The Local Volume HI Survey (LVHIS)

Bärbel Koribalski
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Australia Telescope National Facility
"Gas in Galaxies" – Kloster Seeon – June 2011

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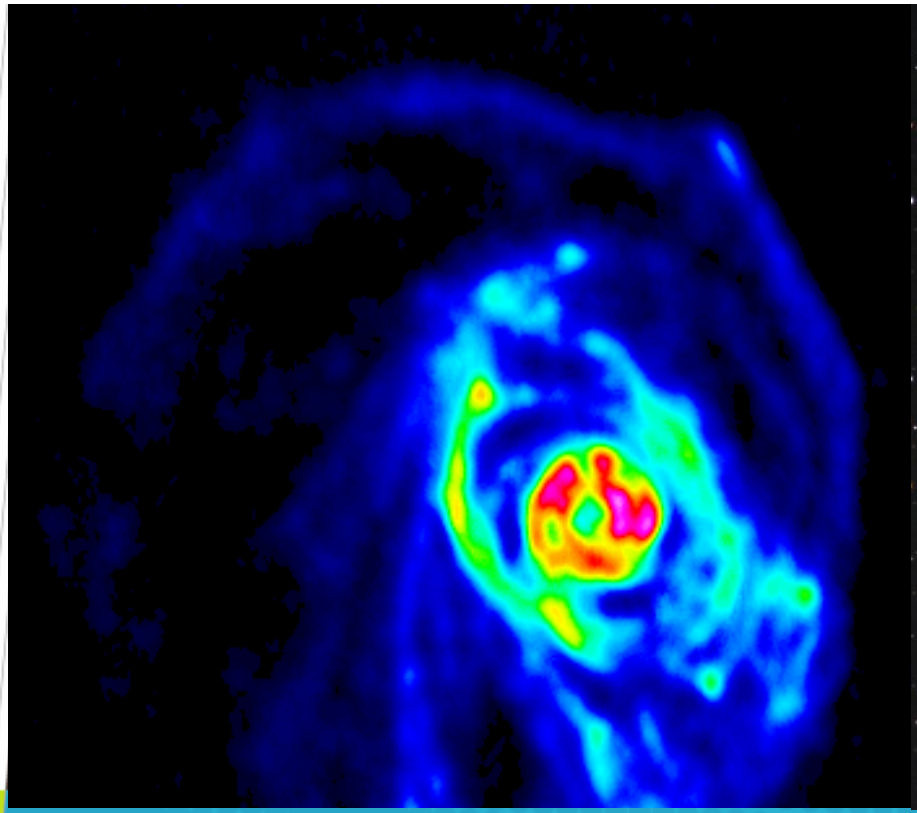

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LVHIS: tracing the *edges* of disks

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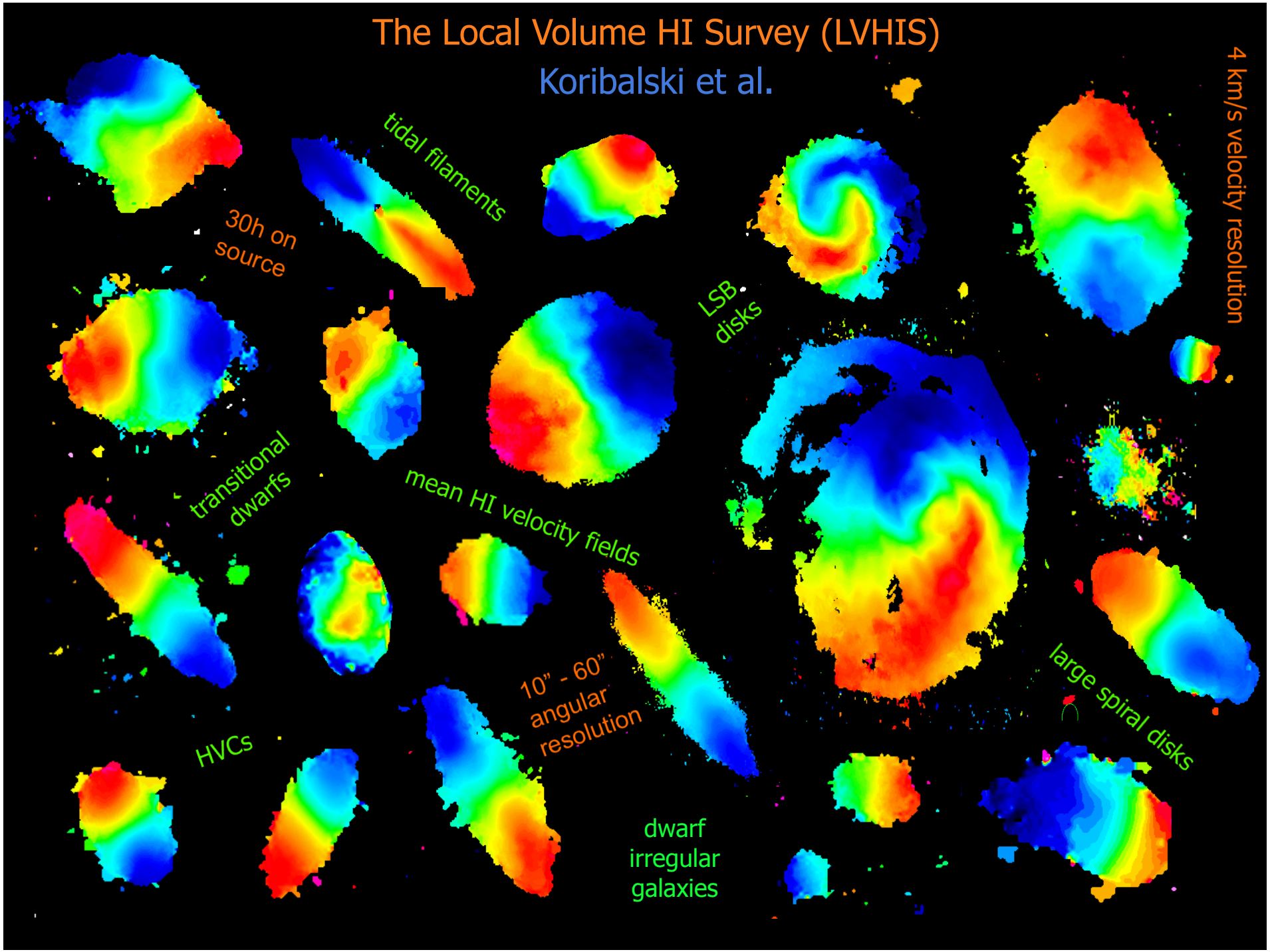

The Local Volume HI Survey (LVHIS)
Koribalski et al.
tidal filaments
30h on source
LSB disks
4 km/s velocity resolution
transitional dwarfs
mean HI velocity fields
10" - 60" angular resolution
large spiral disks
HVCs
dwarf irregular galaxies

The Local Volume (D < 10 Mpc)

Aim: a census of the LV galaxies (550+)

- study in all wavelengths (HI, CO, Hα; optical, IR, UV imaging, radio continuum, …) on all scales
- scaling relations between galaxy properties

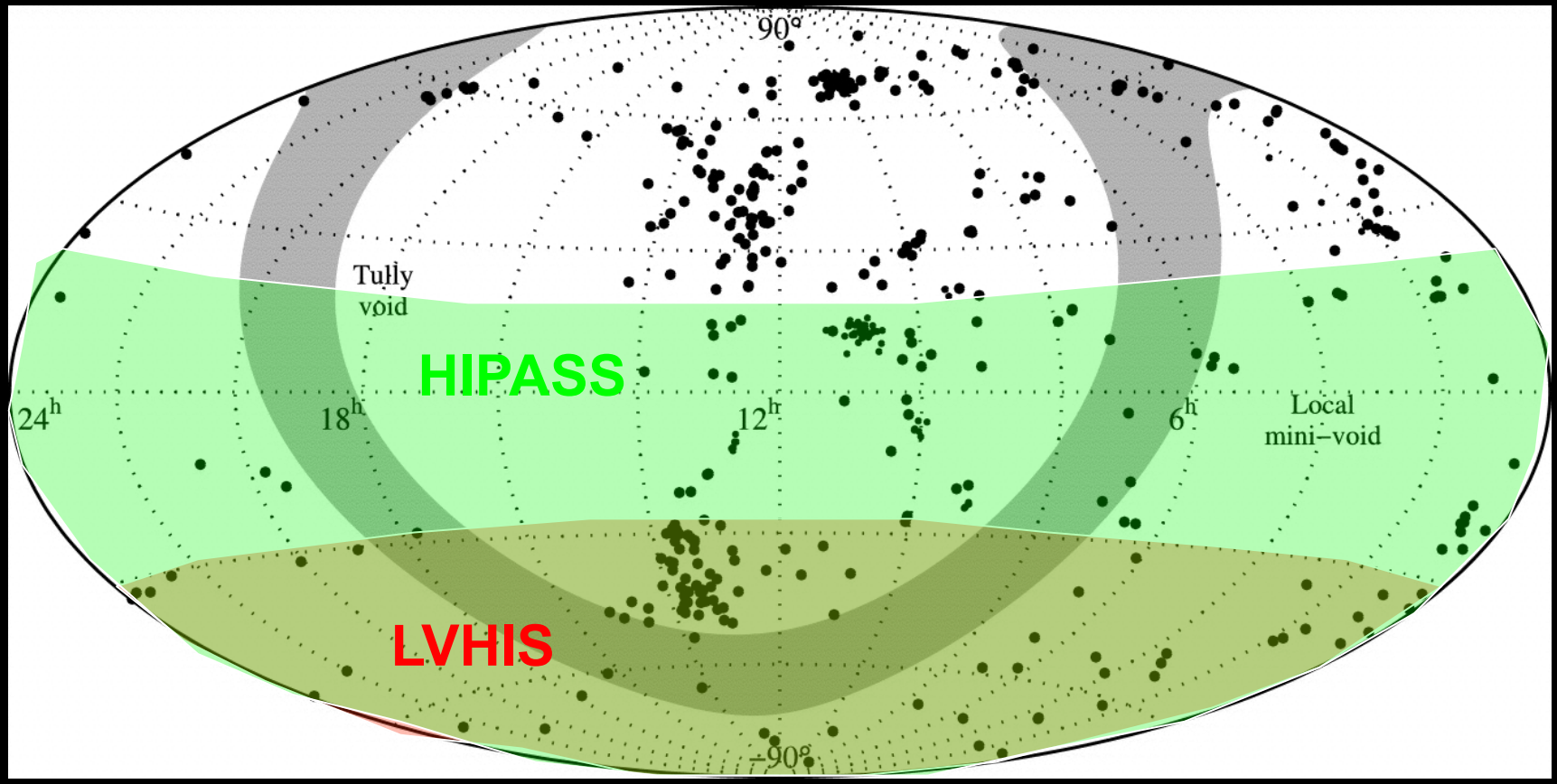
Focus: HI observations (~300+ galaxies)

- **ATCA-LVHIS (80),** THINGS (10), Little THINGS (42), FIGGS (60), VLA-ANGST (40), WHISP, WSRT-LVHIS (20+), … in future: WALLABY (1000?), …

Essential: accurate distances !

www.atnf.csiro.au / research / LVHIS

Galaxies in the Local Volume



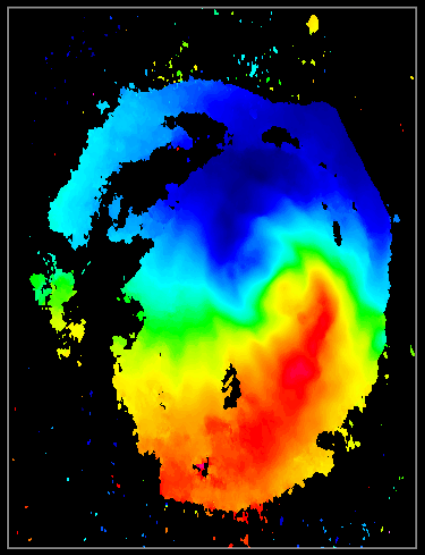
from Karachentsev et al. 2004 (based on 450 LV galaxies with D < 10 Mpc)

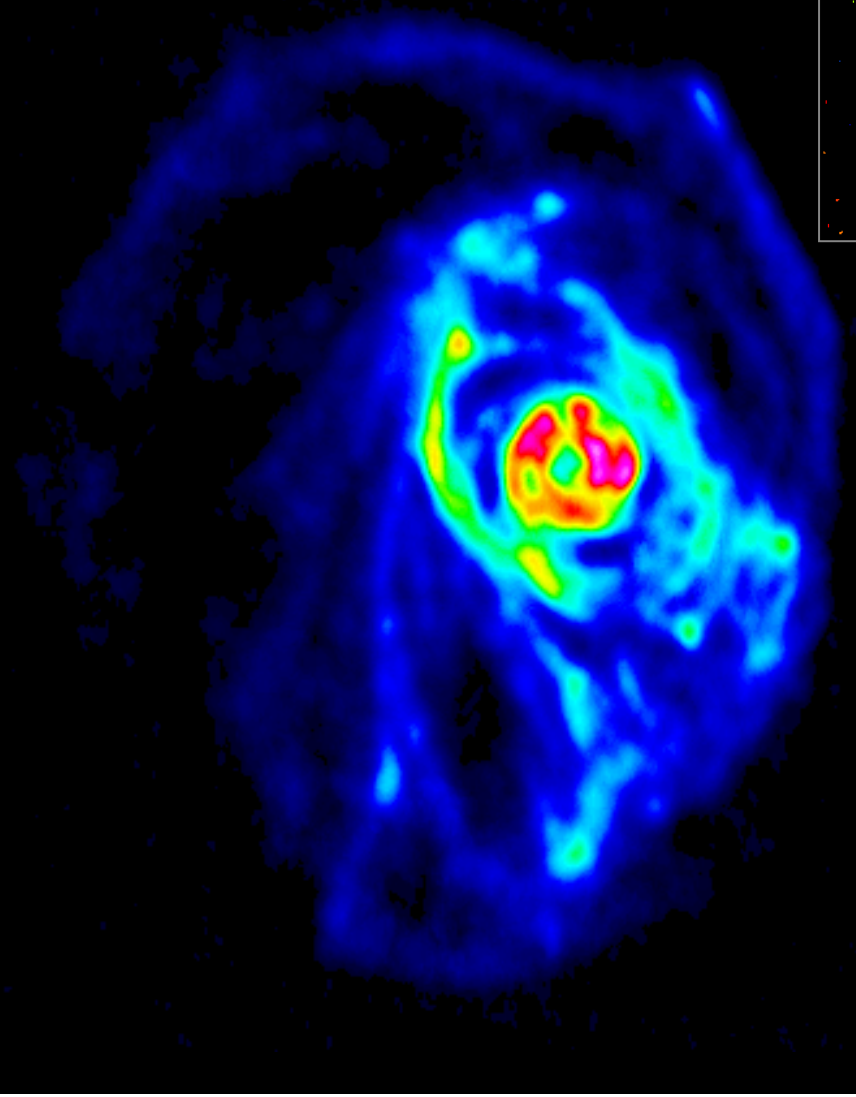
The Galaxy M83

(Koribalski et al. 2011, in prep.)

- HIPASS J1336−29
- D ≈ 4.5 Mpc
- HI extent > 80 kpc
- $M_{HI} = 8 \times 10^9 M_\odot$

GALEX NUV+FUV; Thilker et al.





ATCA + Parkes HI mosaic

The Galaxy M83: from XUV to 2X-HI

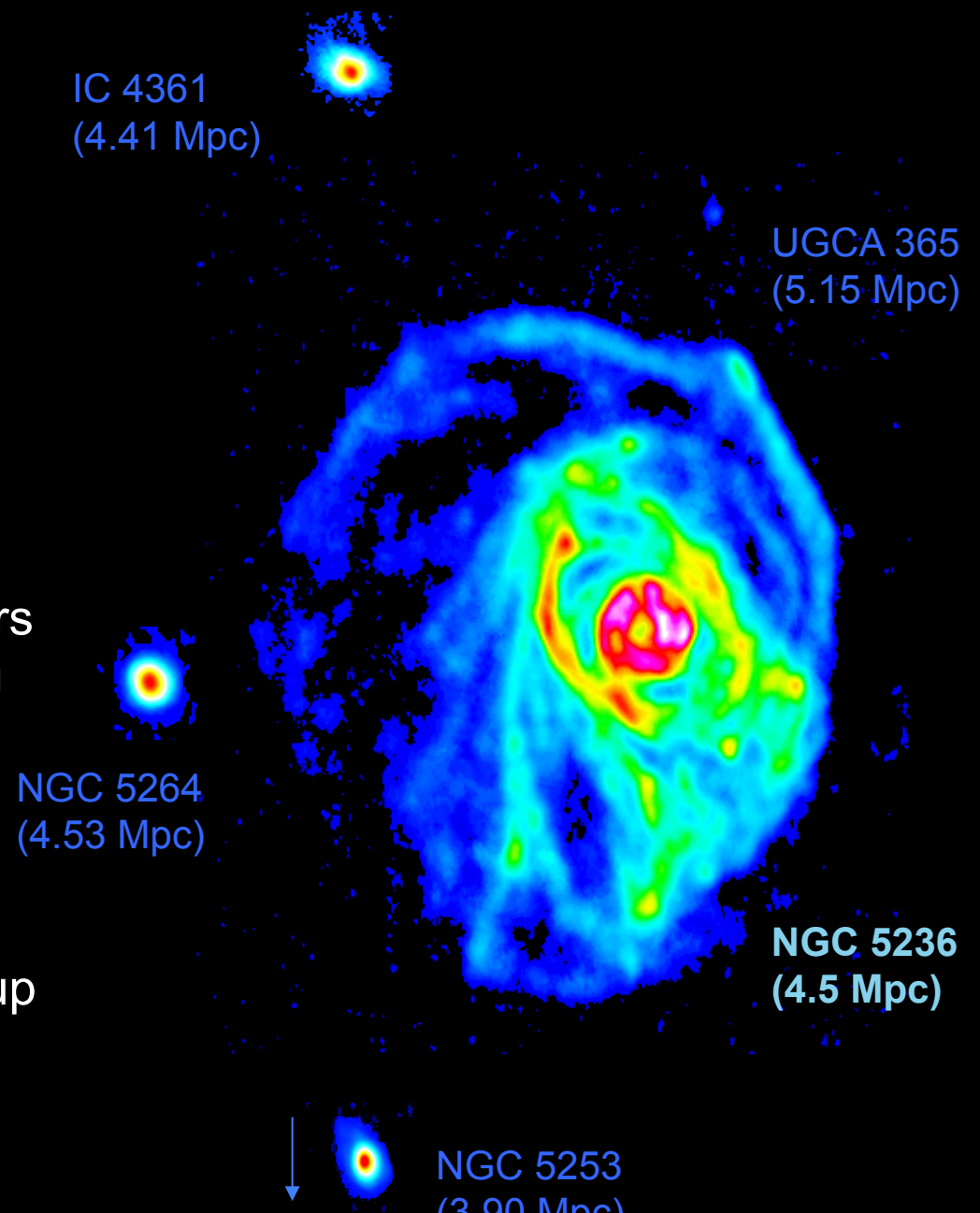
(Koribalski et al. 2011, in prep.)

- HIPASS J1336−29
- D ≈ 4.5 Mpc
- HI extent > 80 kpc
- $M_{HI} = 8 \times 10^9 M_\odot$

HI is an excellent tracer for SF in the outer disk

color-composite by Angel Lopez-Sanchez

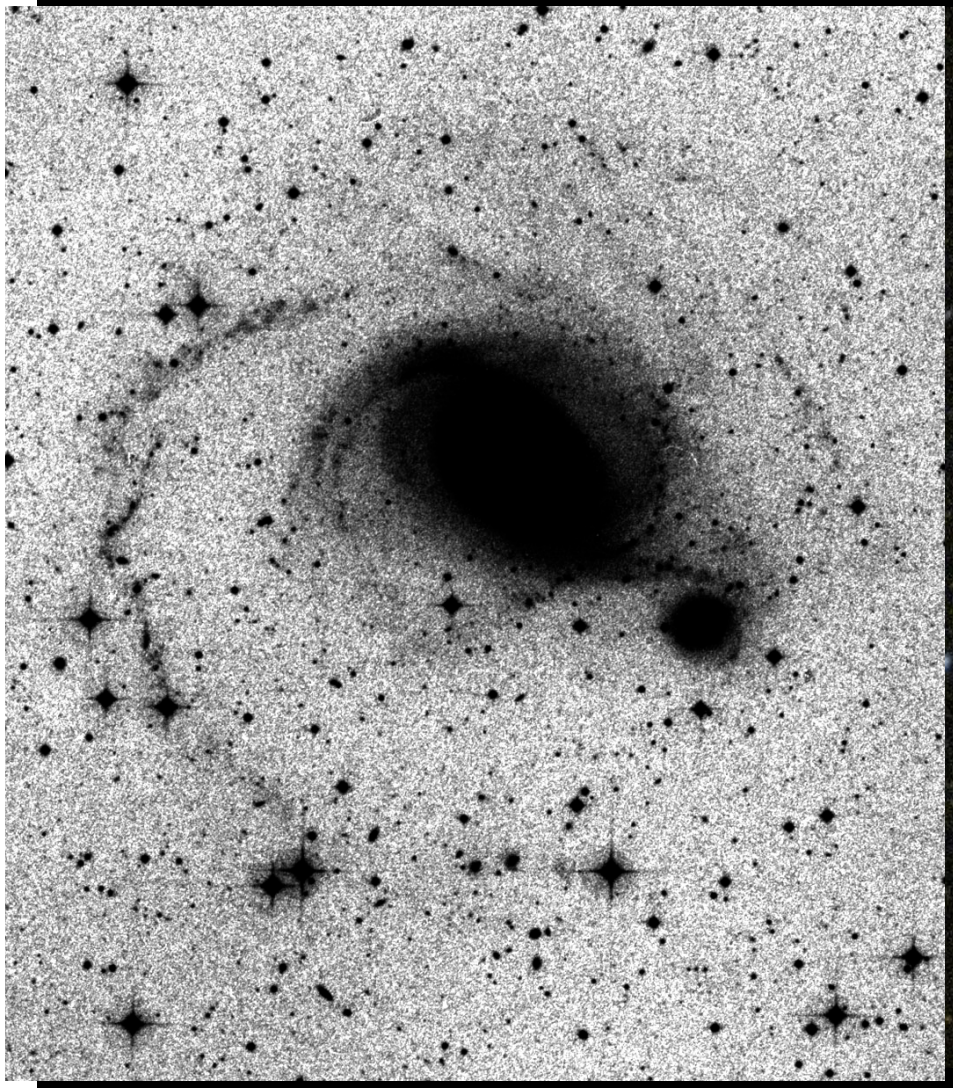
M83 and its closest neighbours



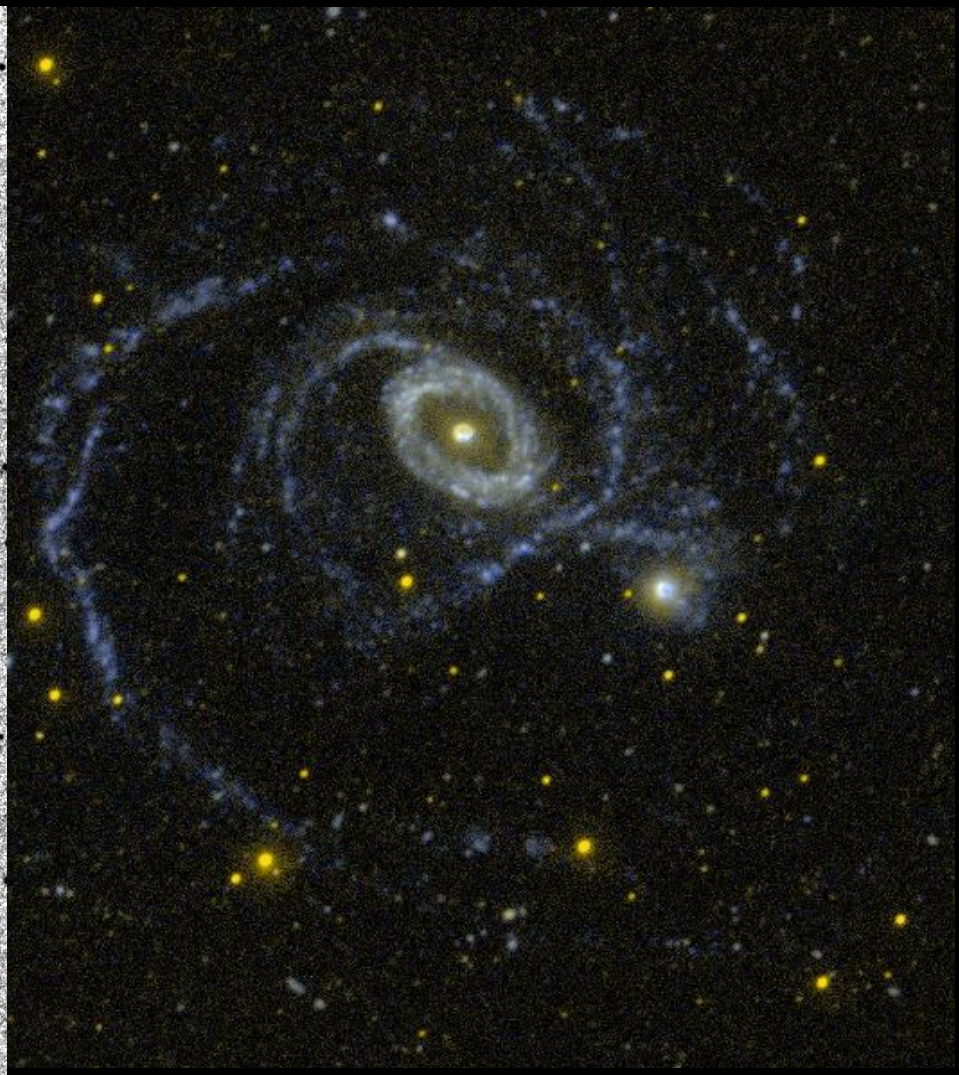
The spiral galaxy M83 appears to grow by regularly accreting neighboring dwarf galaxies.

Gaseous tails and stellar streams tell us about the group evolution.

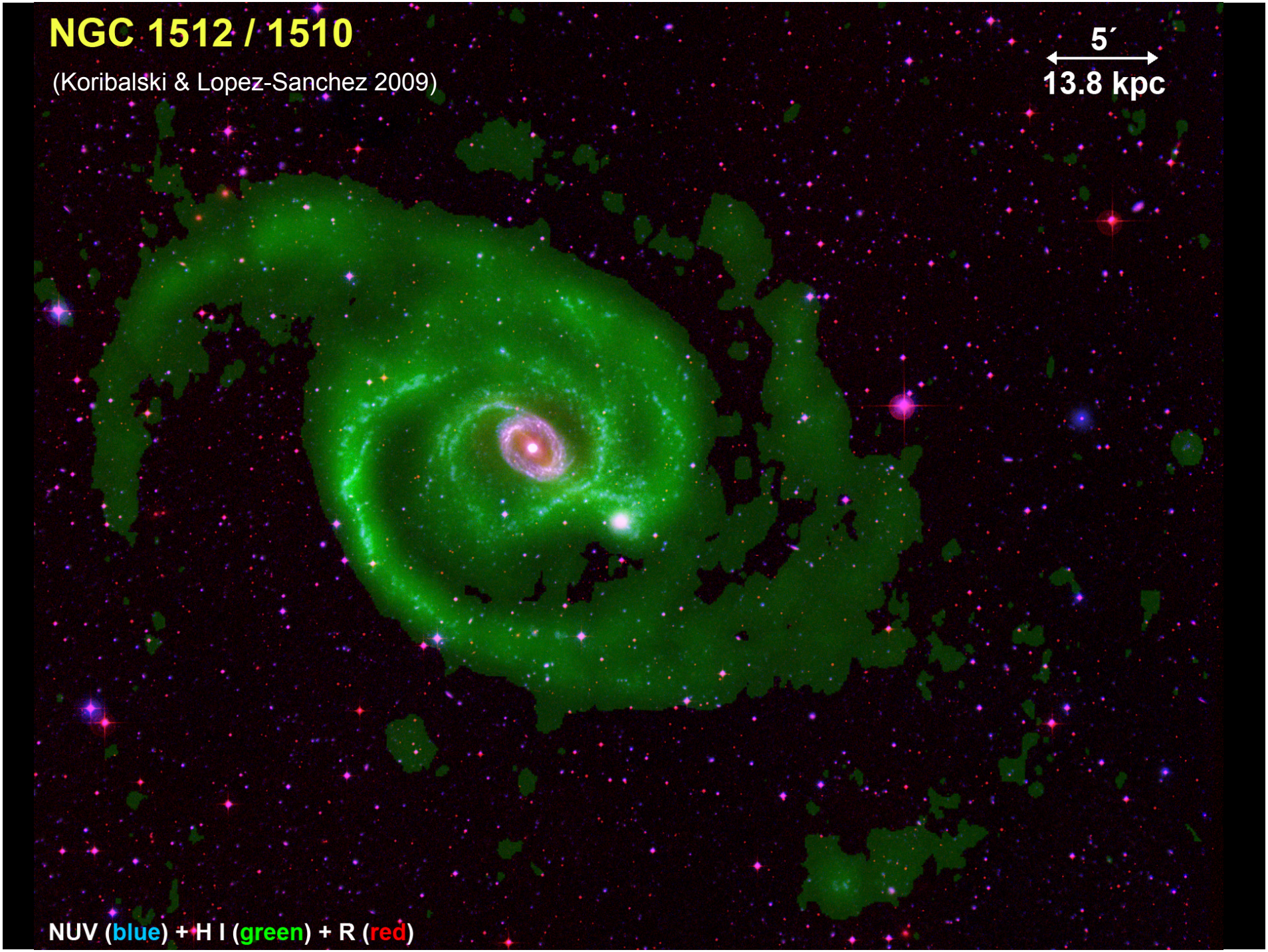
NGC 1512/10



deep optical image by Dave Malin

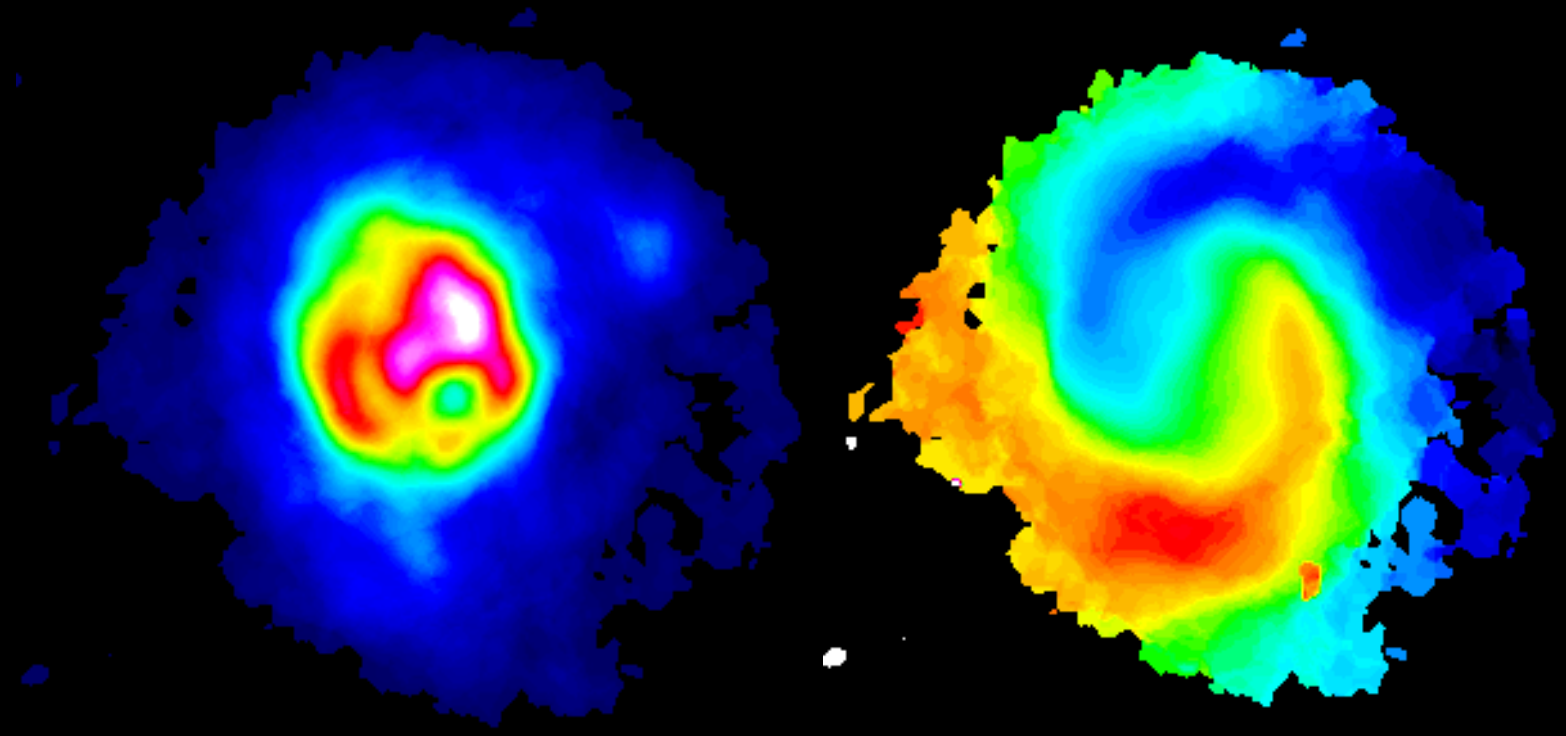


GALEX NUV+FUV two-color image


NGC 1512 / 1510
(Koribalski & Lopez-Sanchez 2009)
5′
13.8 kpc
NUV (blue) + H I (green) + R (red)

ESO 223-G009

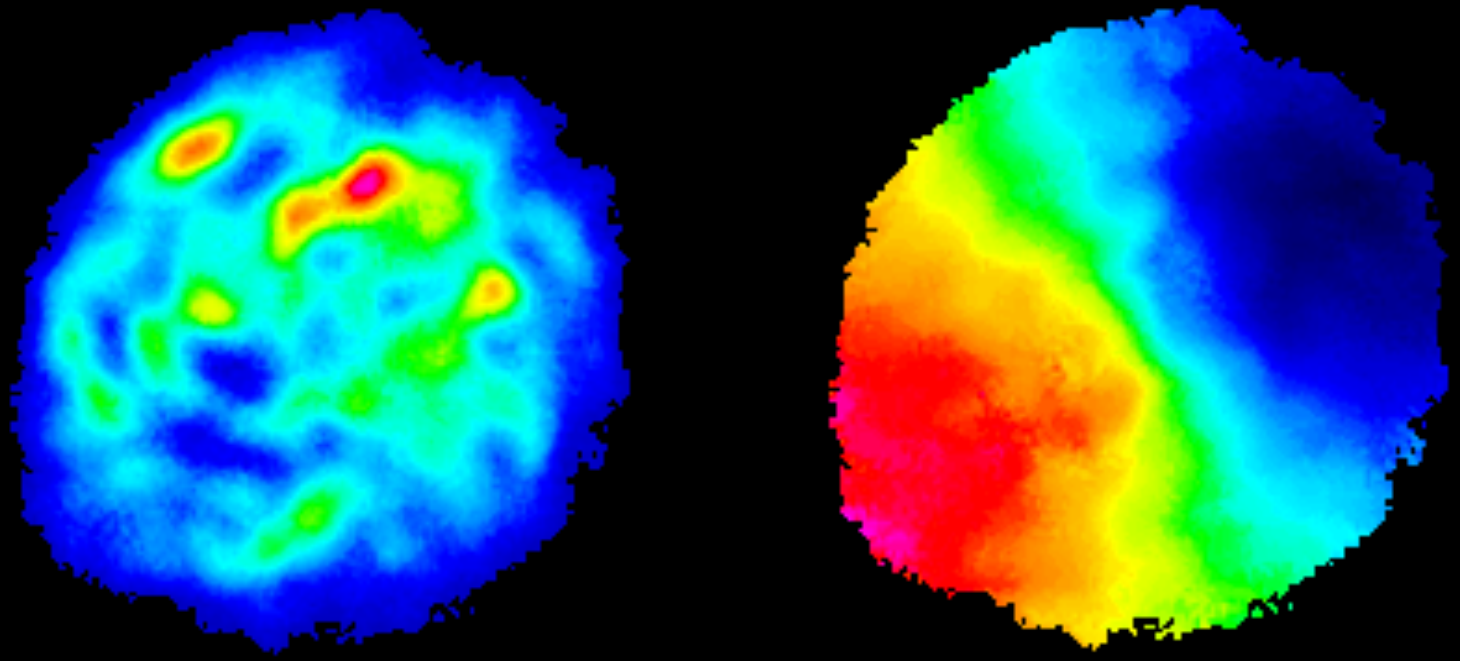
(Koribalski et al. 2011, in prep.)



HIPASS J1501-48 D_{TRGB} = 6.17 Mpc

ESO 215-G?009

(Warren, Jerjen & Koribalski 2004)



HIPASS J1057-48 D_{TRGB} = 5.25 Mpc

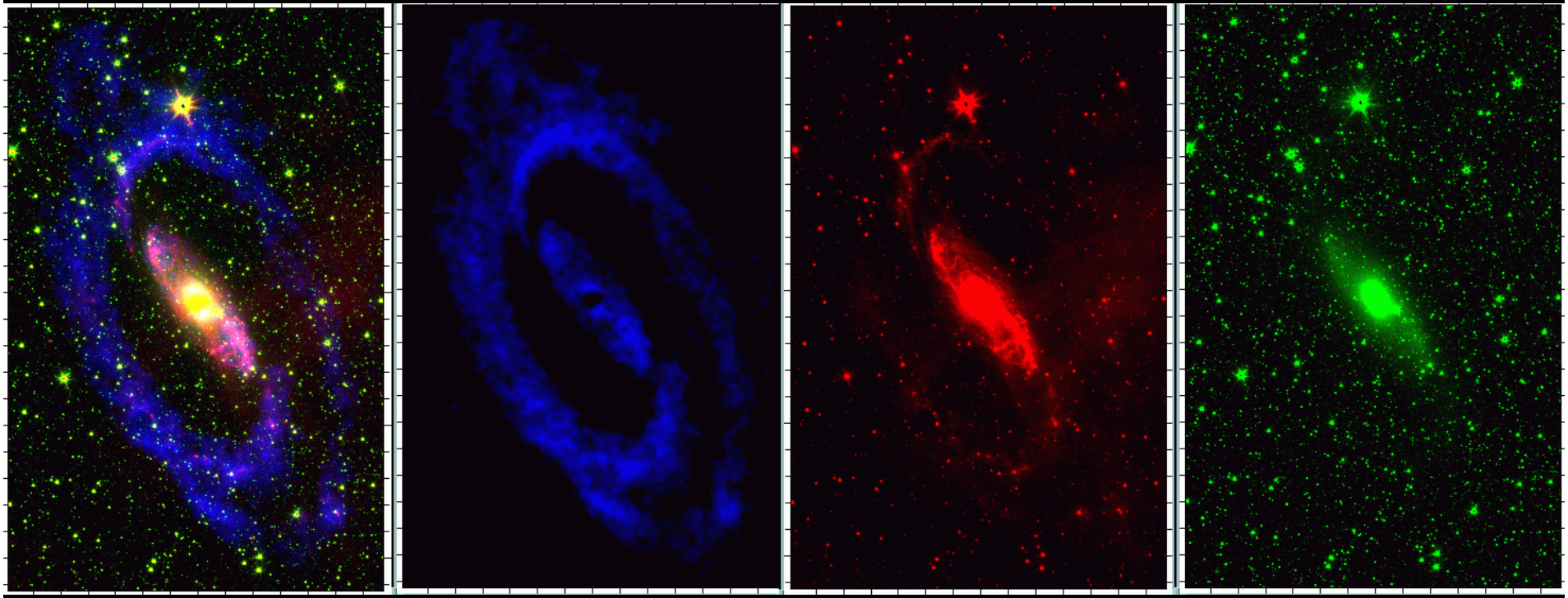
Spitzer IRAC obs.

composite

Neutral atomic hydrogen gas (HI 21-cm line)

Polycyclic **A**romatic **H**ydrocarbons = SF tracer

old stellar population



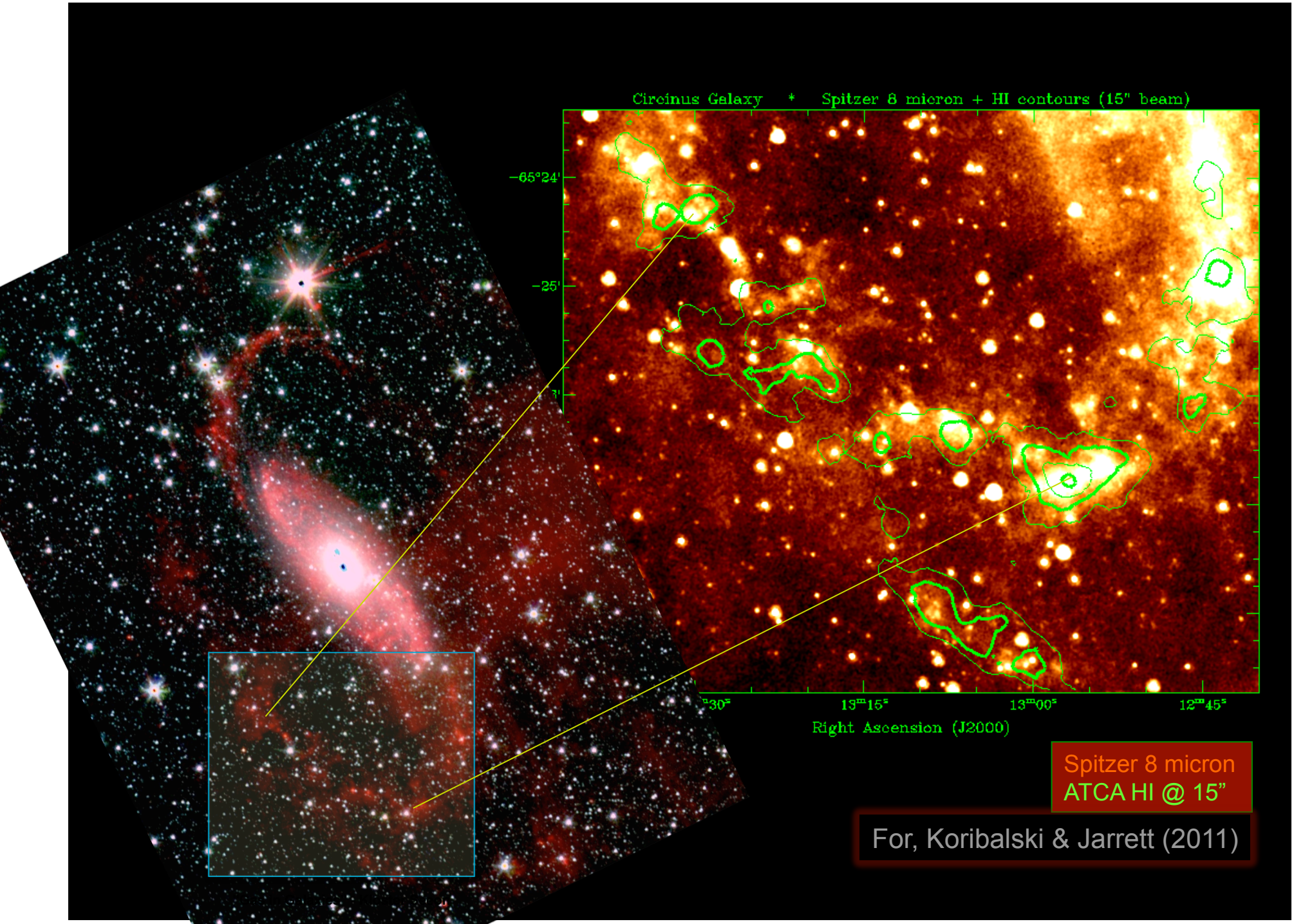
ATCA HI (high-res)

Spitzer 8 micron

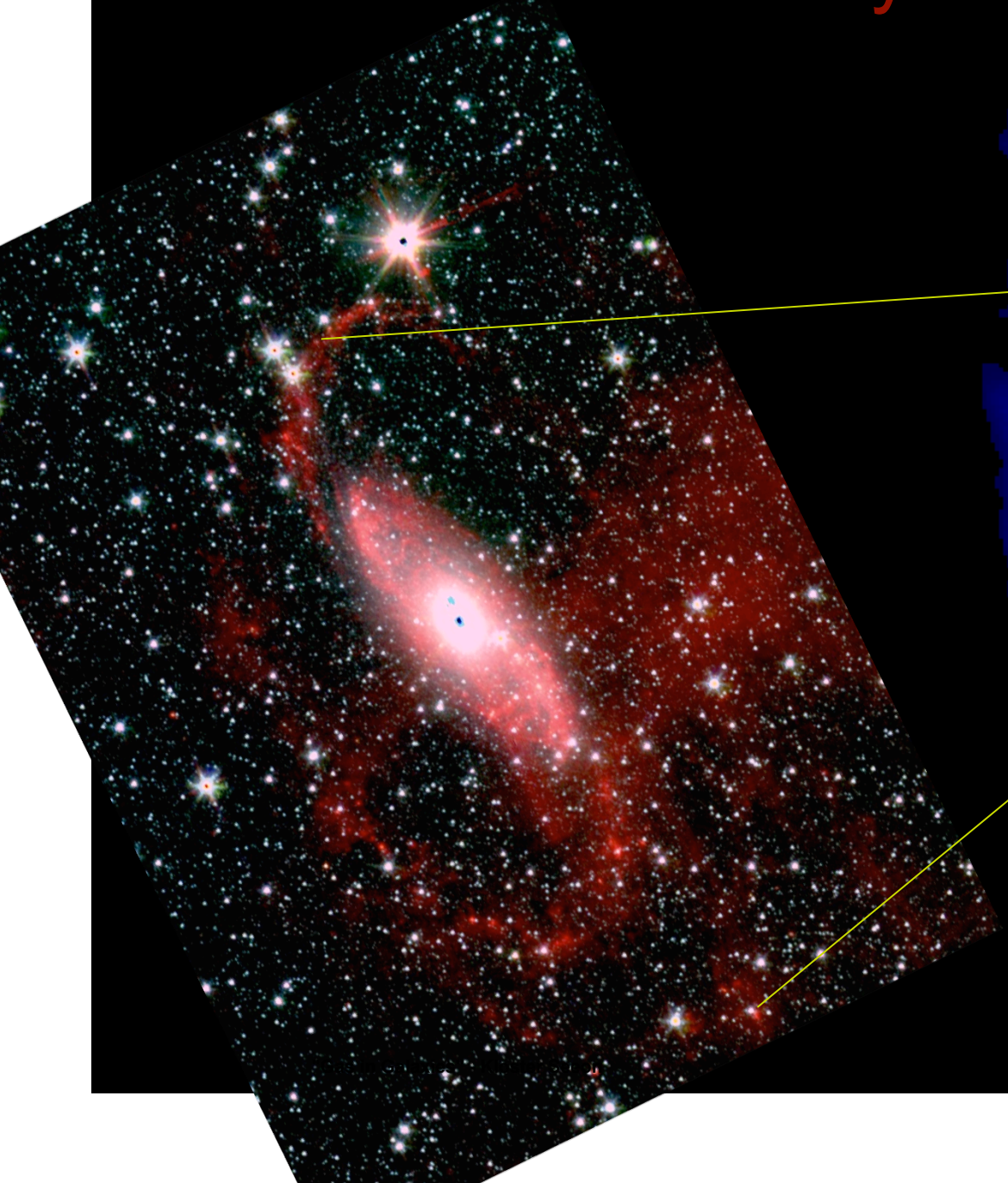
Spitzer 3.6 micron

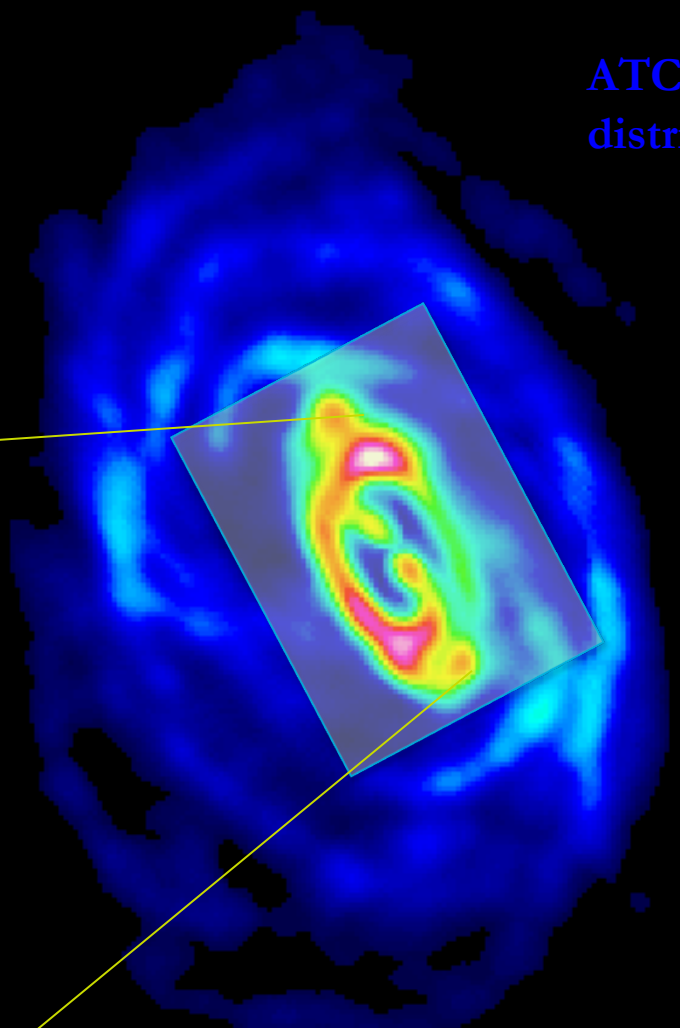
The Circinus Galaxy

For, Koribalski & Jarrett (2011)


Circinus Galaxy * Spitzer 8 micron + HI contours (15" beam)
−65°24'
−25'
13ʰ15ˢ
13ʰ00ˢ
12ʰ45ˢ
Right Ascension (J2000)
Spitzer 8 micron
ATCA HI @ 15”
For, Koribalski & Jarrett (2011)

The Circinus Galaxy

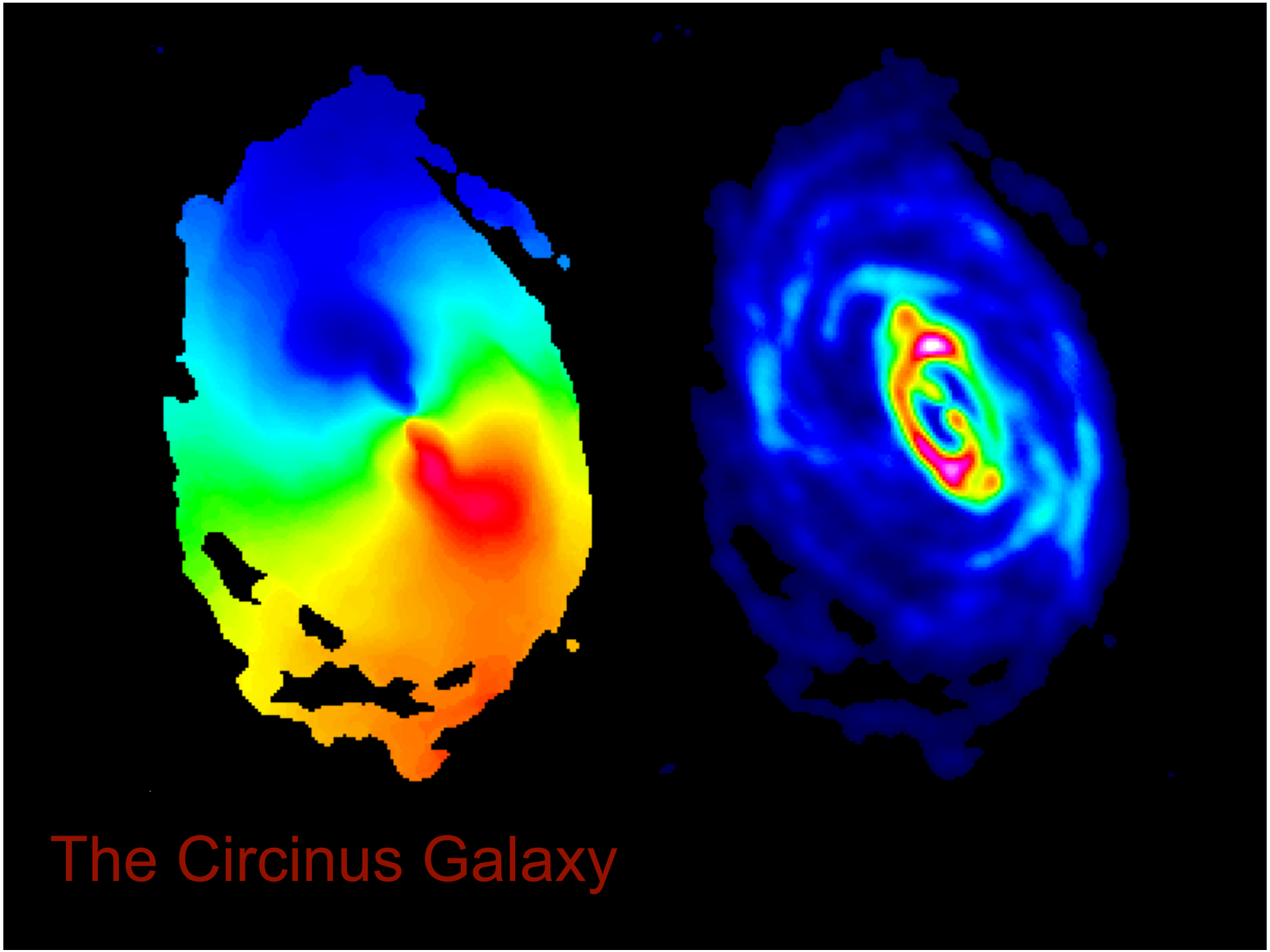




ATCA HI distribution

Neutral atomic hydrogen gas (HI) observed at 21-cm

➔ inner & outer disk (tracing DM), filaments, tidal streams, neighbours, …


The Circinus Galaxy

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