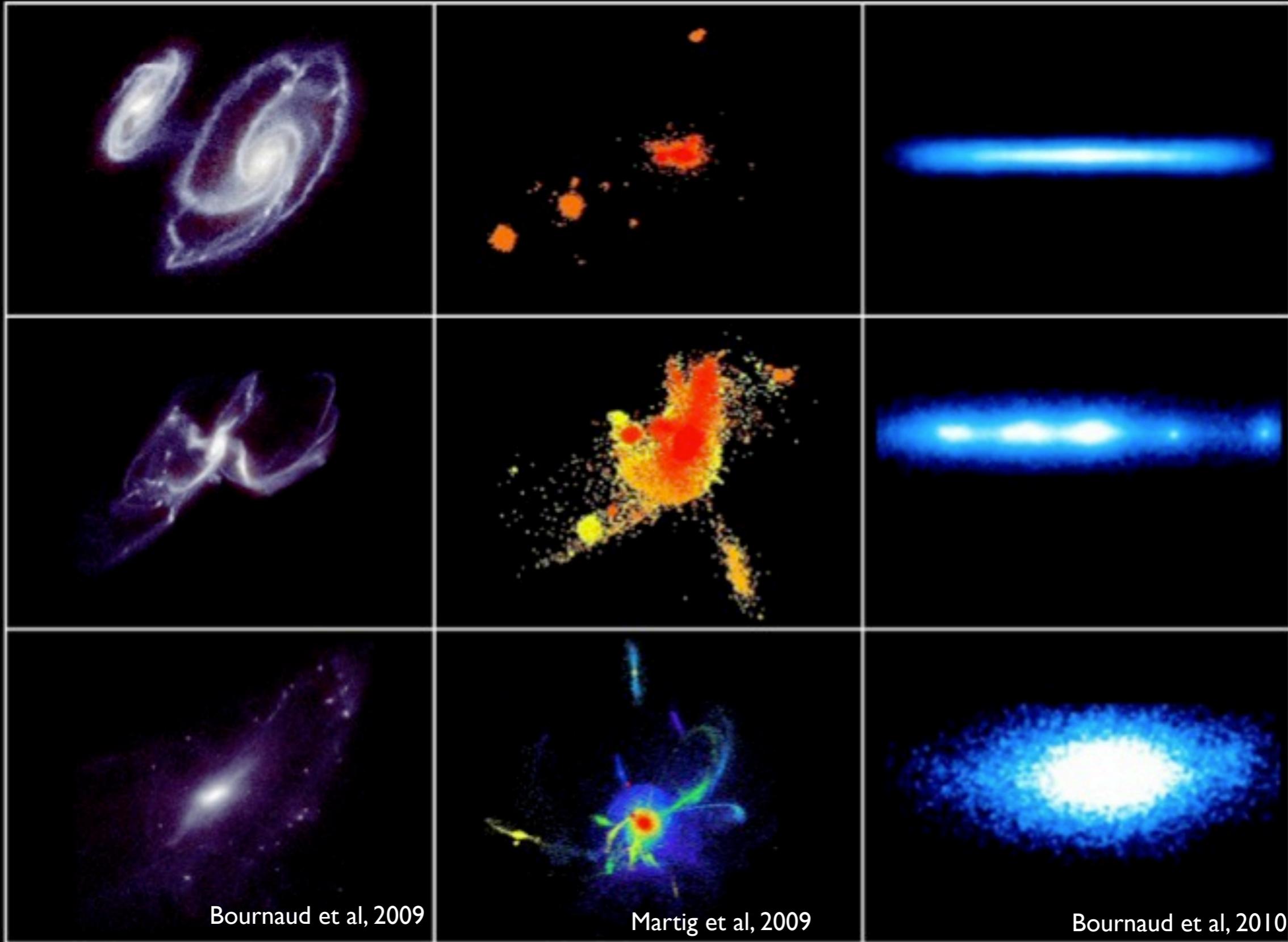


Recent major merger

A complex merger history

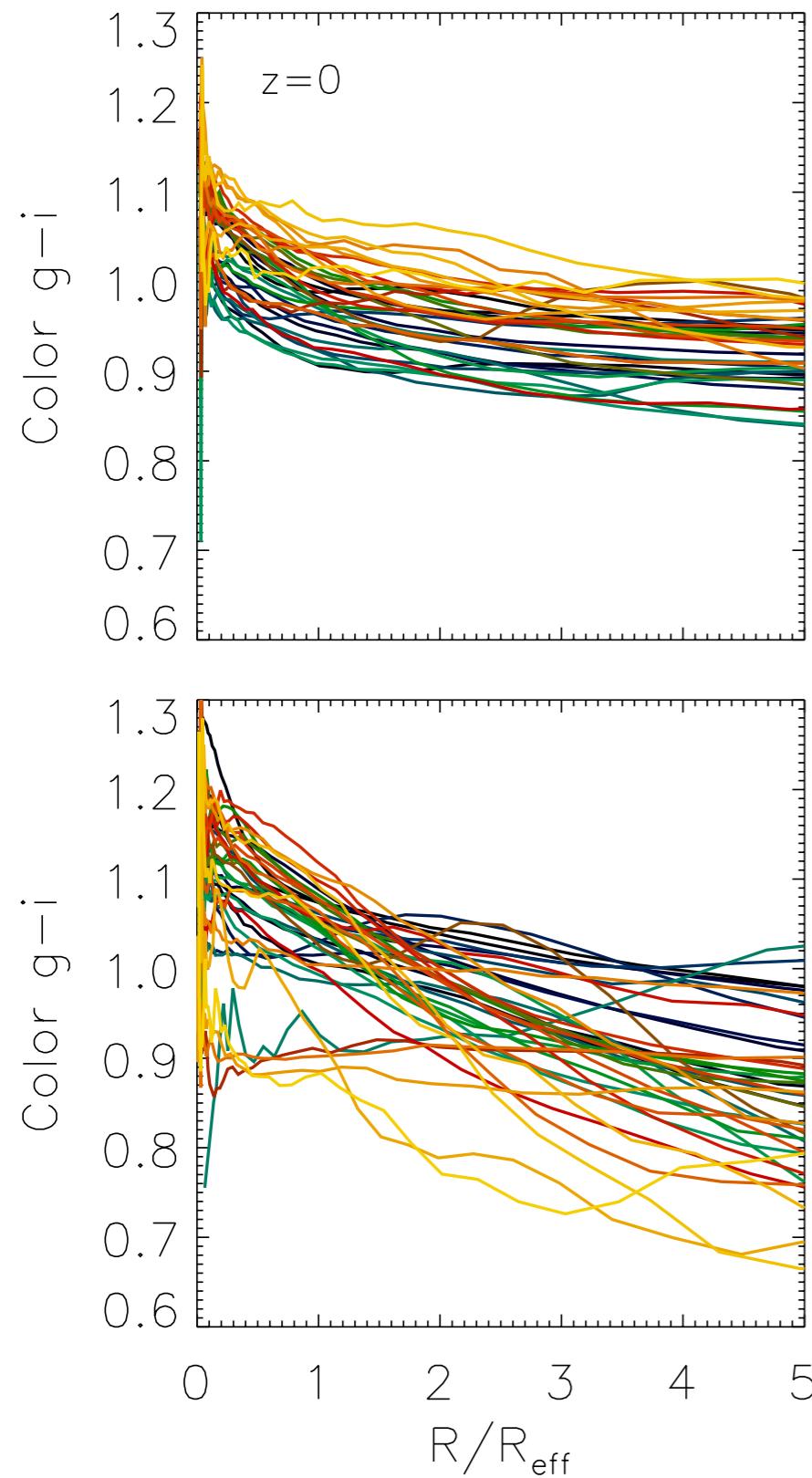
Secular evolution

Probing the mass assembly of galaxies with deep imaging



Each scenario forms a central ETG, but very different stellar (low surface brightness) fine structures in the outskirts, which may now be probed

Probing the mass assembly of galaxies with deep imaging

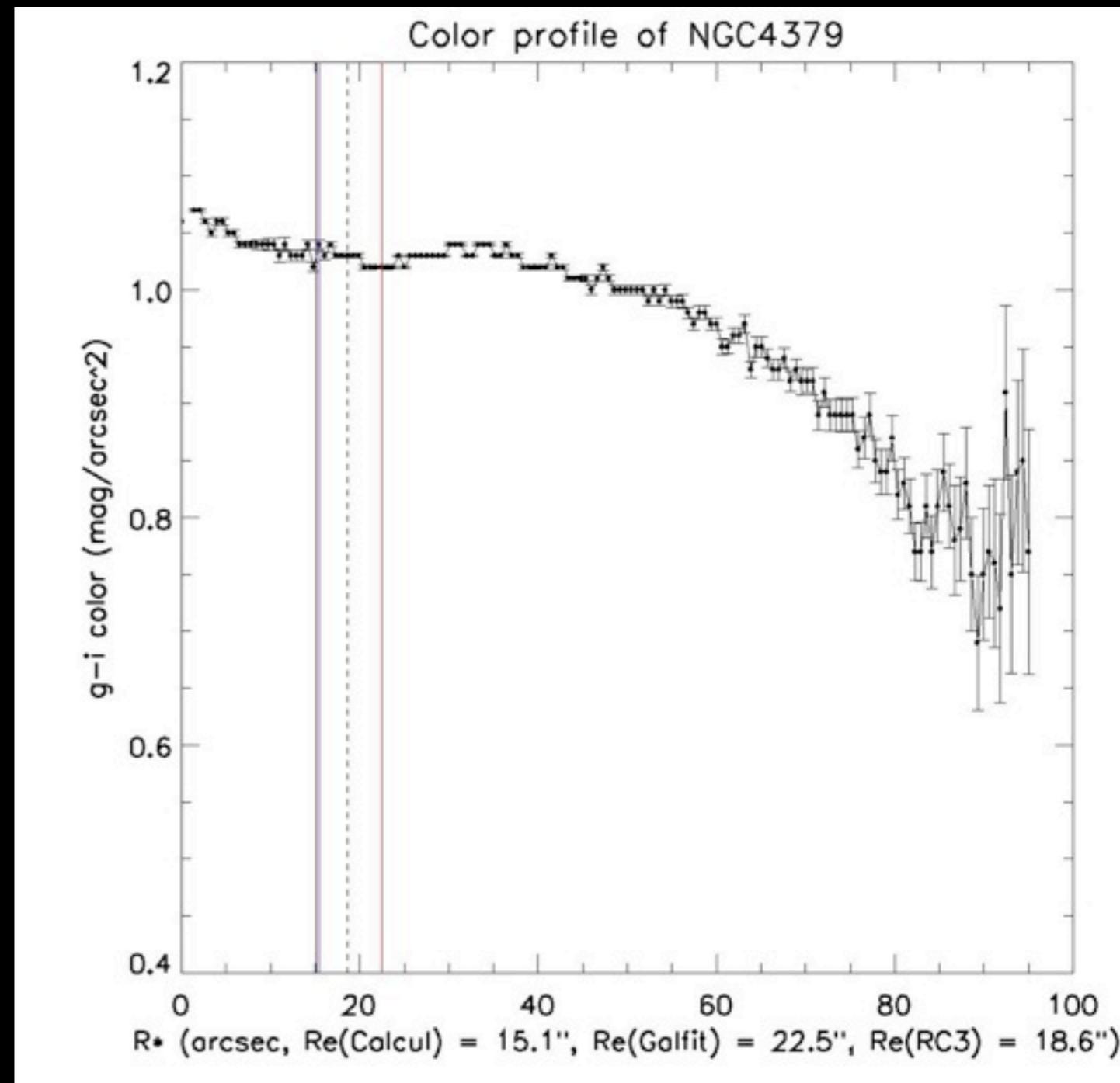


Cosmological and idealized simulations
give further constraints

- Size of the effective radius
- Color gradients in the very outskirts of galaxies

which may be checked with deep images of
nearby galaxies

Observed NGVS luminosity and color profile



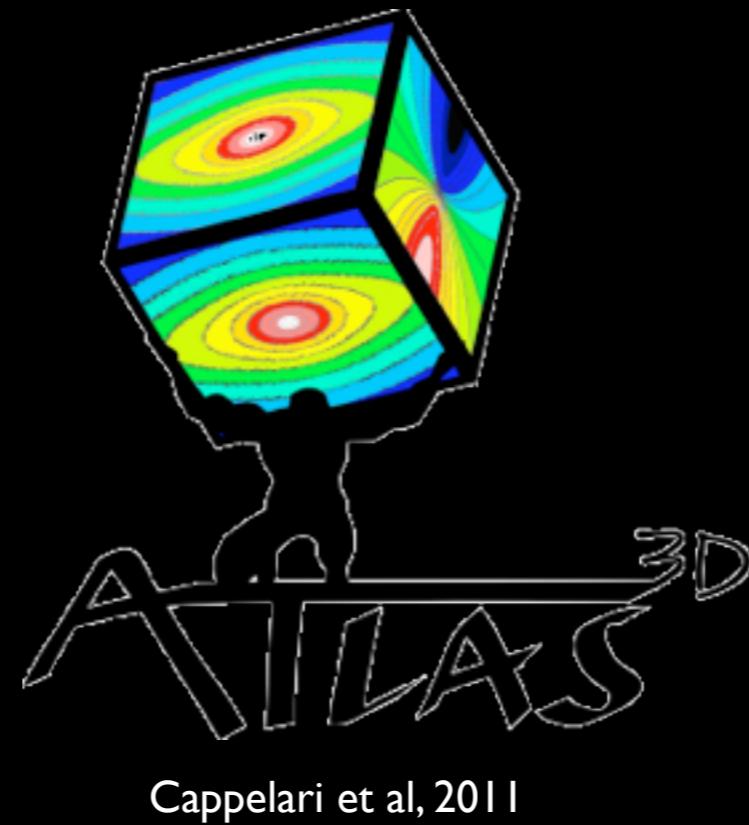
- Revision of the effective radius
- Measure of colors possible up to 5 Reff

Ferriere et al, 2012

Probing the Mass Assembly of Galaxies



Ferriere et al, 2012



Cappelari et al, 2011

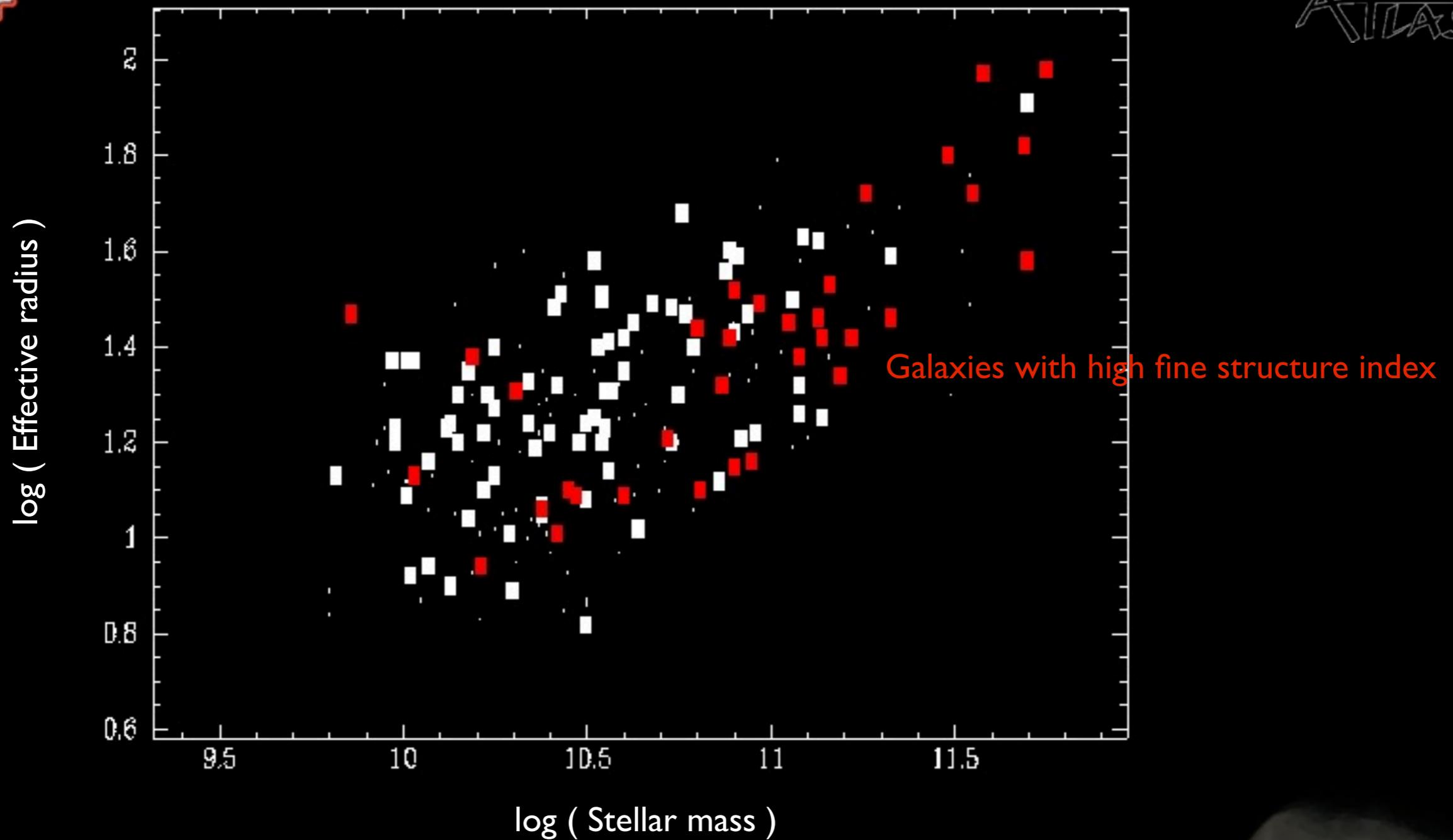
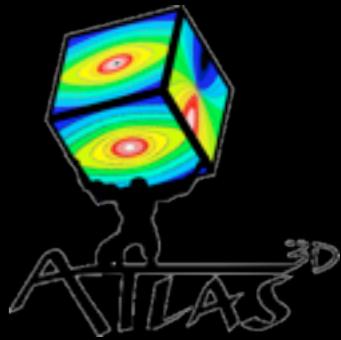
A sample of 260 ETGs (inside and outside Virgo)
with a wealth of multi-wavelength data

Duc et al, 2012





Probing the Mass Assembly of Galaxies



- Observations to be completed
- Massive and more extended galaxies are more tidally perturbed
- The fine structure index varies with the environment





CFHT 2012 calendar w. Coleum



CFHT 2012 calendar w. Coleum