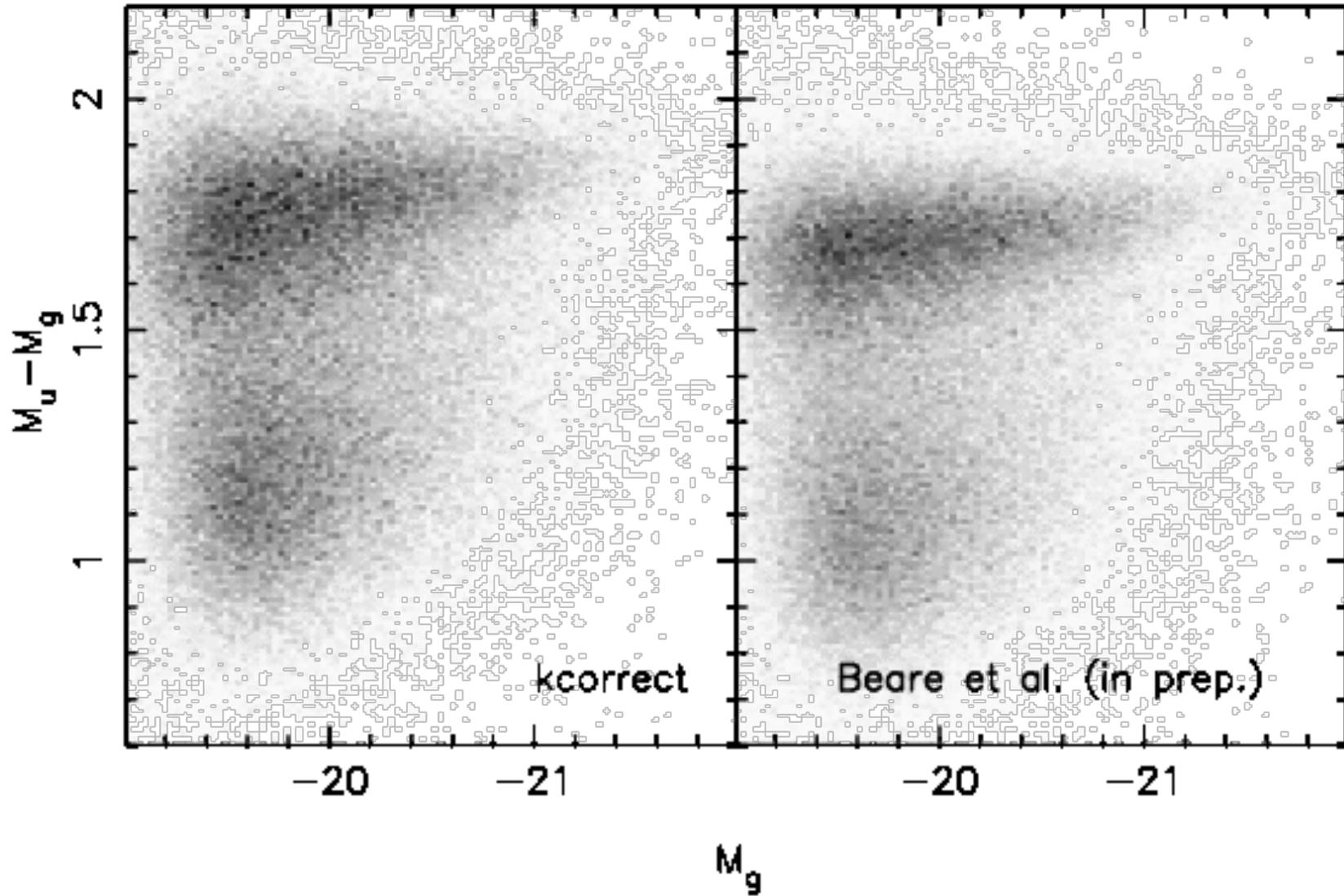


Star Formation in Red Spiral Galaxies

Michael Brown
ARC Future Fellow
Monash University

David Floyd, Tim Dolley, Nic Bonne, Richard Beare, Sam Penny

Red Herring Diagram

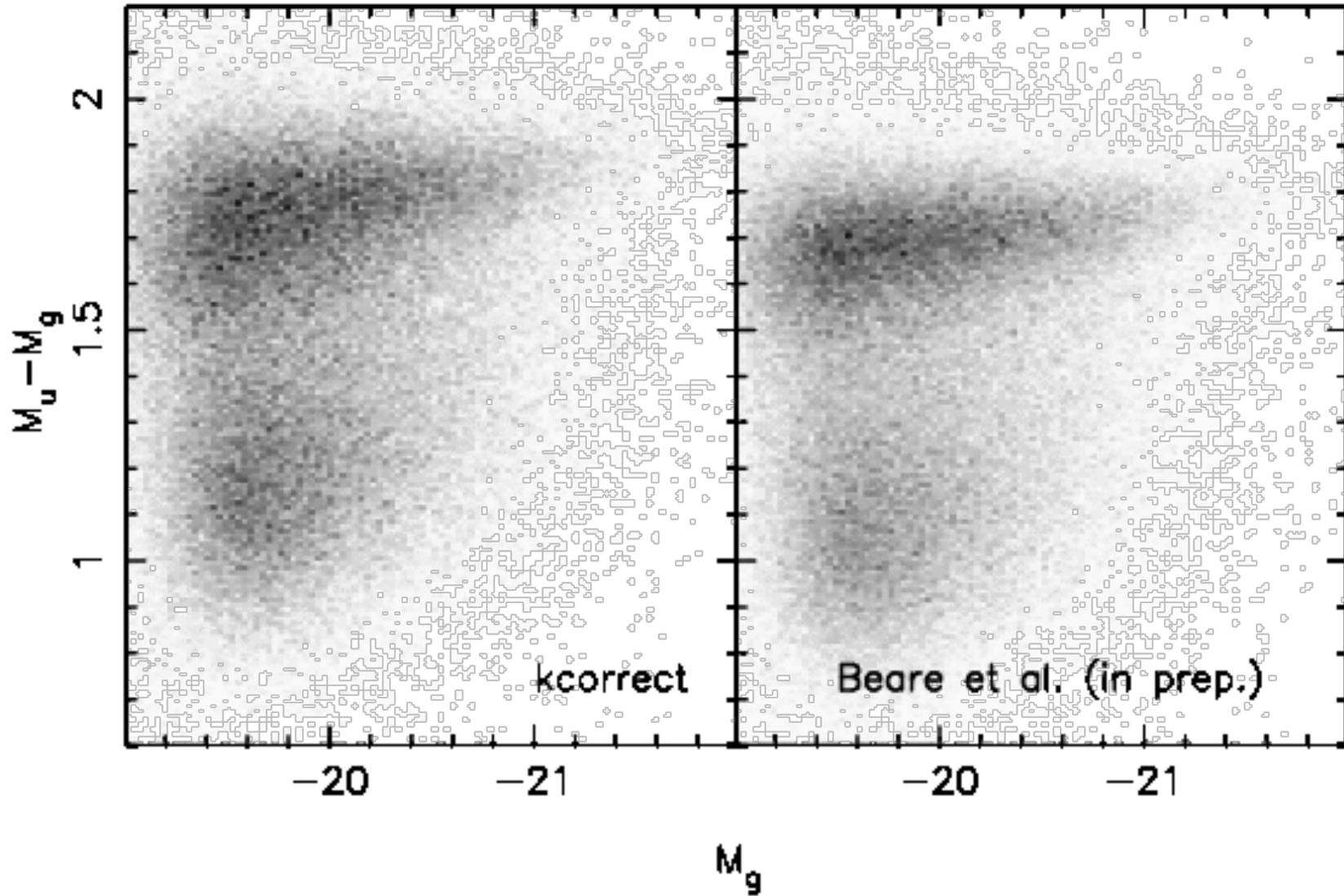


Brown et al. (SED Library)

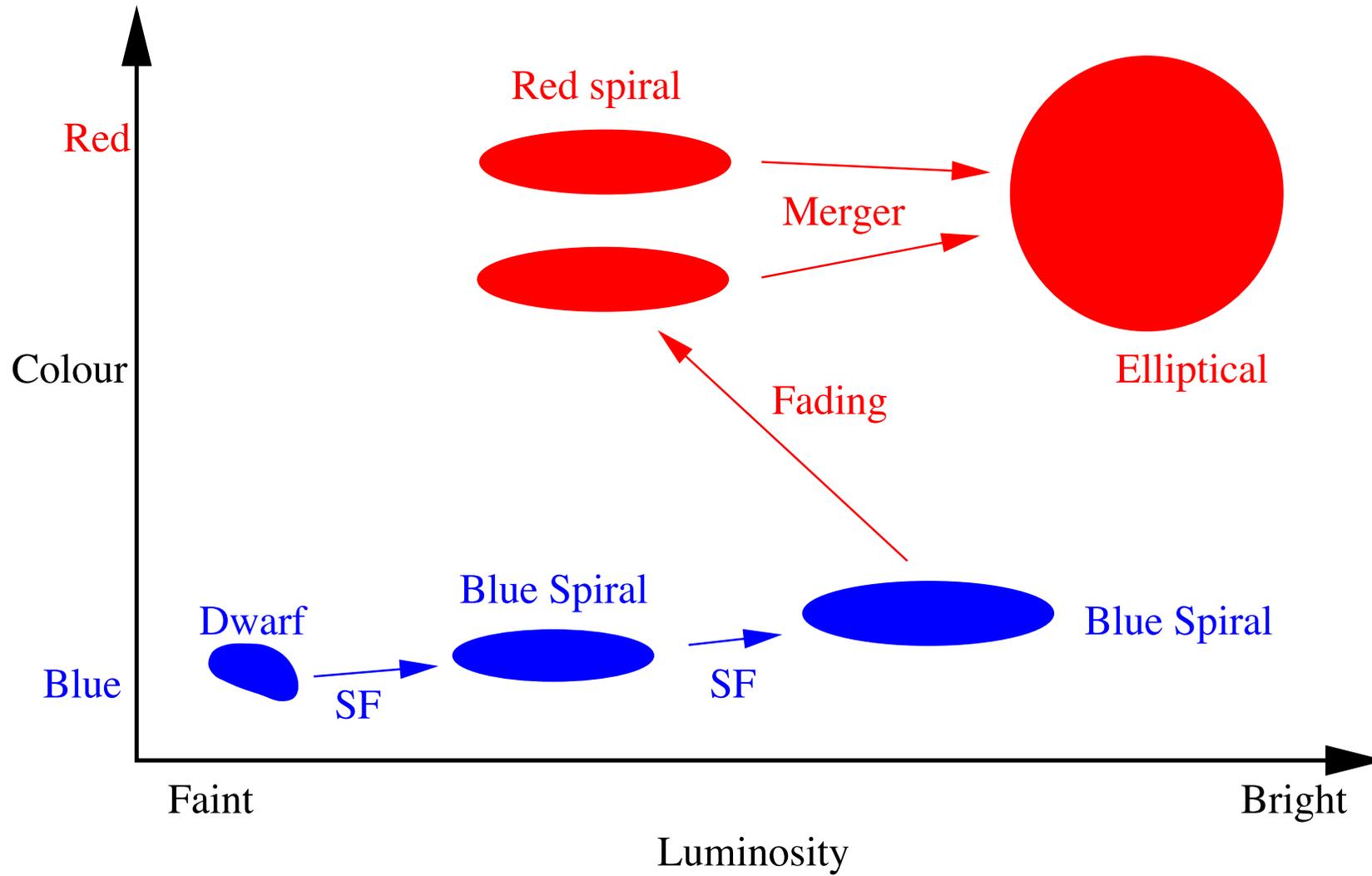
- 120 SEDs of local galaxies
- 0.1 to 35 micron wavelength coverage
- Smaller uncertainties than prior literature

- <http://www.aao.gov.au/conferences/fireworks/Talks/Brown.pdf>

Red Herring Diagram

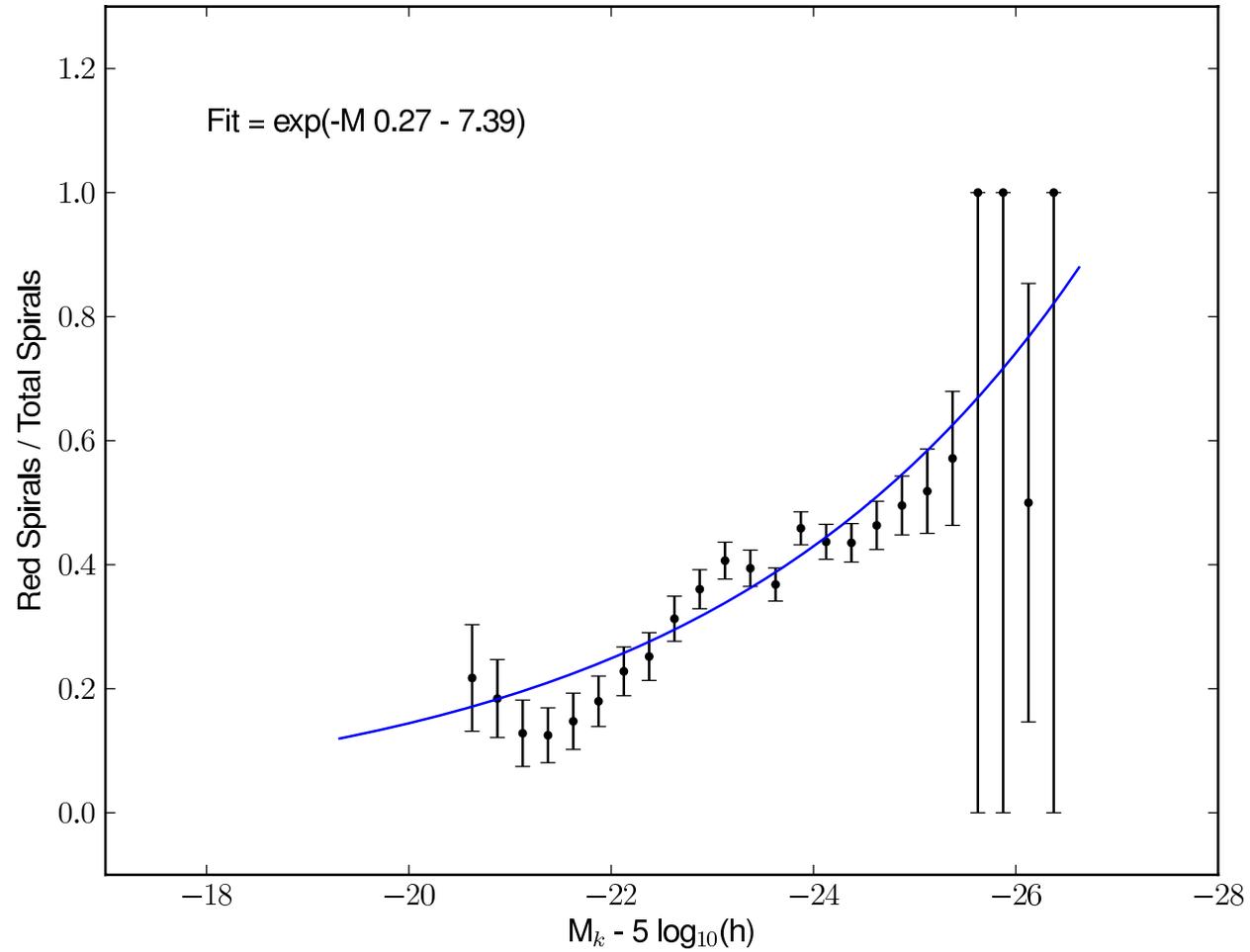


Galaxy Evolution



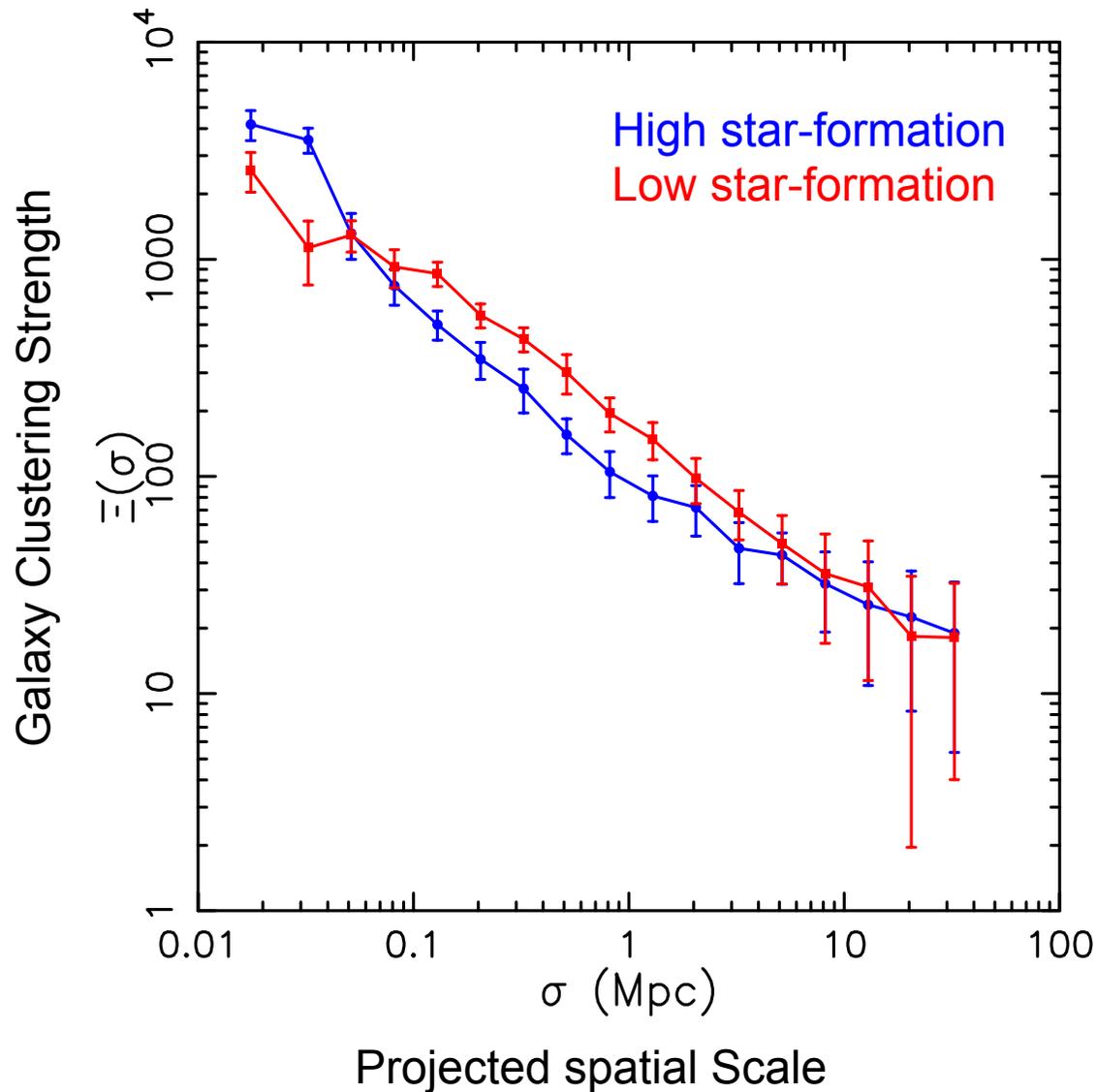
Bonne et al. (in prep.)

Red Spiral / Total Spiral



K-band Absolute Magnitude

Dolley et al. (in prep.)



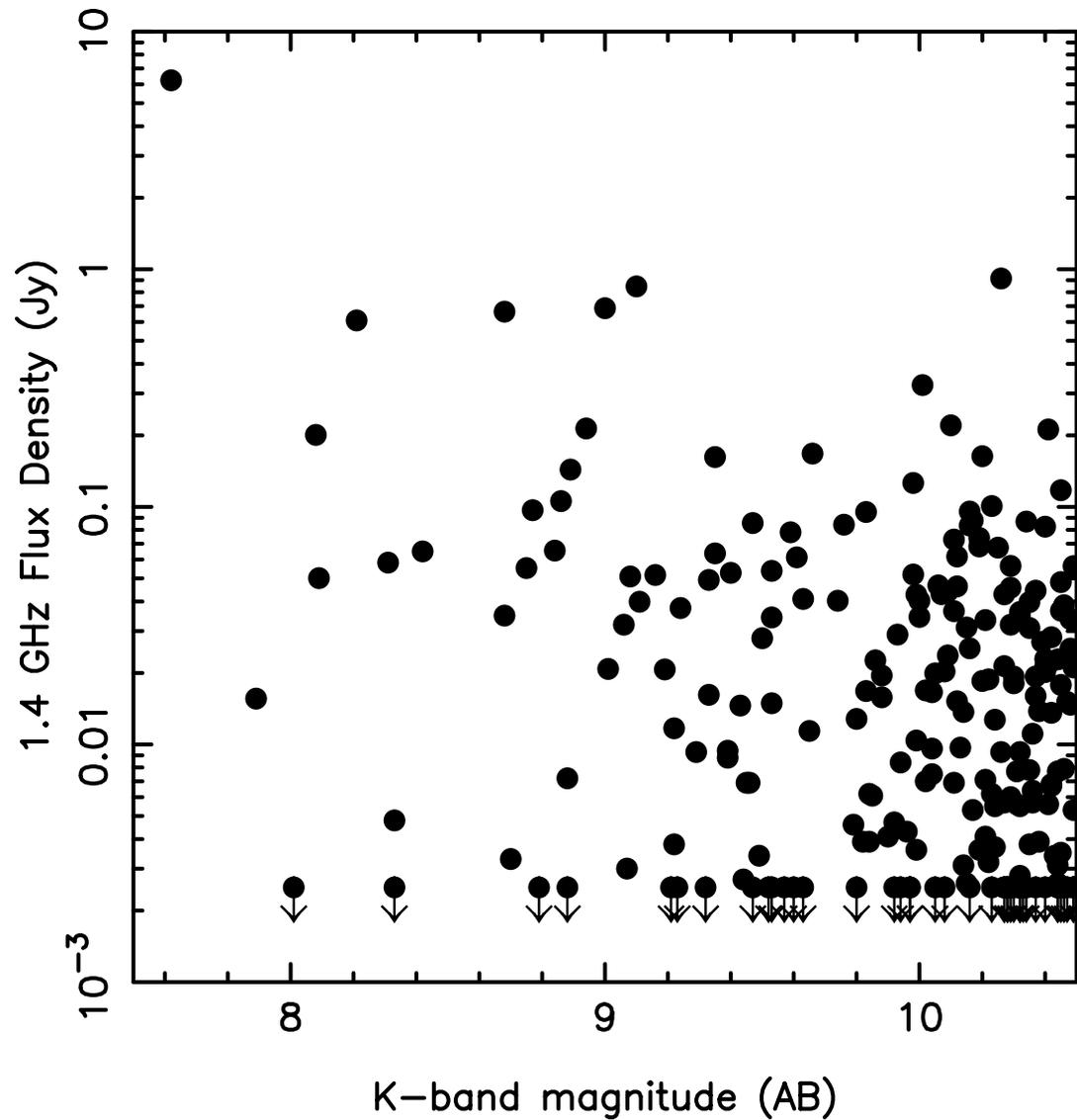
Similar large-scale clustering for high and low SFR spirals.

High and low SFR spirals with similar stellar masses have similar halo masses

Are Red Spirals Forming Stars?

- $K_{AB} < 10.5$ spiral galaxies
 - Bonne et al. (in prep) and Floyd et al. (sub.)
- NVSS 1.4 GHz as a star formation proxy
 - 1.4 GHz is not impacted by dust obscuration
- WISE mid-IR to search for warm dust
 - Dust is heated by star formation
- 21-cm to search for neutral hydrogen
 - Could star formation resume?

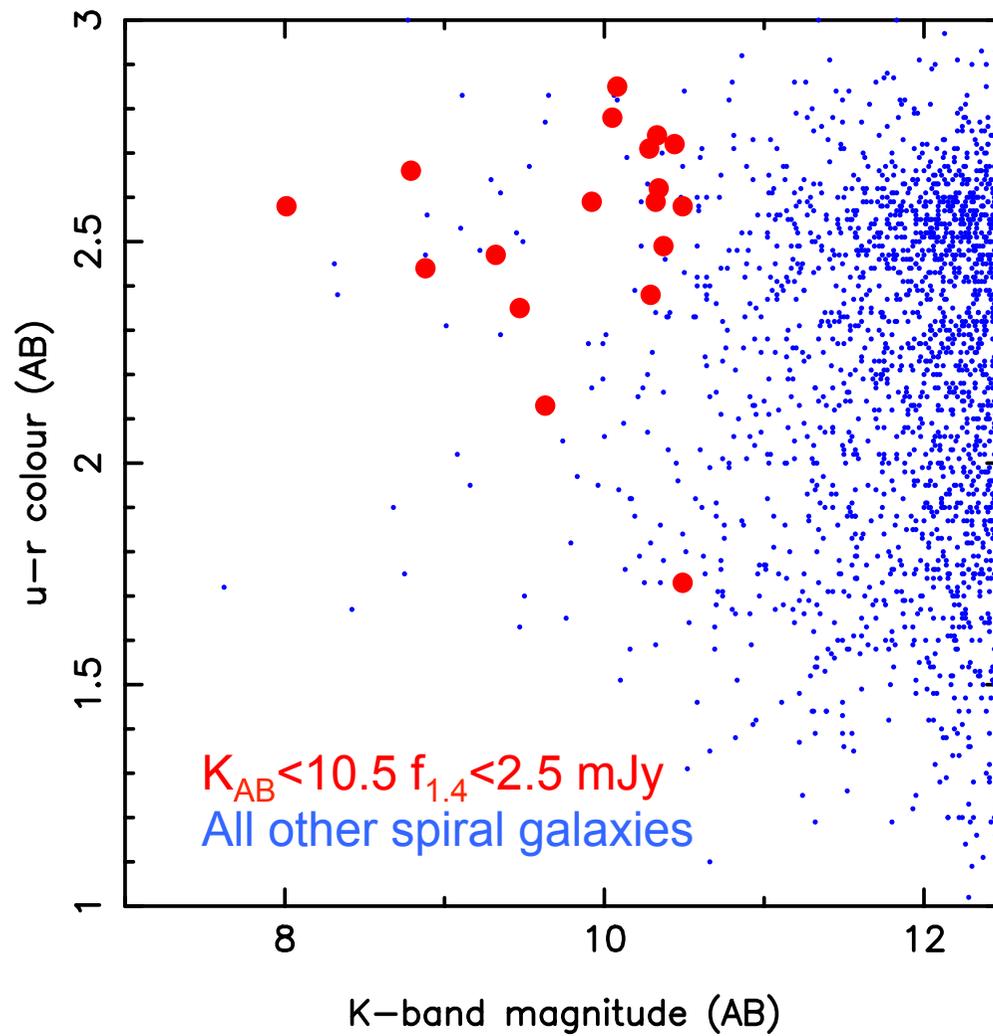
Sample Selection

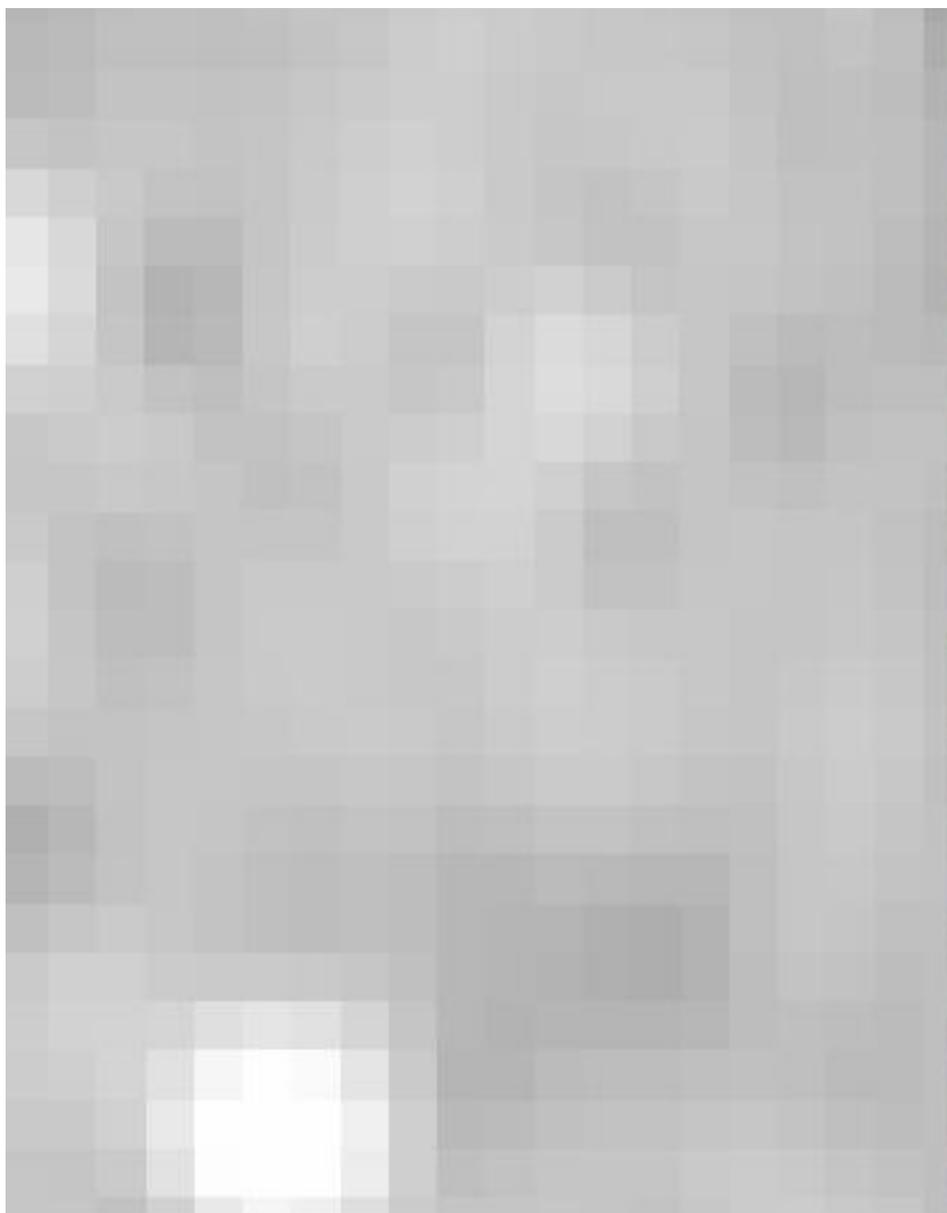


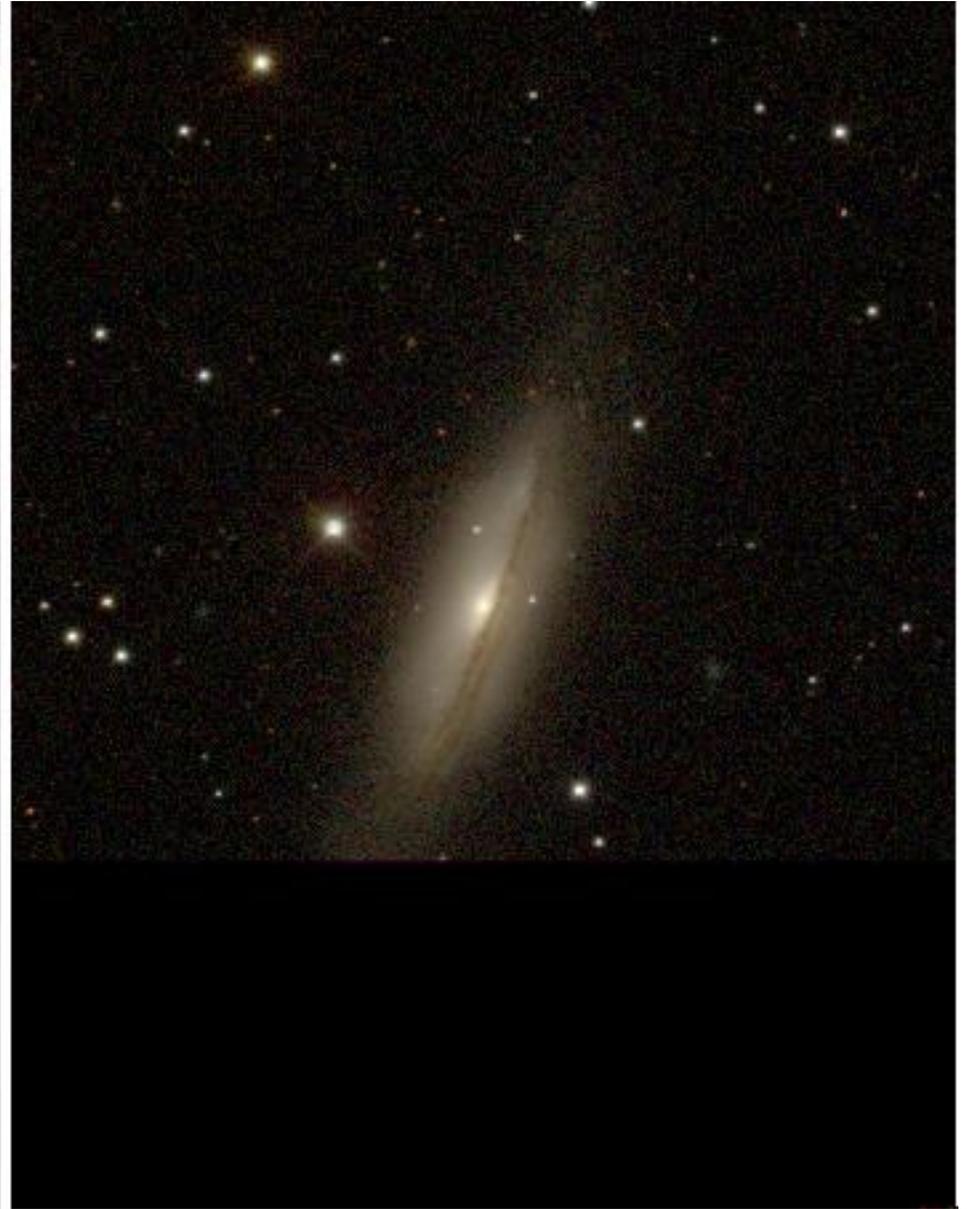
$K_{AB} < 10.5$
T-type > -1
NVSS 1.4 GHz coverage
228 galaxies

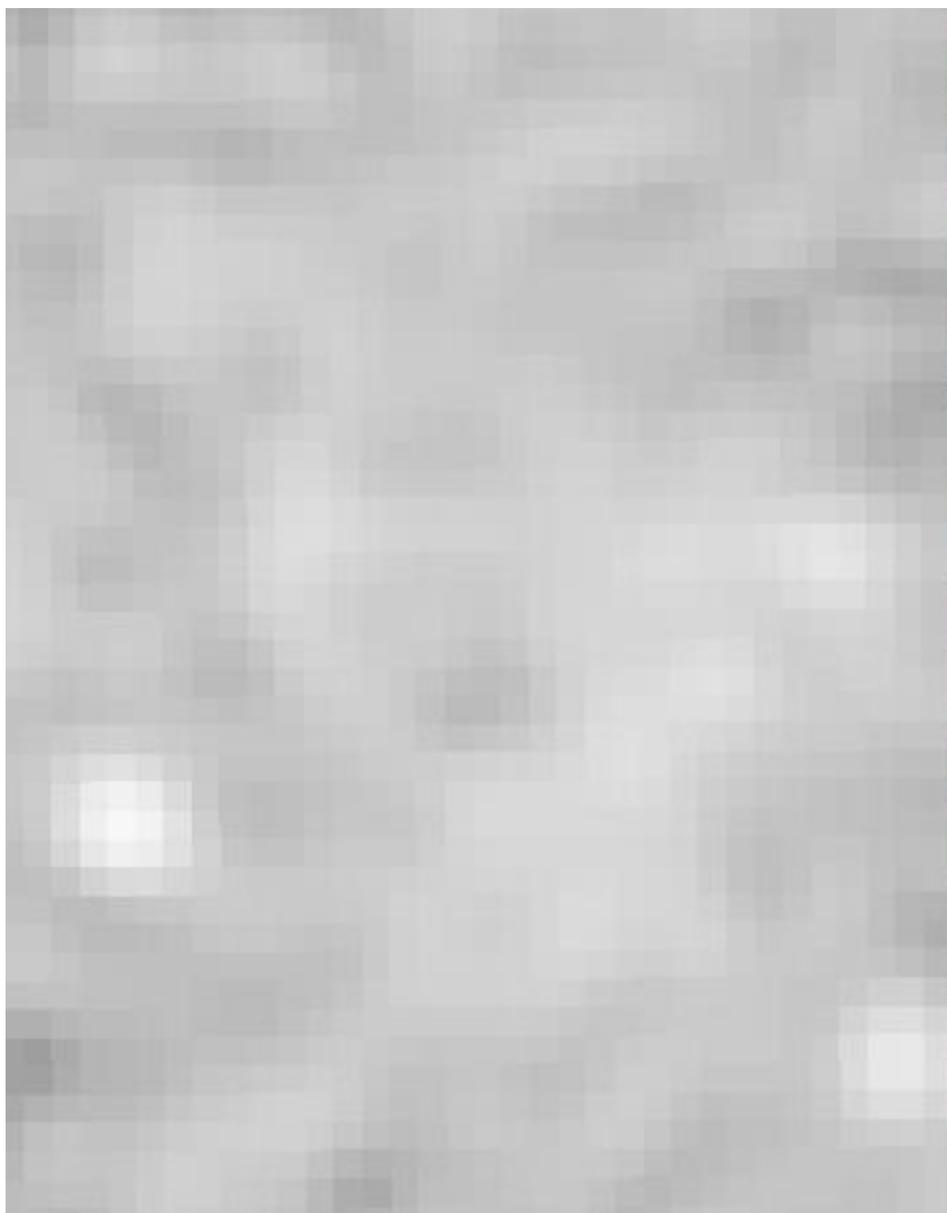
Select galaxies with
 $f_{1.4} < 2.5$ mJy
42 galaxies

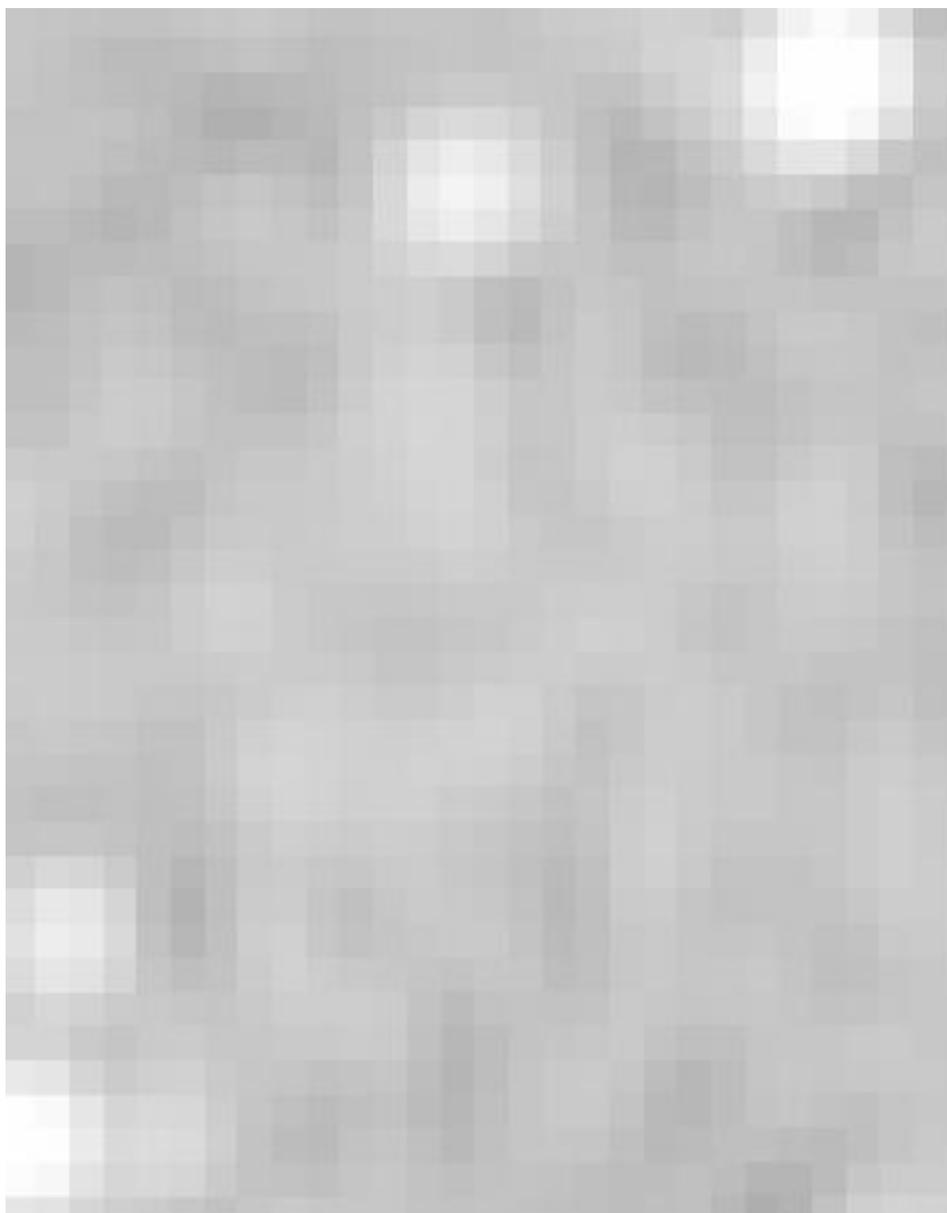
SDSS Optical Colours



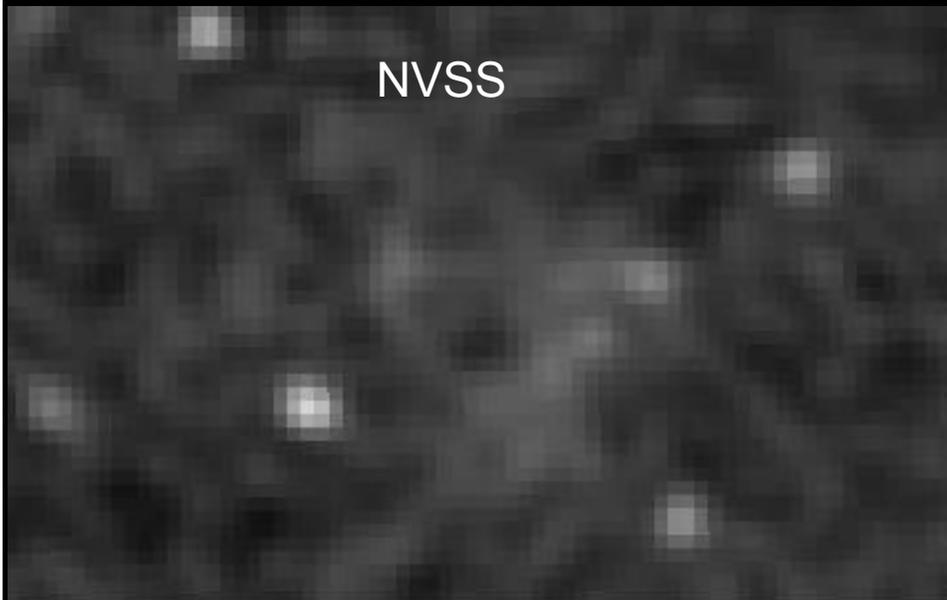








NVSS



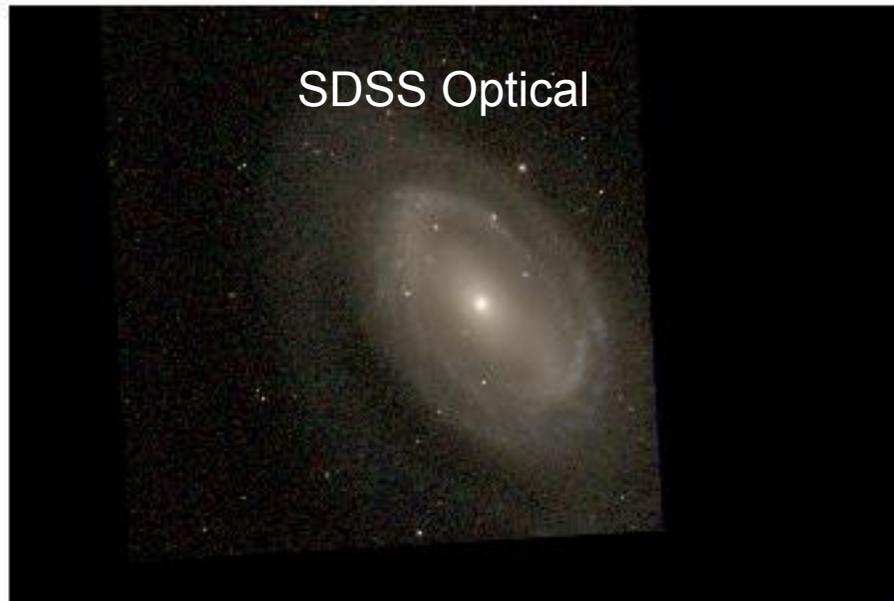
WISE 11 microns



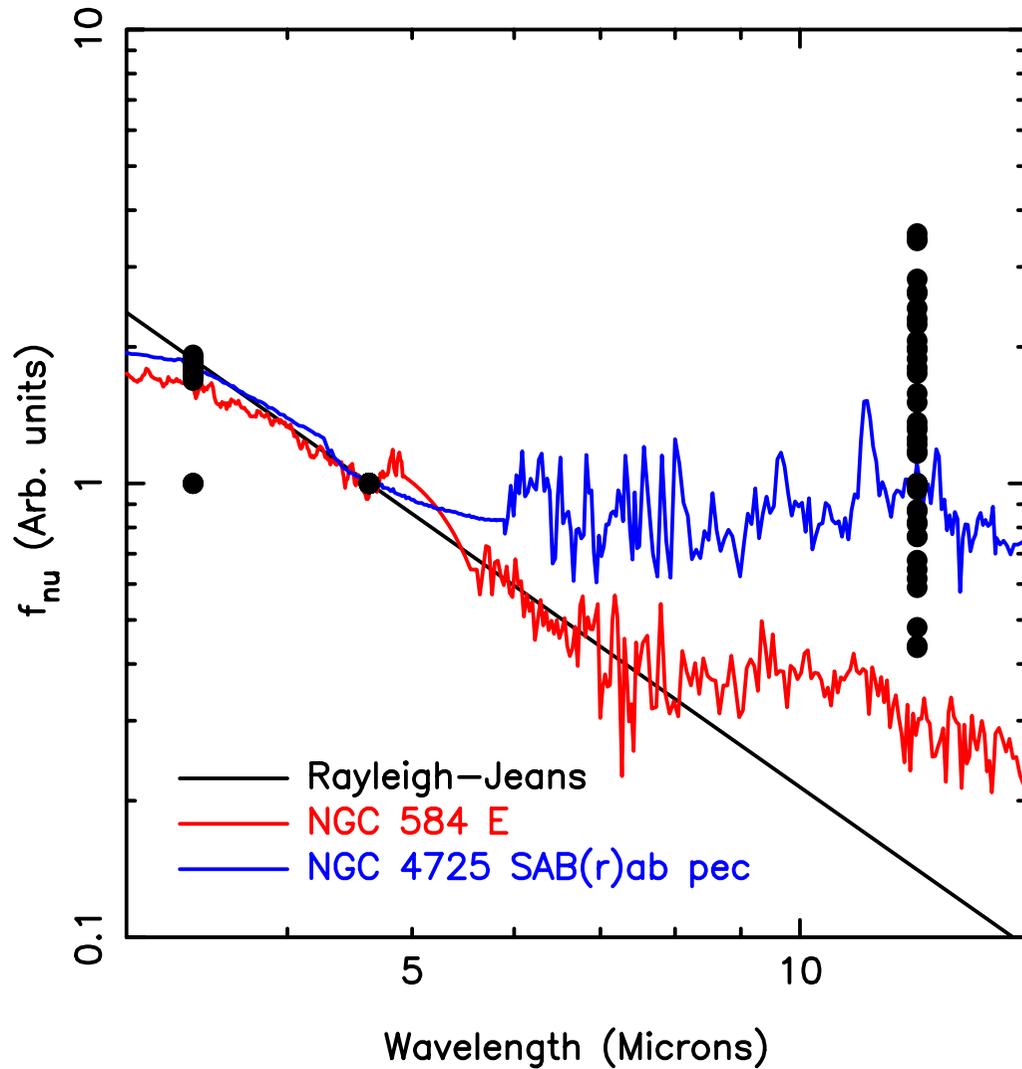
Spitzer 24 microns



SDSS Optical



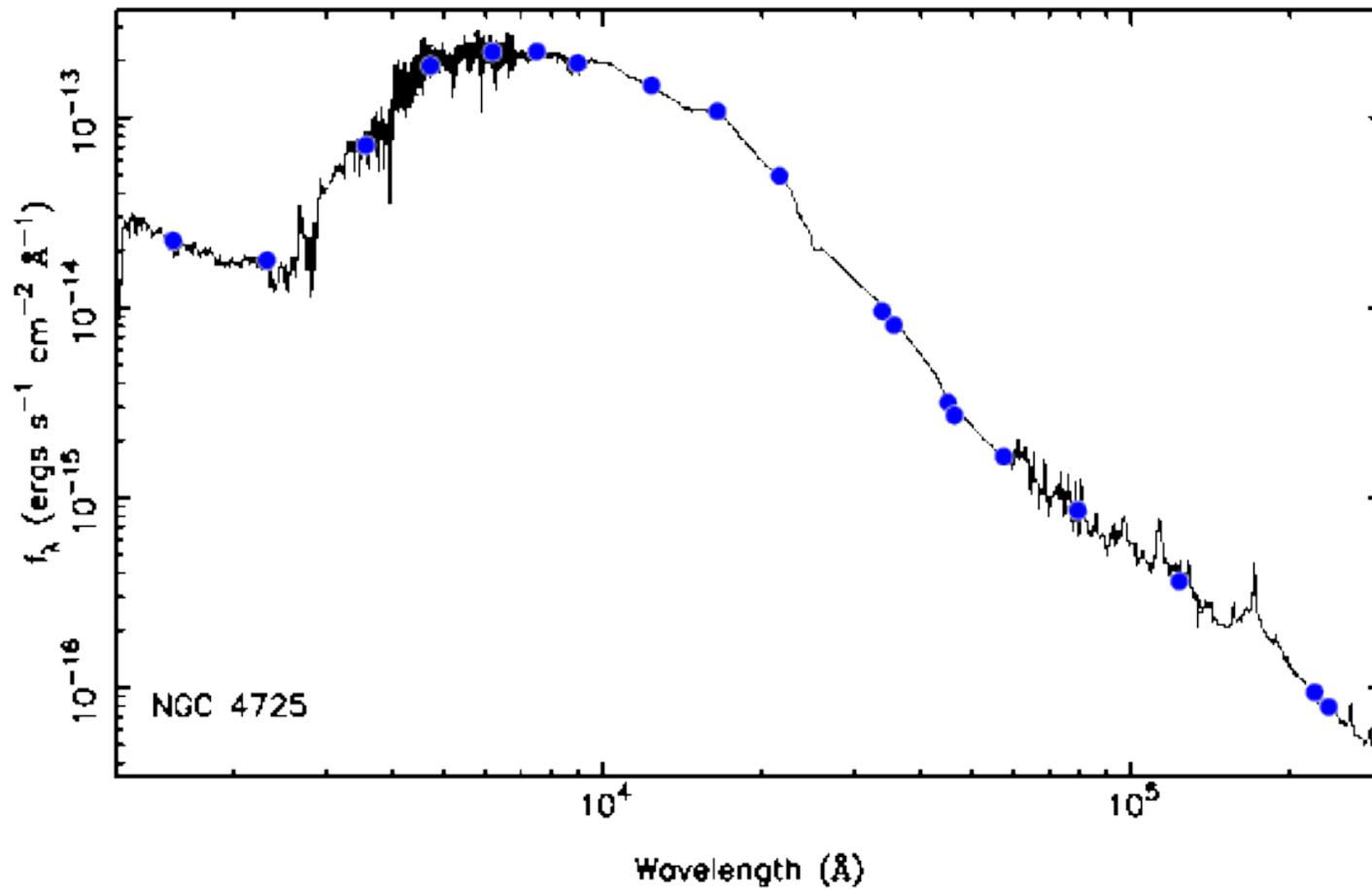
WISE Infrared SEDs



Wise Photometry (Dots)

IR excess relative to
passive elliptical galaxies

NGC 4725 spectrum
shows PAH and dust
emission



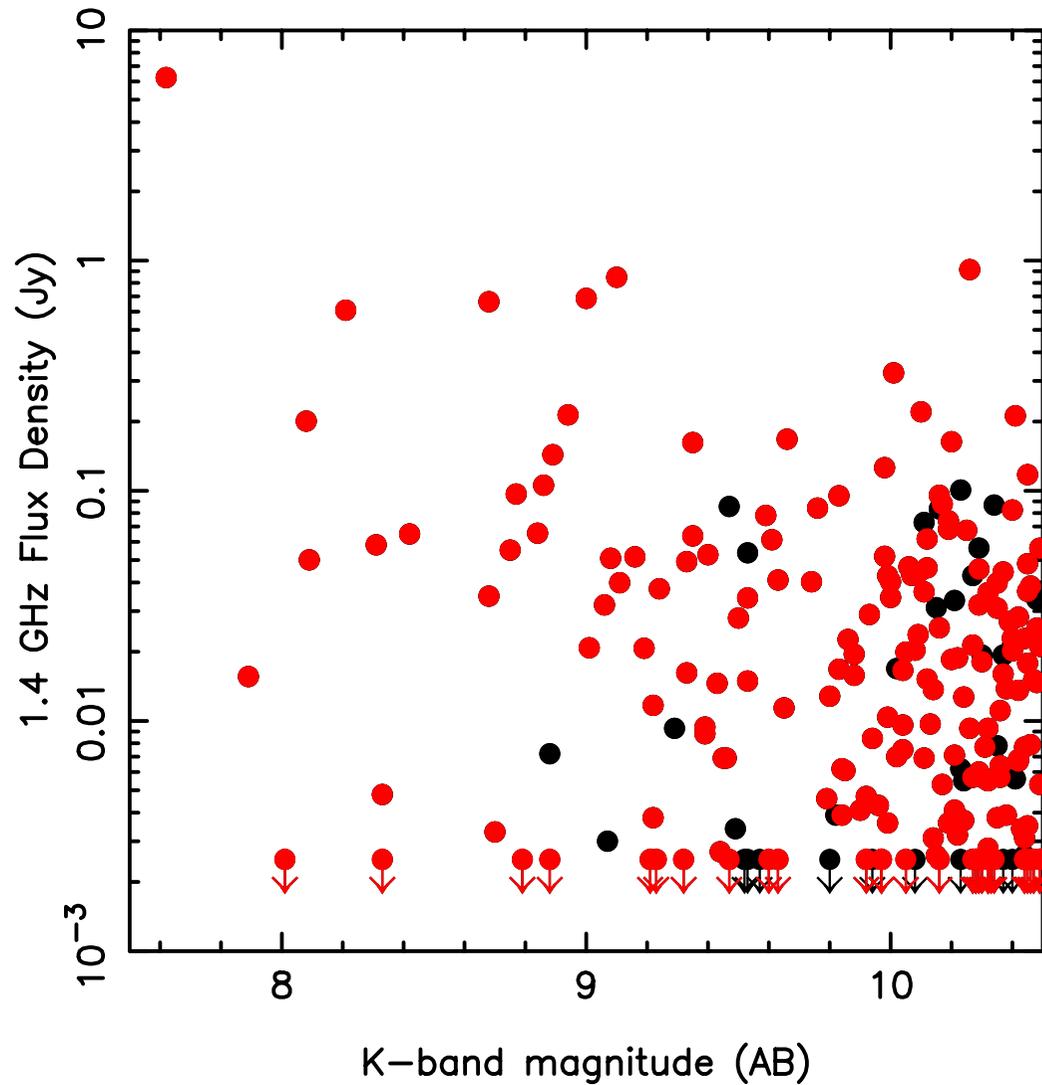
UV-optical
similar to
passive E

H-alpha lost
in the noise

Spiral arms
are blue in
UV-optical

IR excess

21-cm



Catalogued HI in red
Uncatalogued HI in black

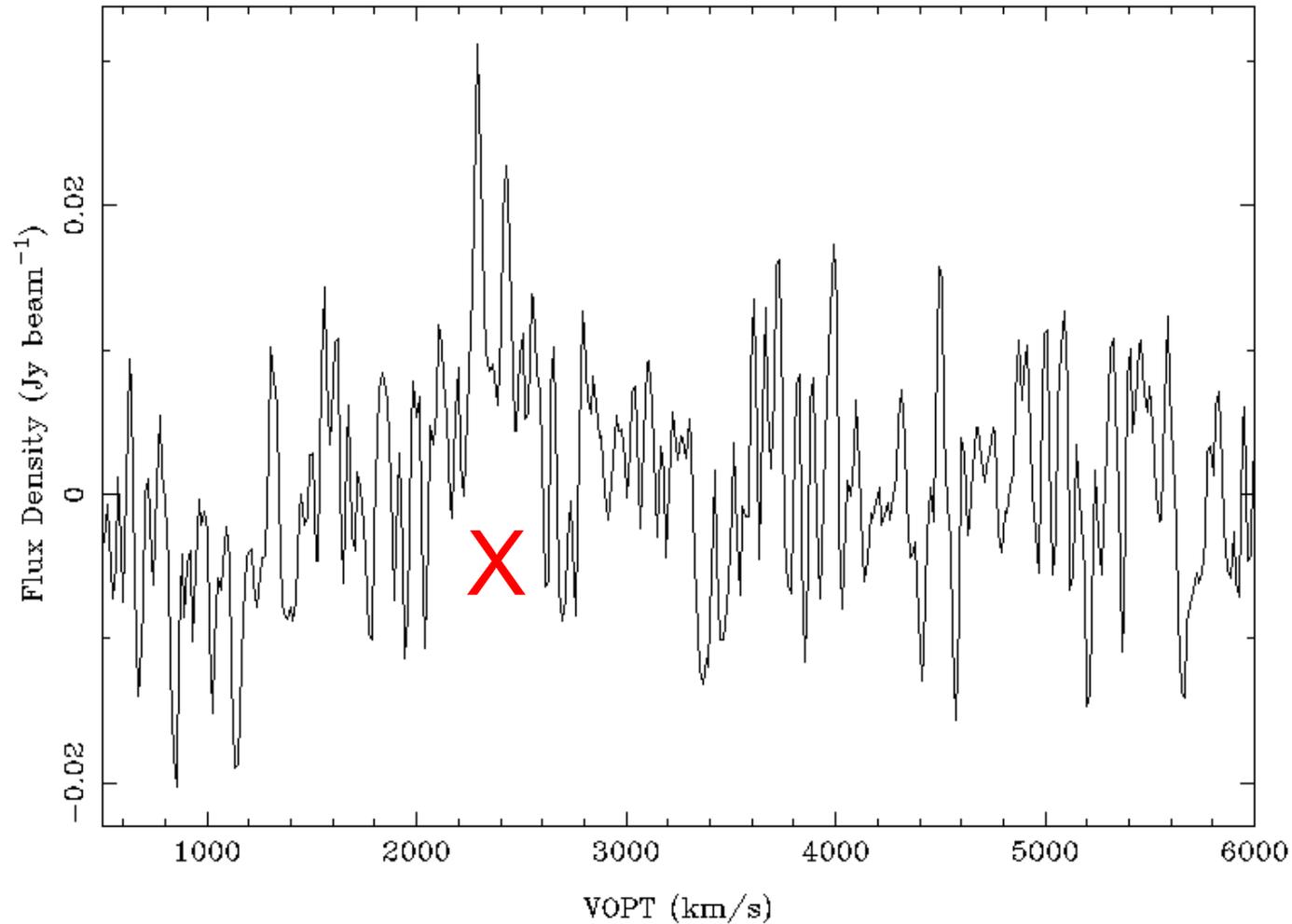
228 spirals with $K_{AB} < 10.5$
186 spirals in HI catalogues

42 spirals $f_{1.4} < 2.5$ mJy
31 spirals in HI catalogues

NGC 5188 $f_{1.4} = 95$ mJy

Object: H170
Requested: 13:31:28.00 -34:47:40.00
Actual: 13:31:28.16 -34:50:51.53
Equinox: J2000.0

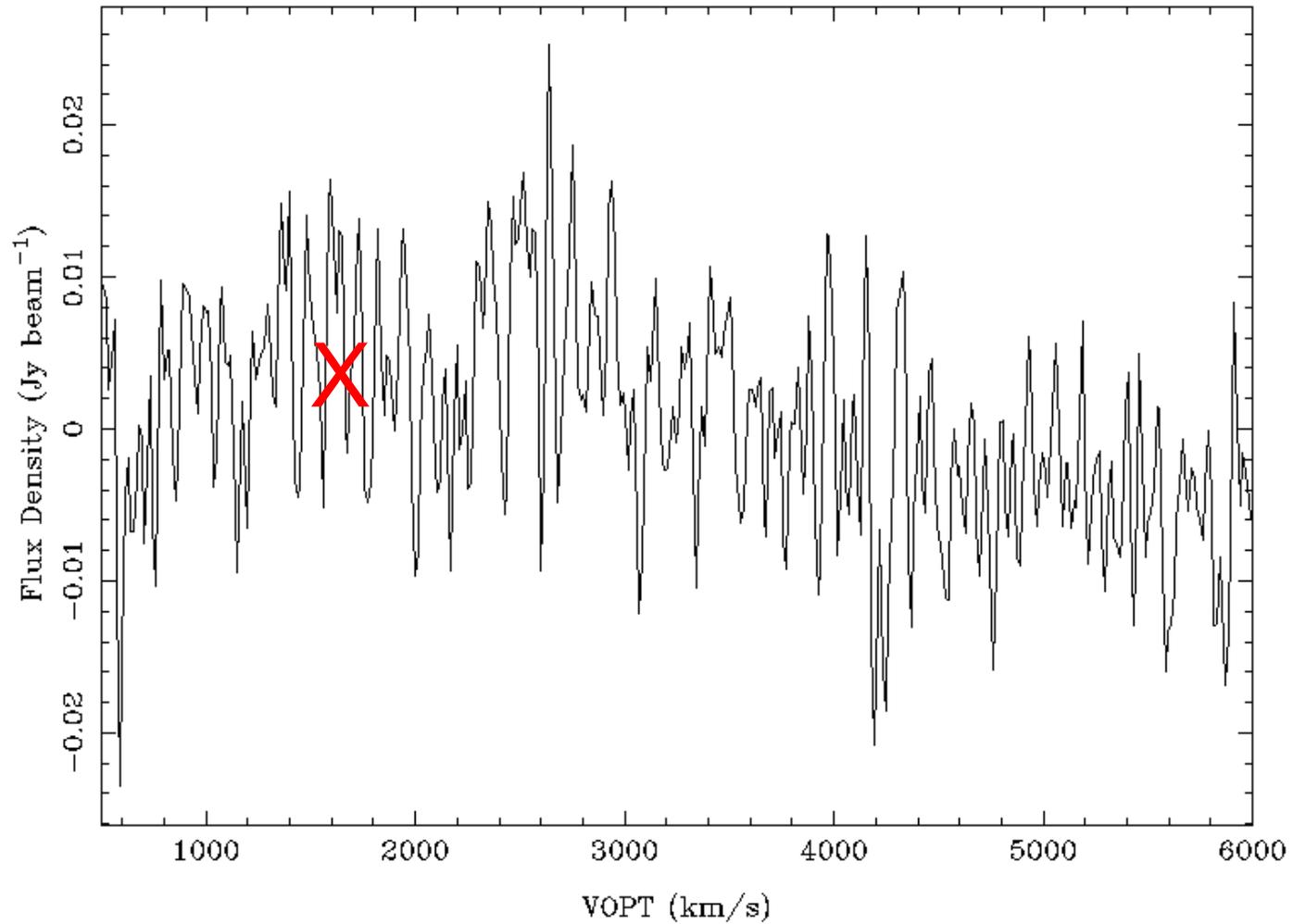
HIPASS public data release - v1.2 May 13 2000 (south)



NGC 7727 $f_{1.4} < 2.5$ mJy

Object: H335
Requested: 23:39:53.00 -12:17:35.00
Actual: 23:39:58.04 -12:21:29.31
Equinox: J2000.0

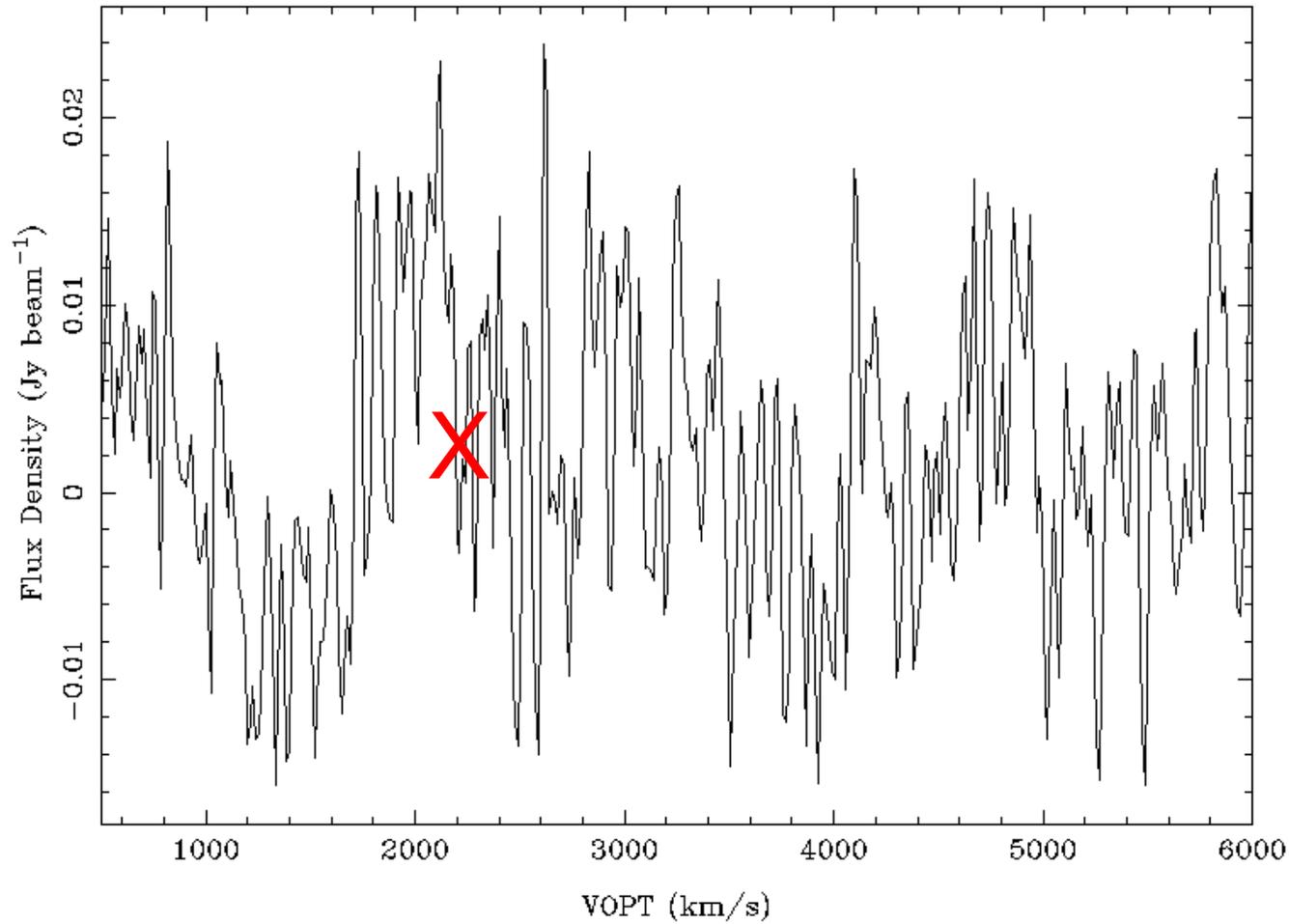
HIPASS public data release - v1.2 May 13 2000 (south)



NGC 2811 $f_{1.4} < 2.5$ mJy

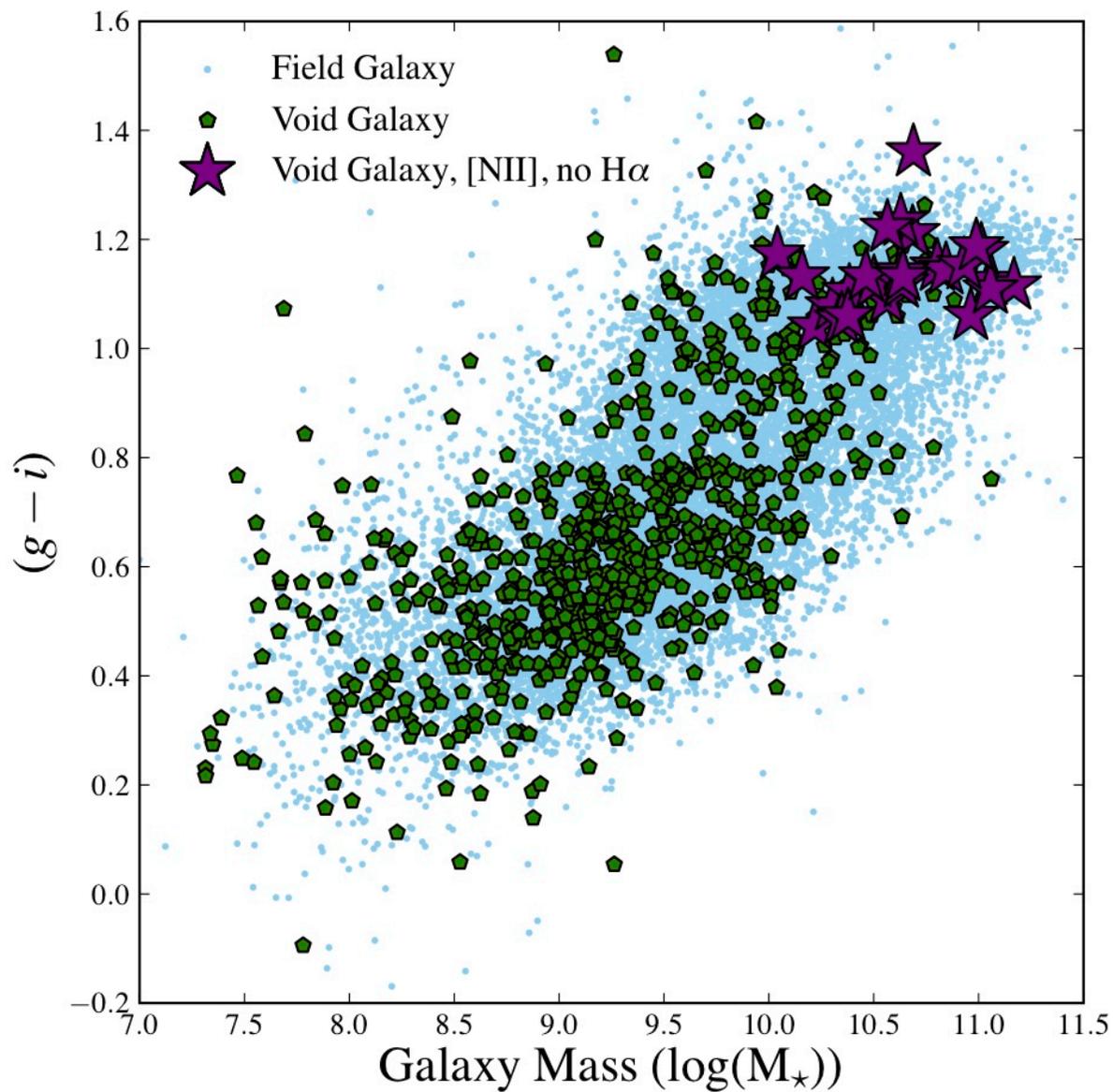
Object: H255
Requested: 09:16:11.00 -16:18:48.00
Actual: 09:15:55.33 -16:21:22.65
Equinox: J2000.0

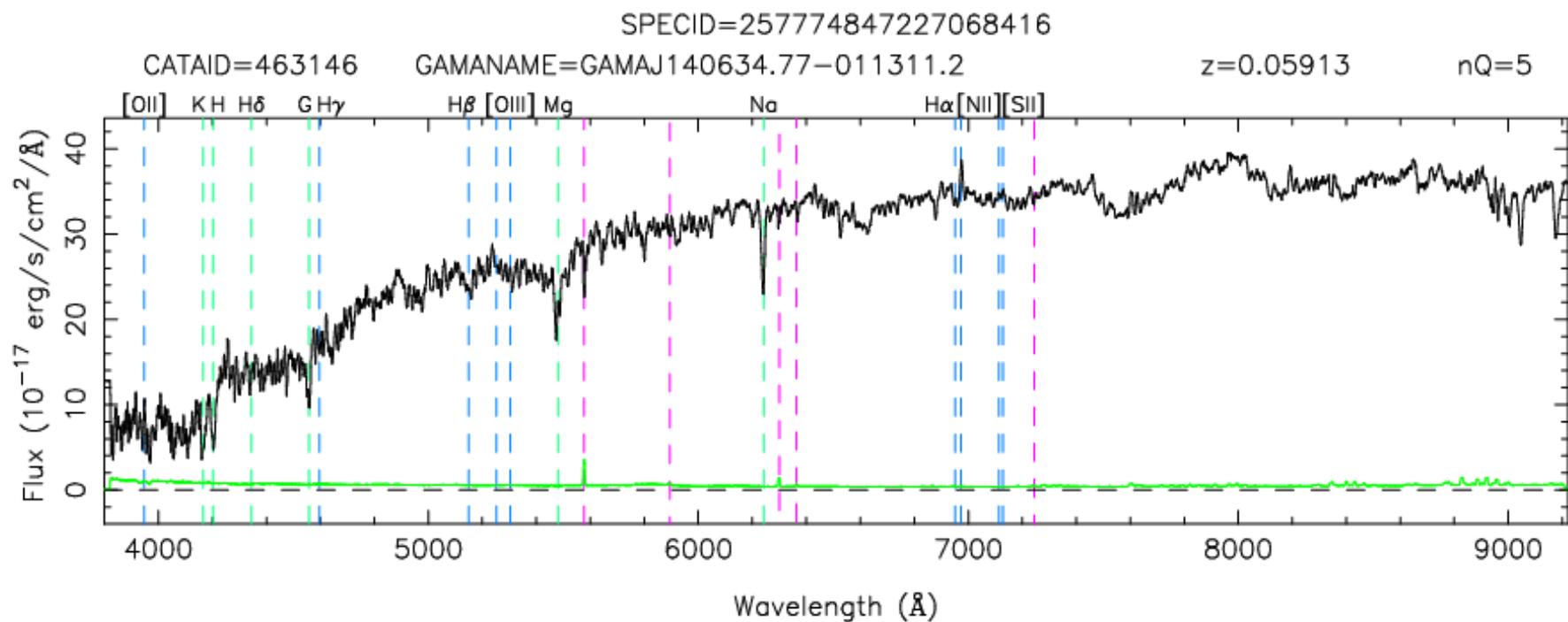
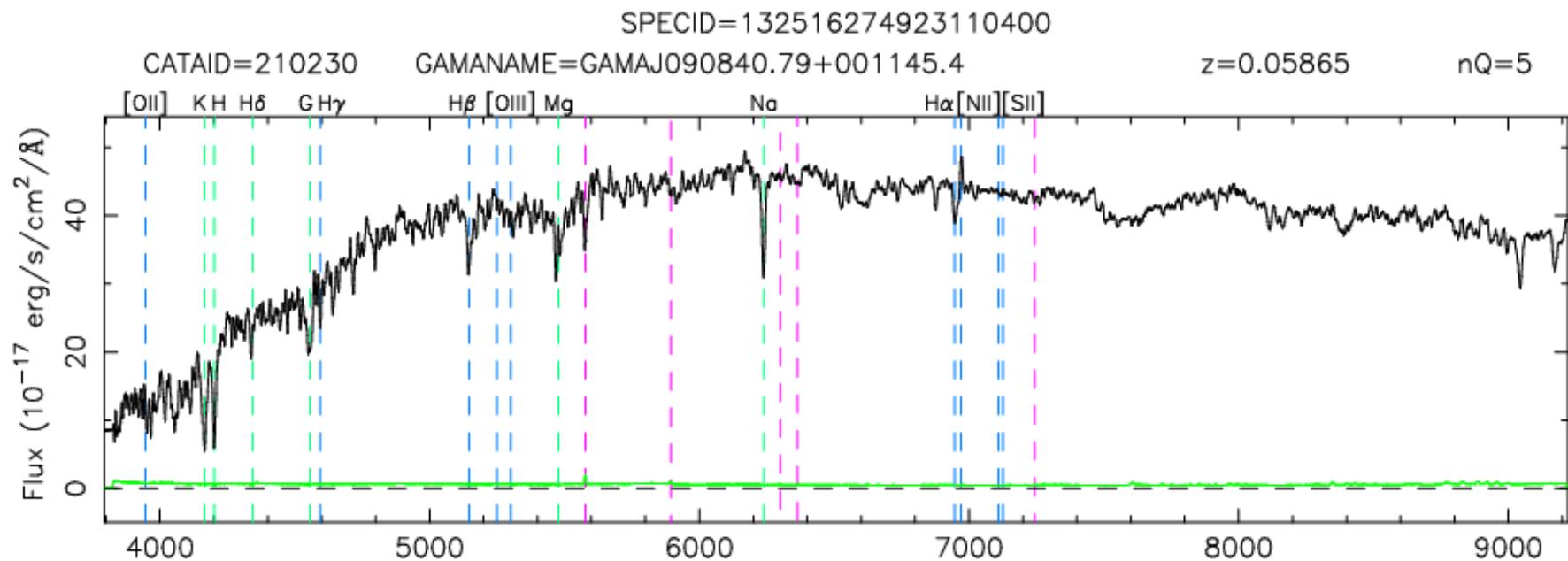
HIPASS public data release - v1.2 May 13 2000 (south)



GAMA Void Galaxies

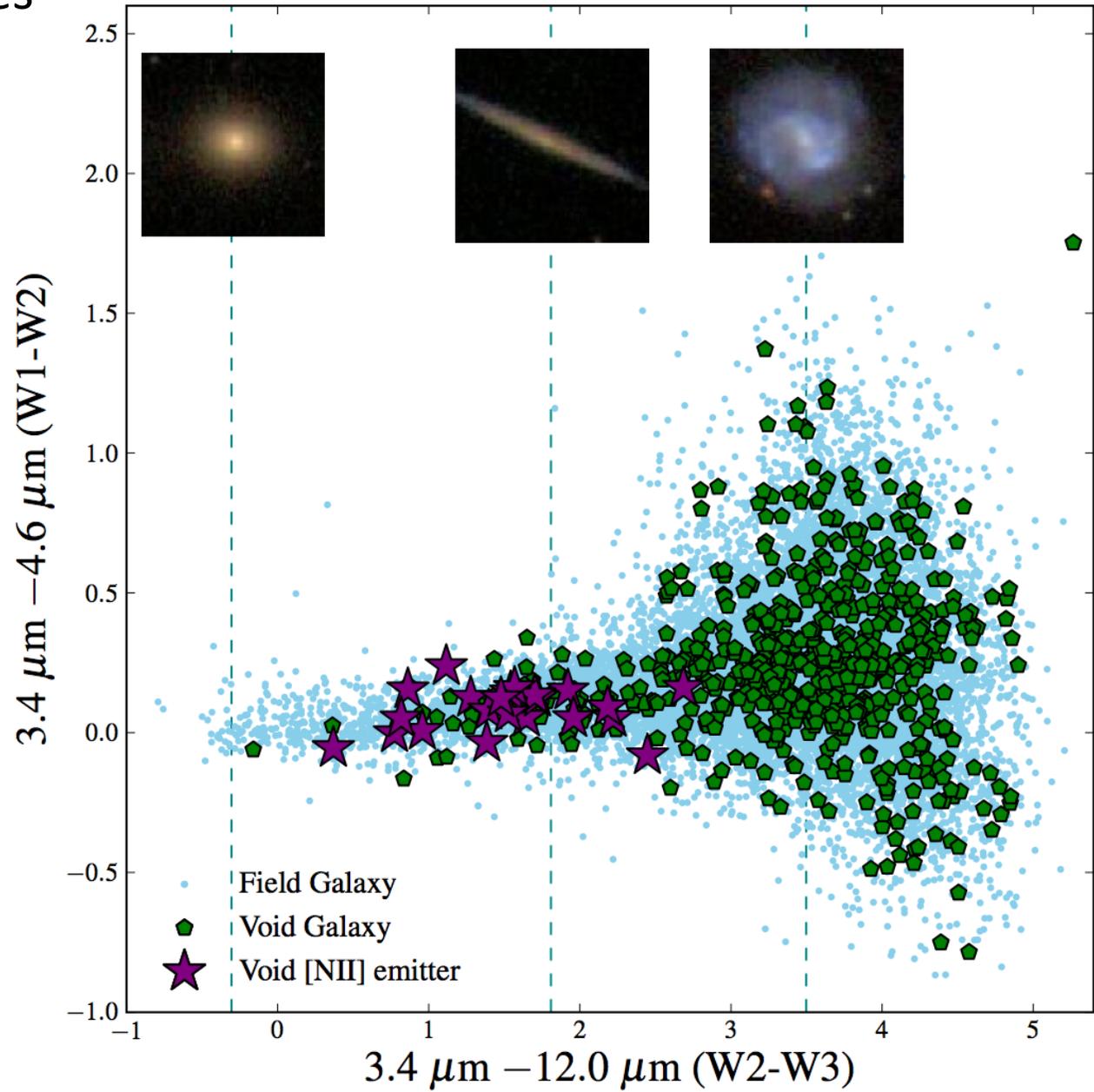
Penny et al.
(in prep)





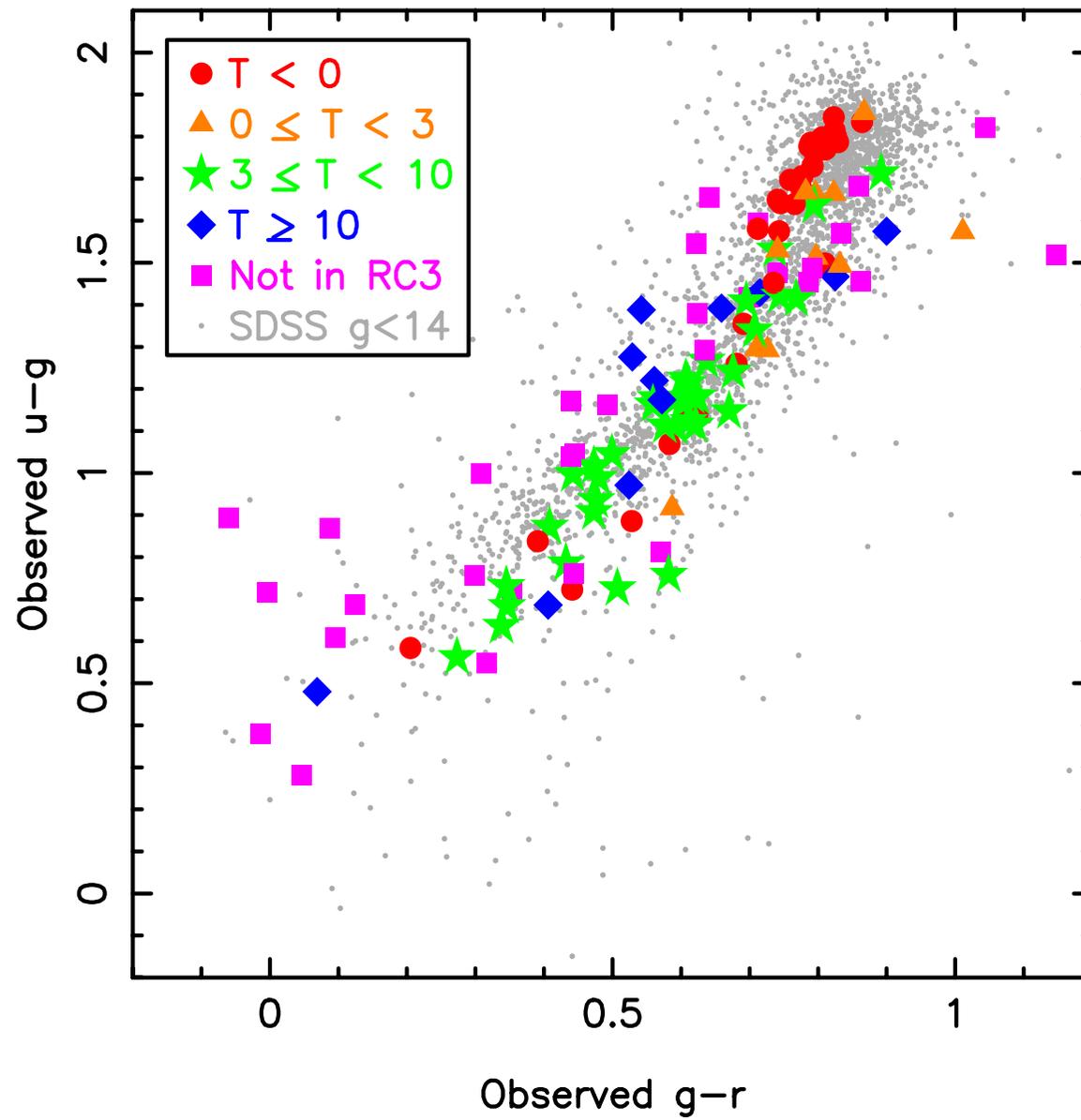
GAMA Void Galaxies

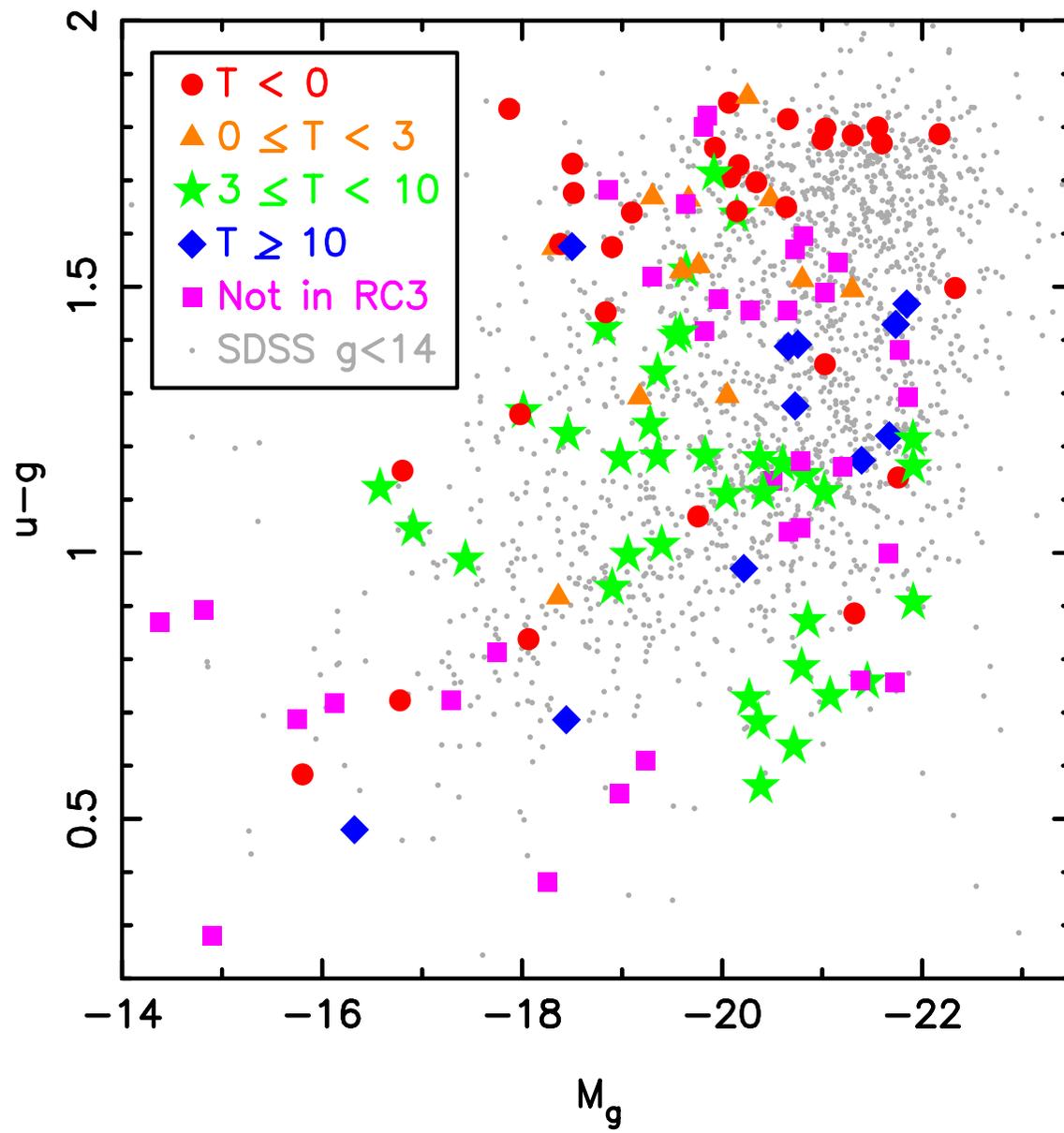
Penny et al.
(in prep)

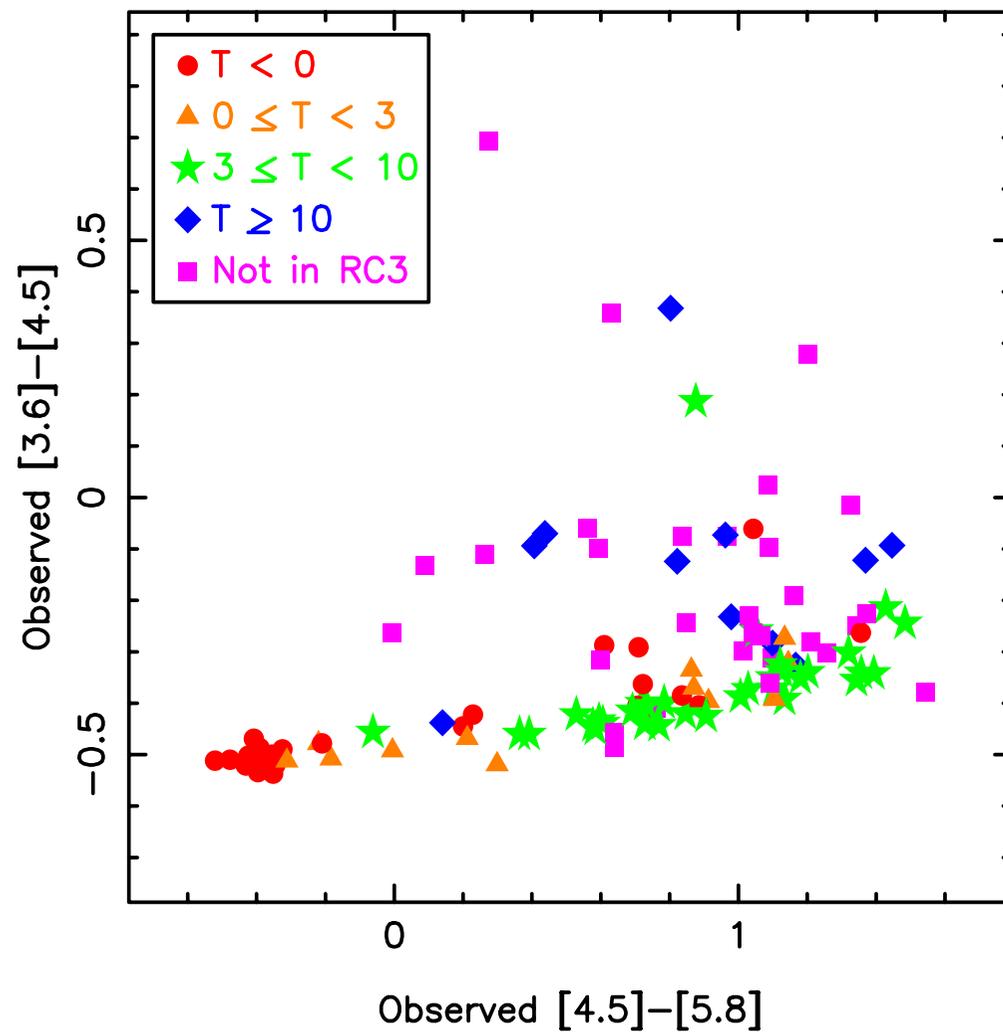


Summary

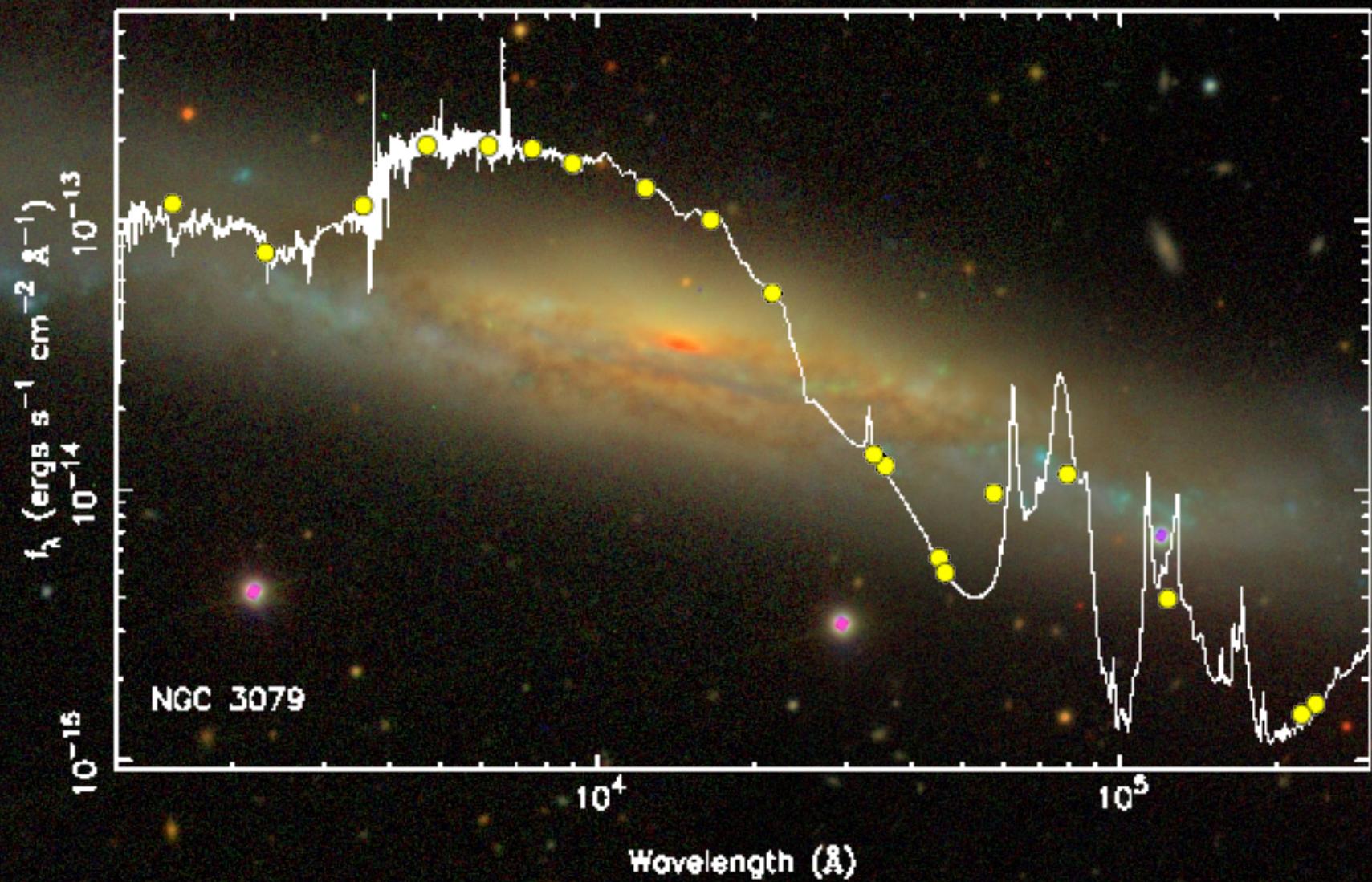
- Red spirals are not recently faded blue spirals.
 - Red spirals fraction increases with mass (Bonne etc).
- High and low SFR spirals live in similar halos
 - The large-scale clustering is similar (Dolley).
- Low SFR spirals are not passive spirals
 - SFR in the disk, Infrared excess, PAH emission, HI
- Red void galaxies have ongoing SF (Penny).
- Is truncation of SF only possible in Ellipticals?



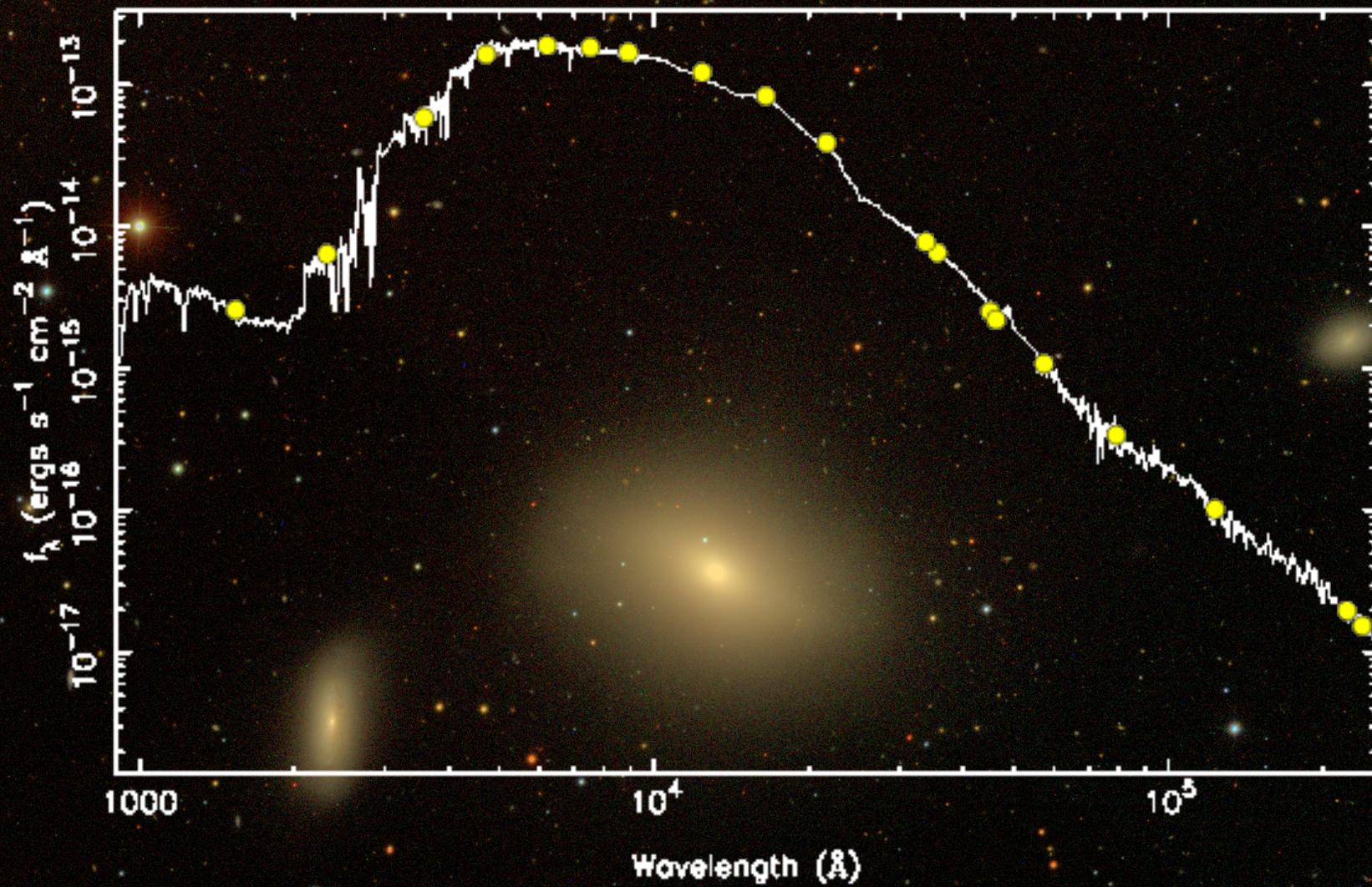




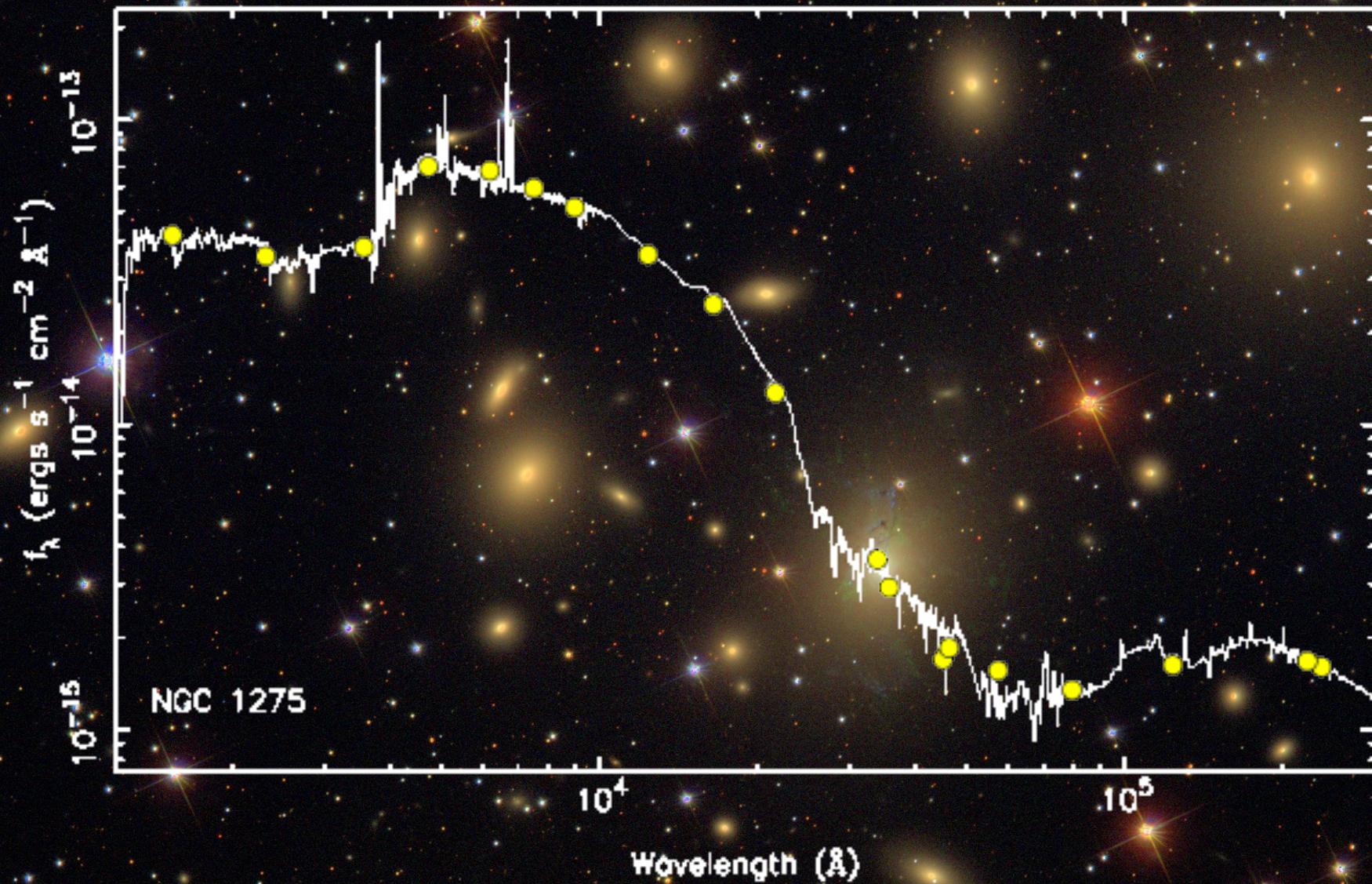
NGC 3079



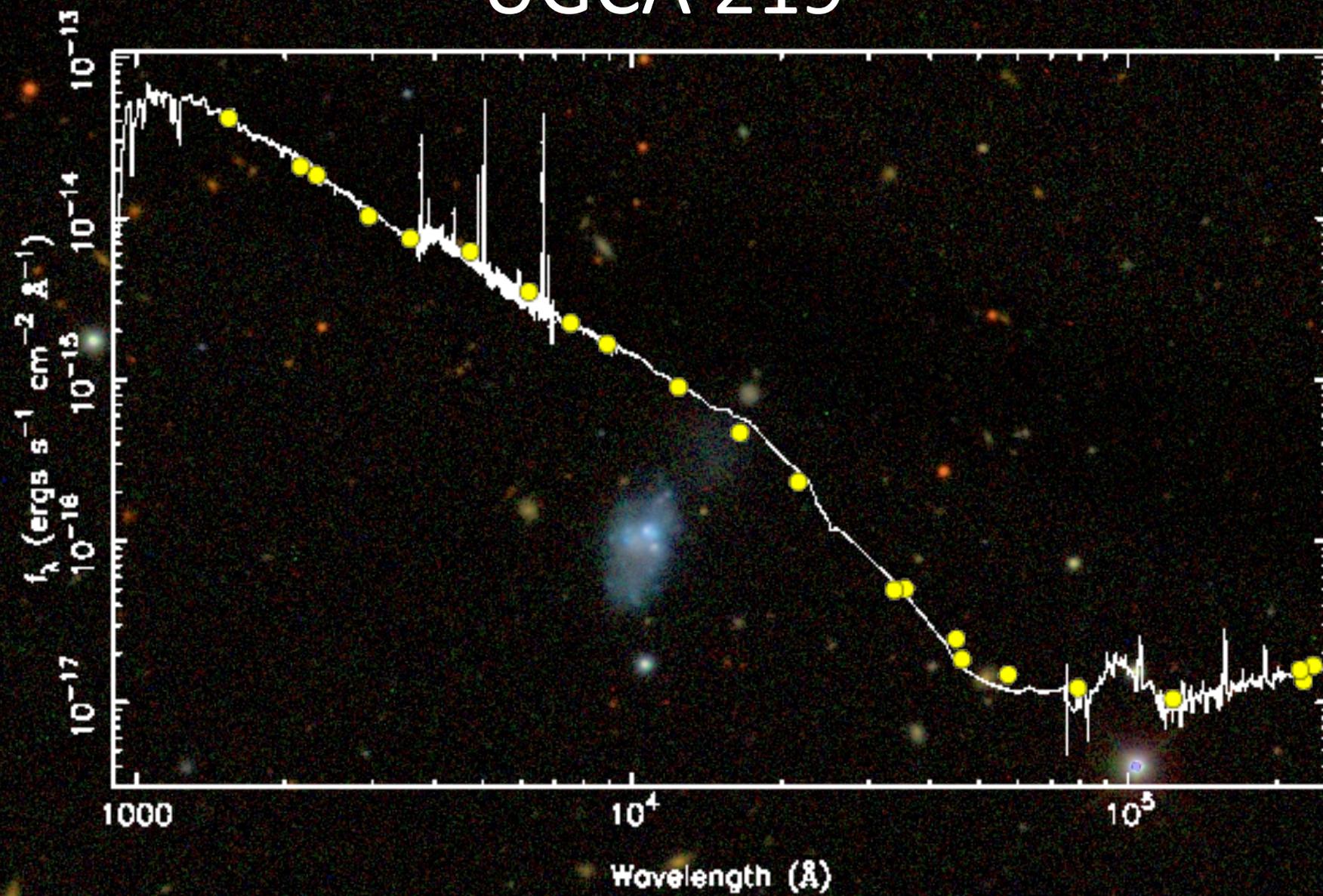
NGC 584



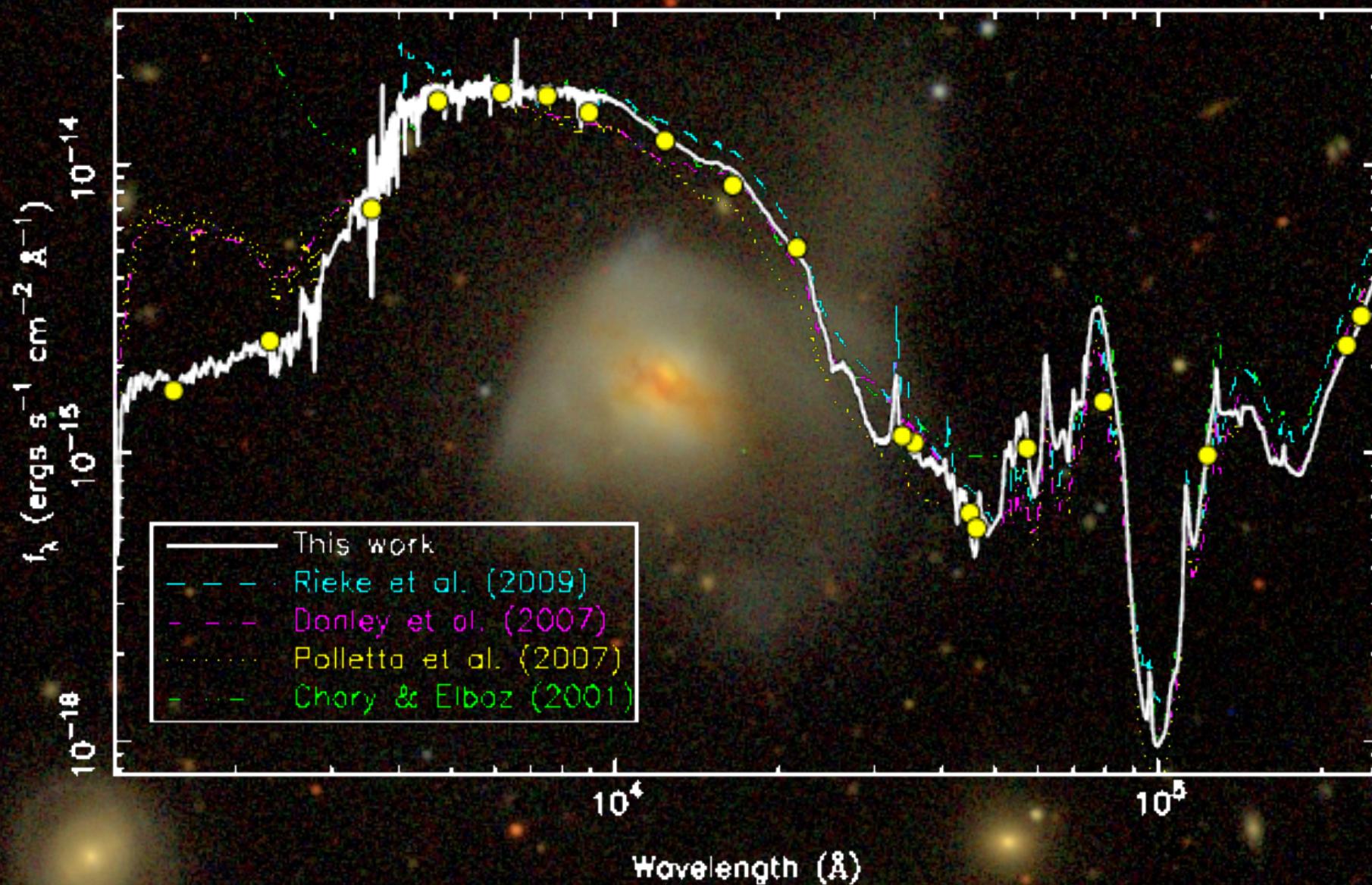
NGC 1275



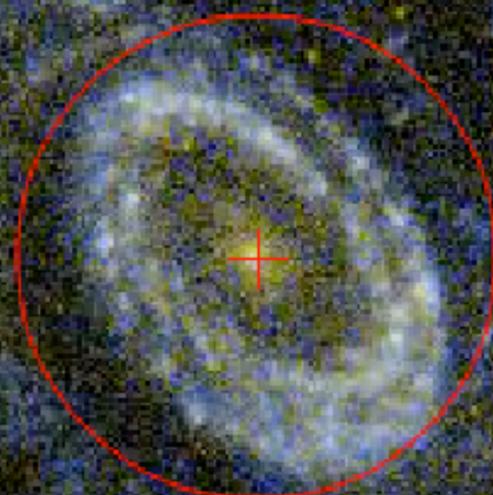
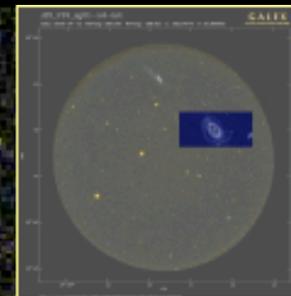
UGCA 219



IC 4553 / Arp 220



AIS_219



(Double click an object to display its properties)

