

HeViCS

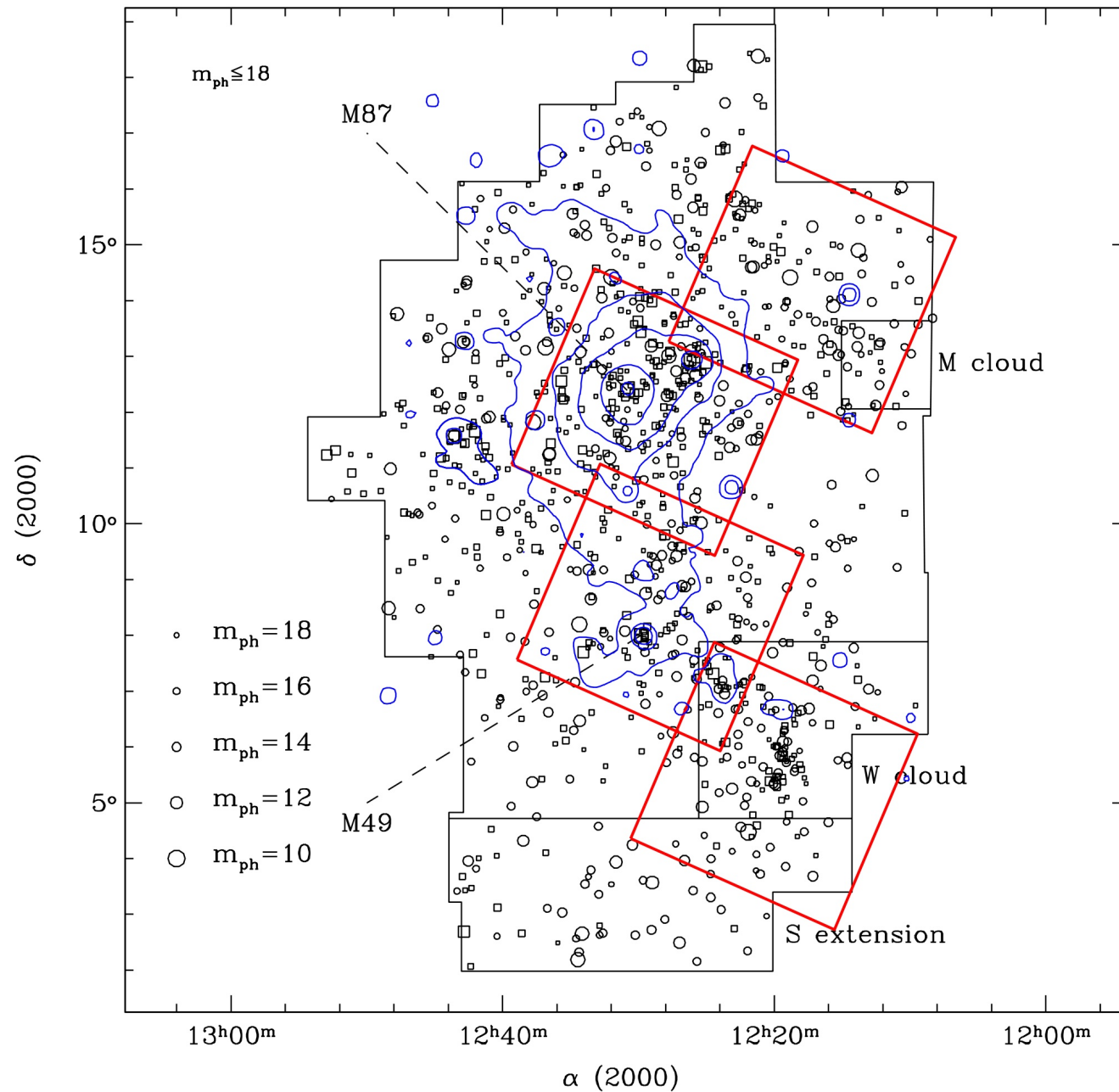
the Herschel Virgo Cluster Survey

Simone Bianchi

(INAF-Osservatorio Astrofisico di Arcetri, Florence)

on behalf of the HeViCS Consortium:

Jonathan Davies (Principal Investigator), R. Auld, M. Baes, G. J. Bendo, S. Bianchi, H. Boehringer, D. Bomans, A. Boselli, P. Chanial, M. Clemens, E. Corbelli, L. Cortese, A. Dariush, I. De Looze, S. Dye, S. Eales, D. Fadda, J. Fritz, D. Garcia-Appadoo, G. Gavazzi, C. Giovanardi, M. Grossi, T. Hughes, L. Hunt, A. Jones, S. Madden, D. Pierini, M. Pohlen, M. Putman, S. Sabatini, M. Smith, S. di Serego Alighieri, J. Verstappen, C. Vlahakis, E. Xilouris, S. Zibetti



Survey Area
 $\approx 60 \text{ deg}^2$

PACS/SPIRE
 parallel mode
 fast scanning

PACS B (100- μm)
 PACS R (160- μm)
 SPIRE (250, 350, 500- μm)

286 hours

1- σ = 1 MJy/sr
 at 250- μm
 Confusion limit
 For SPIRE

VCC (Binggeli et al. 1985)
 ROSAT (Bohringer et al. 1994)

Science topics for HeViCS

- Dust in the intracluster medium
- Cold dust in the extreme outskirts of galaxies
- Environmental effects on dust content of galaxies
- The FIR/summ luminosity function in the cluster
- Modelling the SED & the mass of cold dust
- Dust vs morphology: spirals, elliptical, dE, BCD...
- Unusual objects & background galaxies.

Some addressed in SDP works

SDP data

field centered on
Virgo's centre

$\frac{1}{4}$ of the field
 $\frac{1}{4}$ of the exposure

PACS

100 μm

160 μm

$\approx 4^\circ$

fwhm $\approx 9''$
 $1-\sigma = 8.6 \text{ MJy/sr}$

fwhm $\approx 13''$
 $1-\sigma = 4.9 \text{ MJy/sr}$

SPIRE

250 μm

350 μm

500 μm

fwhm $\approx 18''$
 $1-\sigma = 1.3 \text{ MJy/sr}$

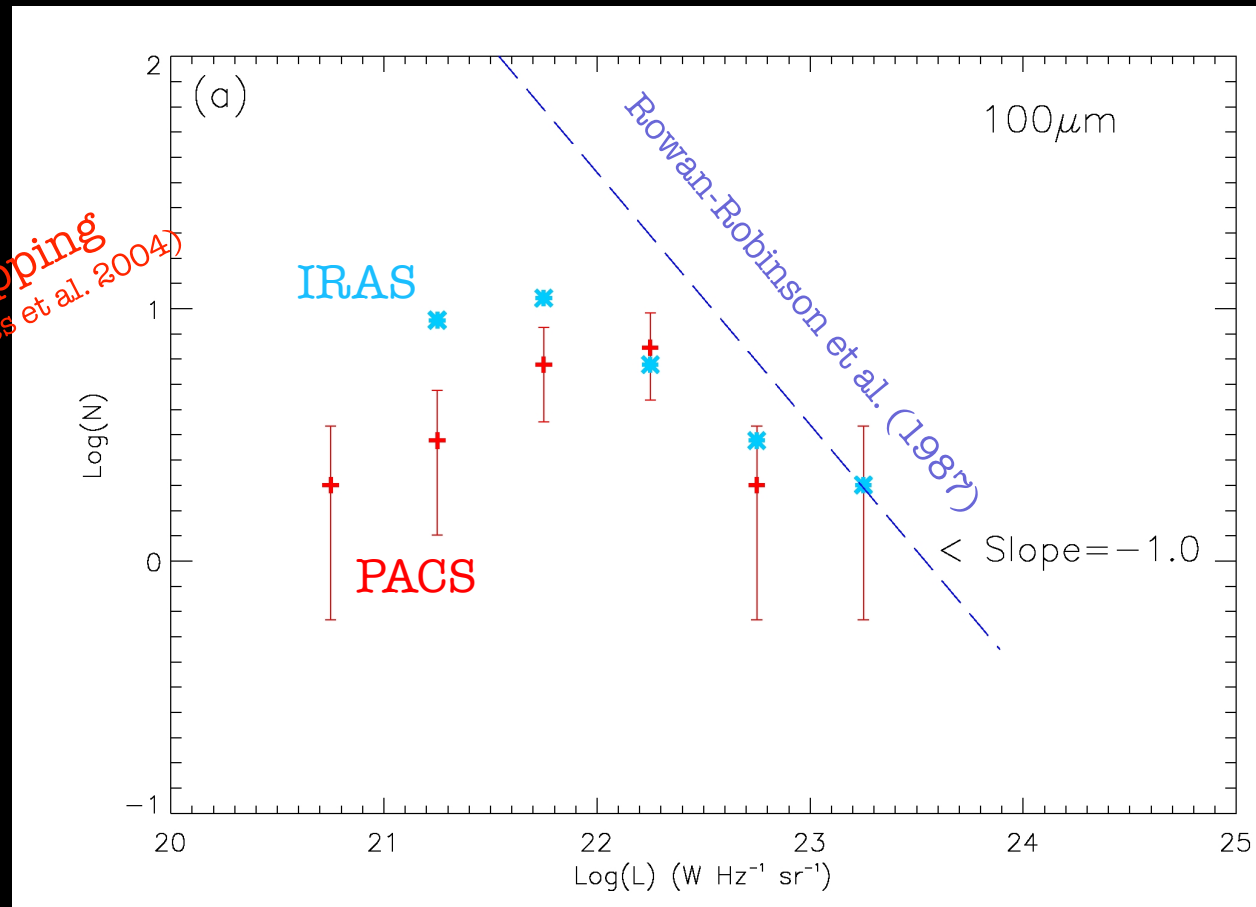
fwhm $\approx 25''$
 $1-\sigma = 0.6 \text{ MJy/sr}$

fwhm $\approx 37''$
 $1-\sigma = 0.3 \text{ MJy/sr}$

HeViCS: I. Luminosity Functions

J. I. Davies et al. (2010)

24 galaxies selected at $500\mu\text{m}$ with $\Theta > 1.4'$ and $S_{500} > 0.2 \text{ Jy}$
10% of the VCC (Binggeli et al. 1985) galaxies in the field

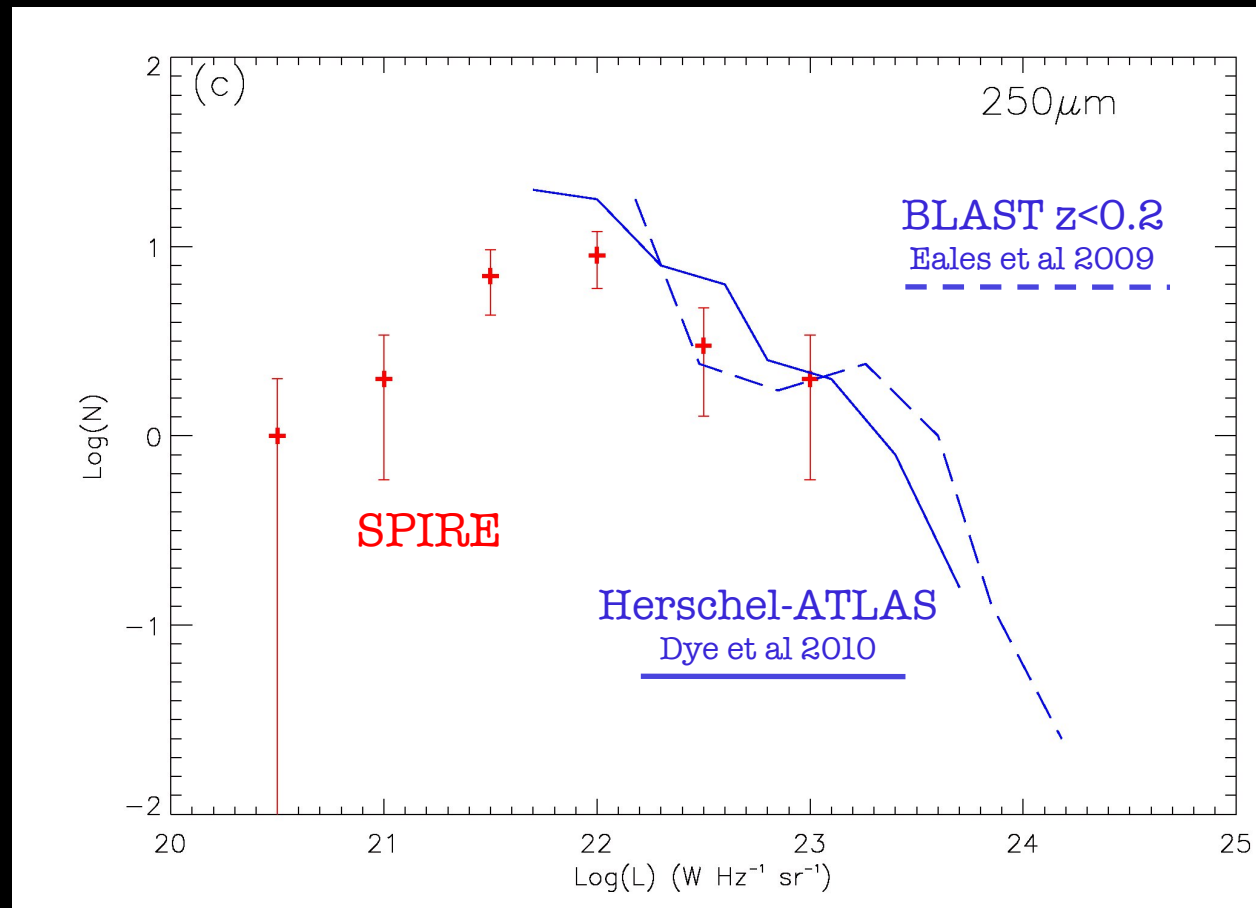


Dust stripping
(as for gas; Davies et al. 2004)

HeViCS: I. Luminosity Functions

J. I. Davies et al. (2010)

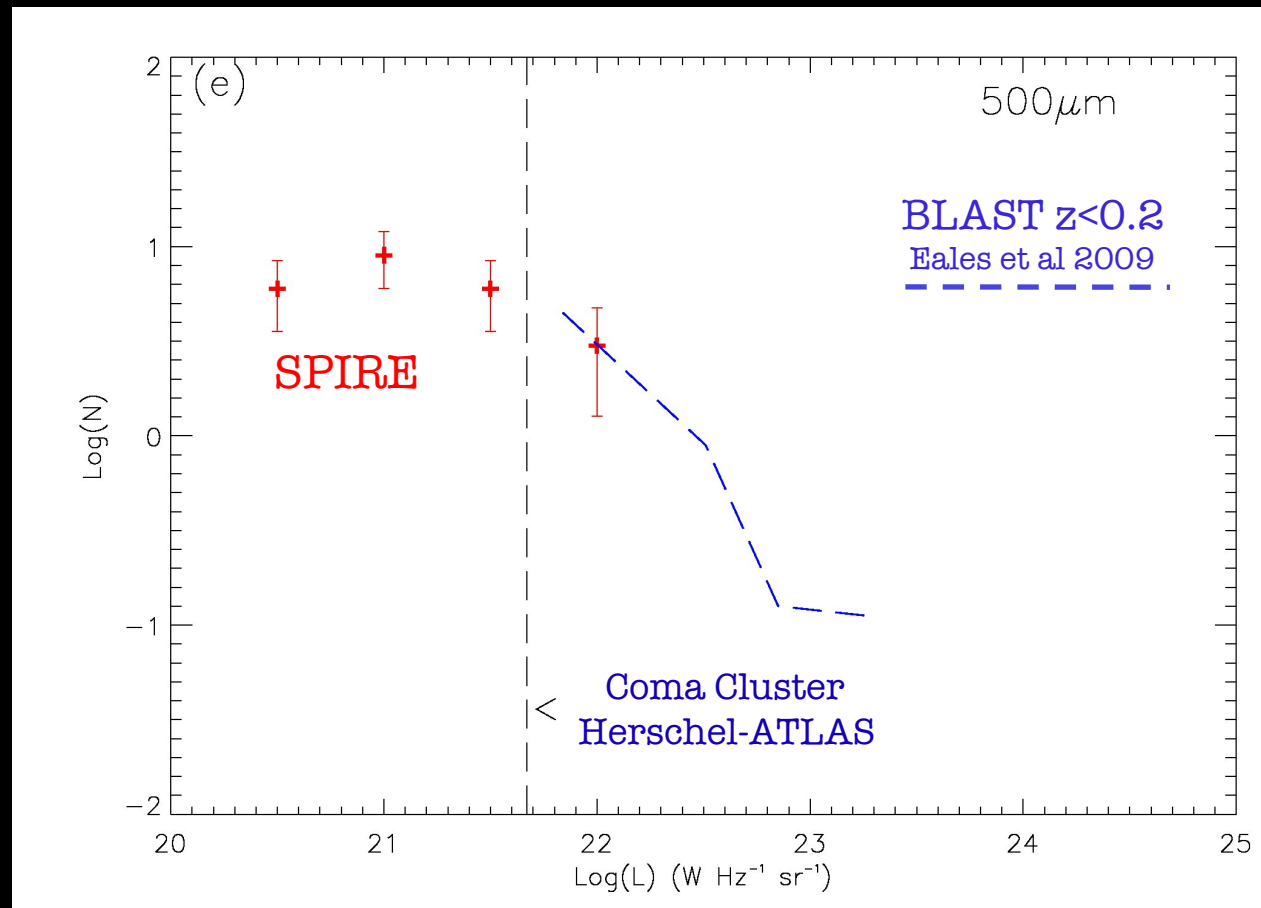
24 galaxies selected at $500\mu\text{m}$ with $\Theta > 1.4'$ and $S_{500} > 0.2 \text{ Jy}$
10% of the VCC (Binggeli et al. 1985) galaxies in the field



HeViCS: I. Luminosity Functions

J. I. Davies et al. (2010)

24 galaxies selected at $500\mu\text{m}$ with $\Theta > 1.4'$ and $S_{500} > 0.2$ Jy
10% of the VCC (Binggeli et al. 1985) galaxies in the field

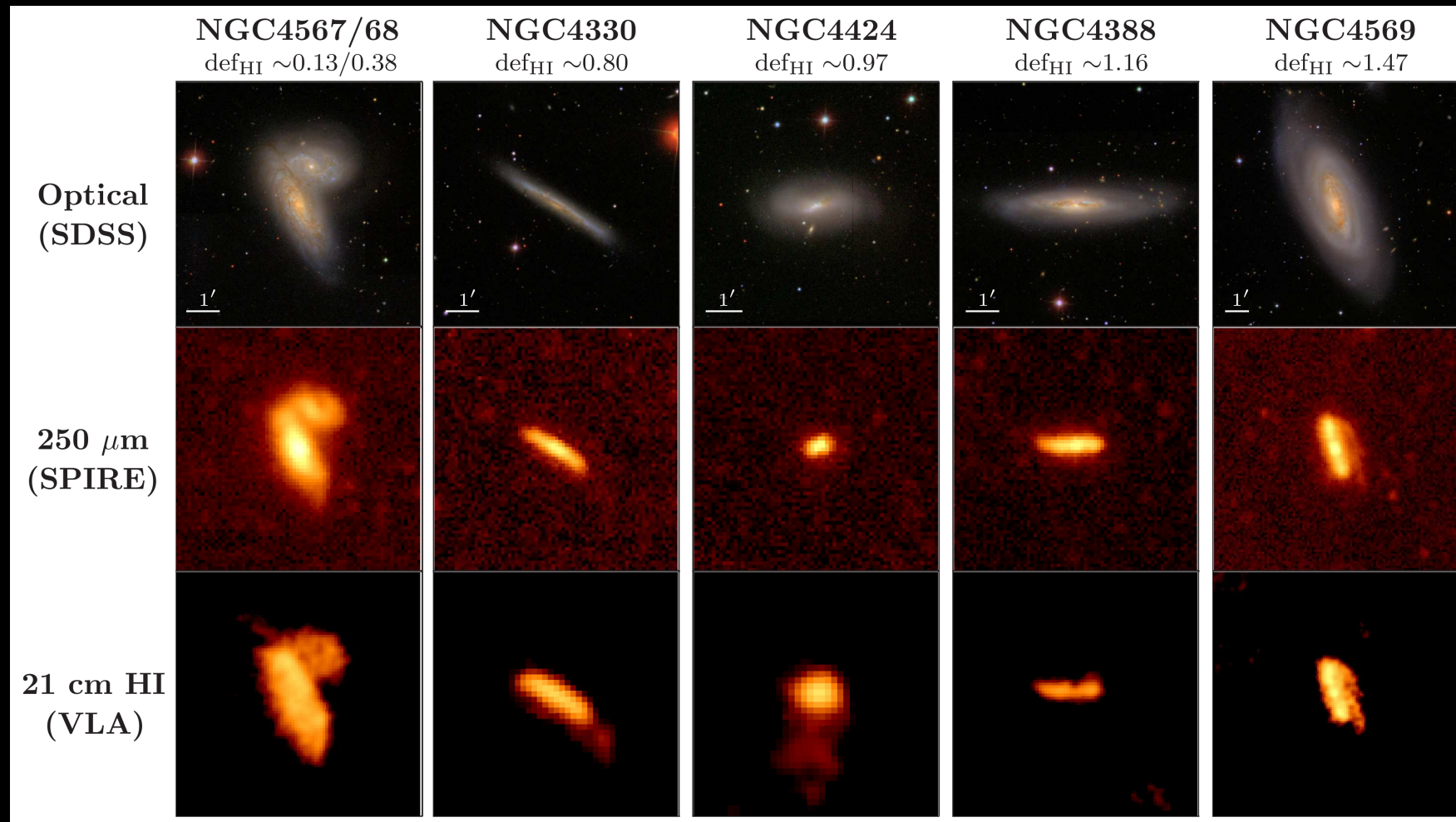


HeViCS: II.

Previous Talk!

Truncated dust disks in HI-deficient spirals

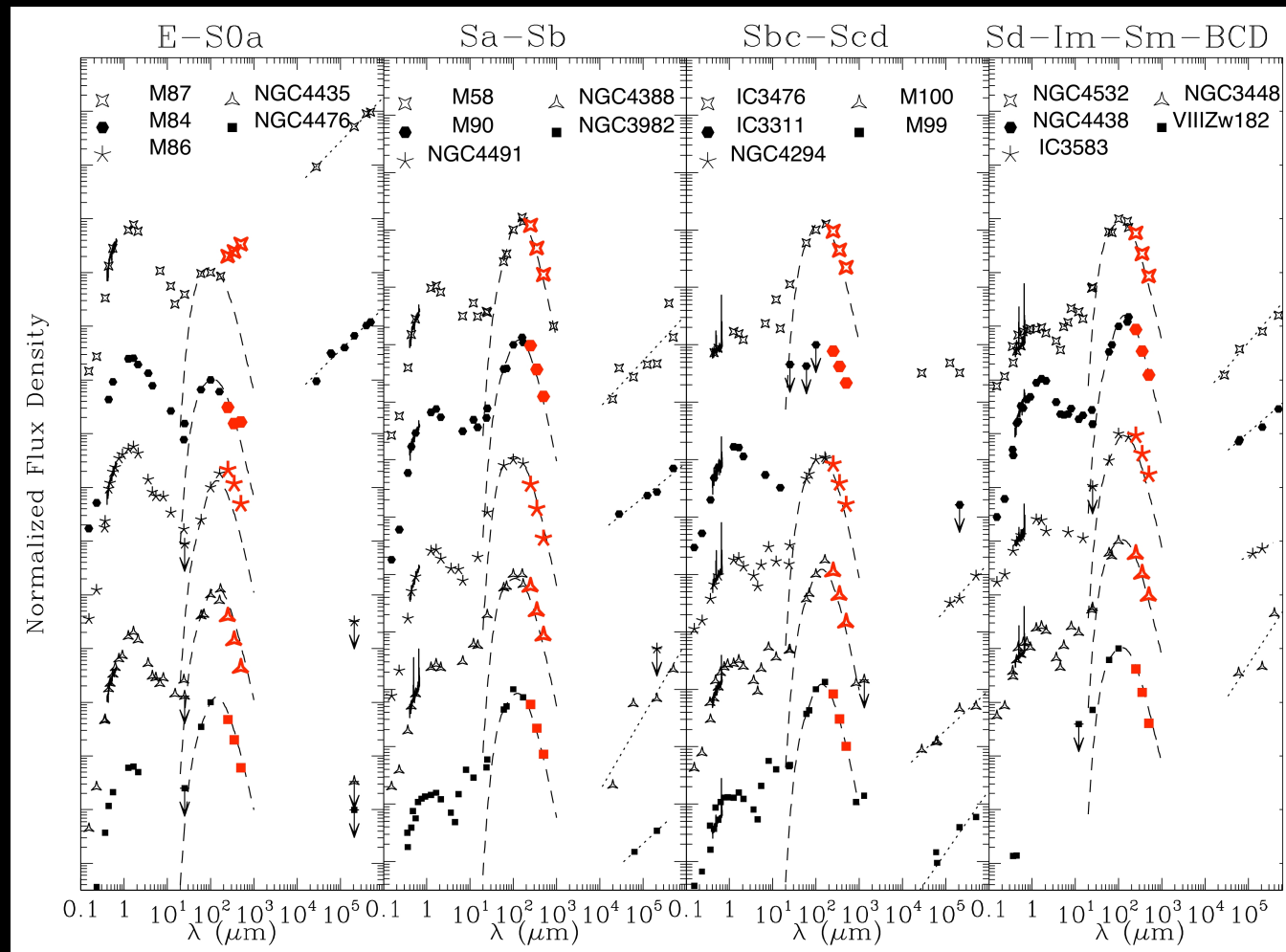
L. Cortese et al. (2010)



FIR colours and SEDs of nearby galaxies observed with Herschel

A. Boselli et al. (2010)

*Talk in the
previous session*

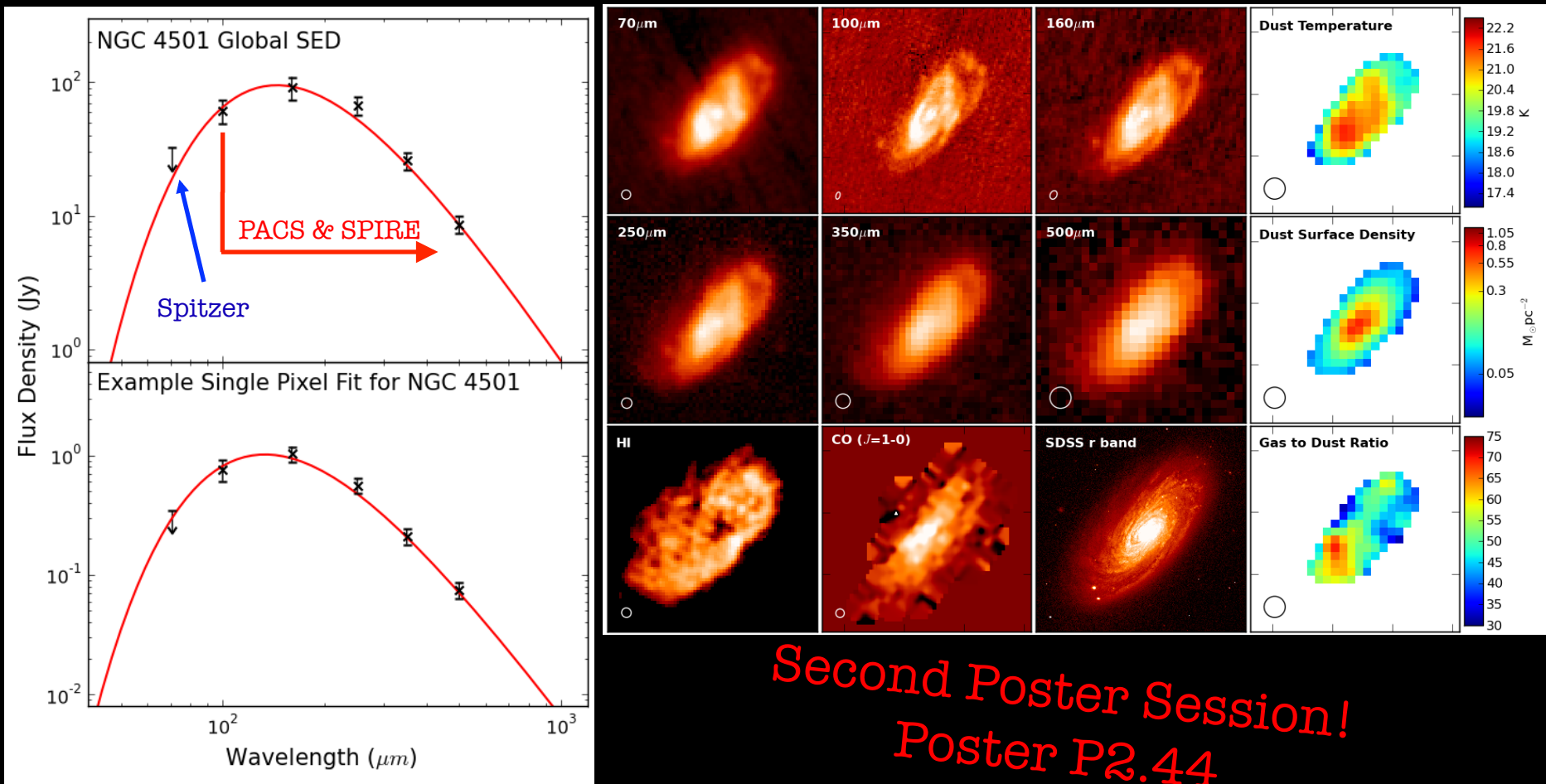


SPIRE DATA from HeViCS and HRS

HeViCS: IV. Resolved Dust Analysis of Spiral Galaxies

M. W. L. Smith et al. (2010)

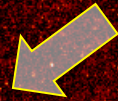
Two galaxies: **NGC4501 (M88)** and NGC4567/8



Second Poster Session!
Poster P2.44

SPIRE @ 250 μ m

“The Virgo Cluster – Home of M87”
(Binggeli 1999)

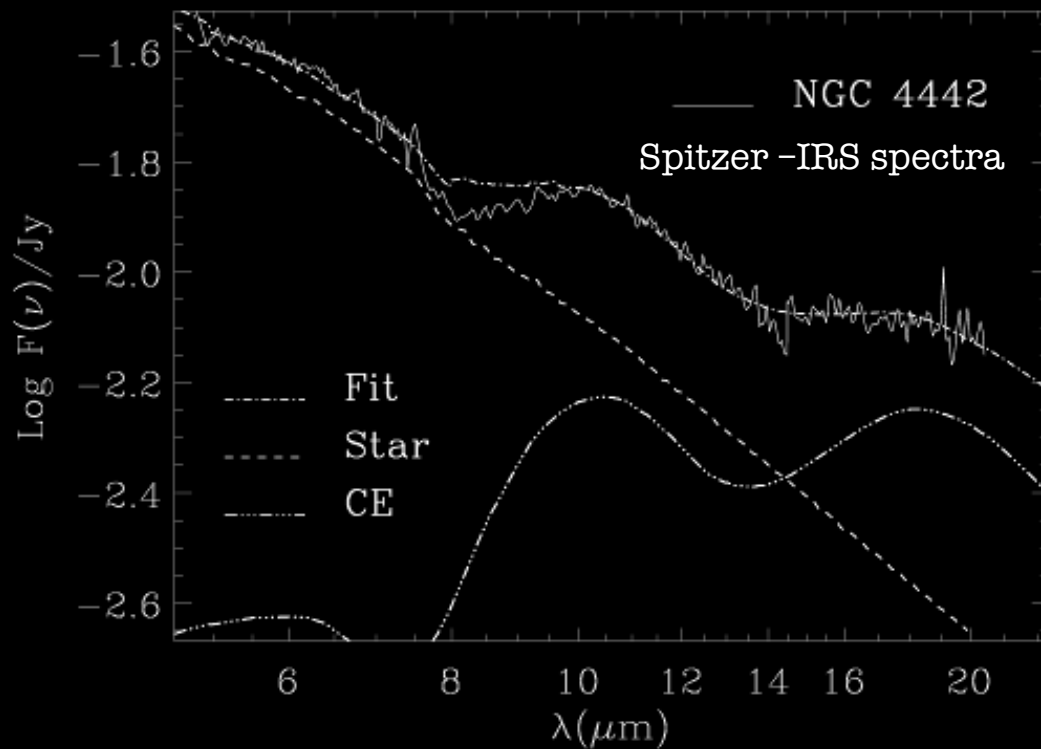


Next Talk!

HeViCS: VI.
The far-infrared view of M87
M. Baes et al. (2010)

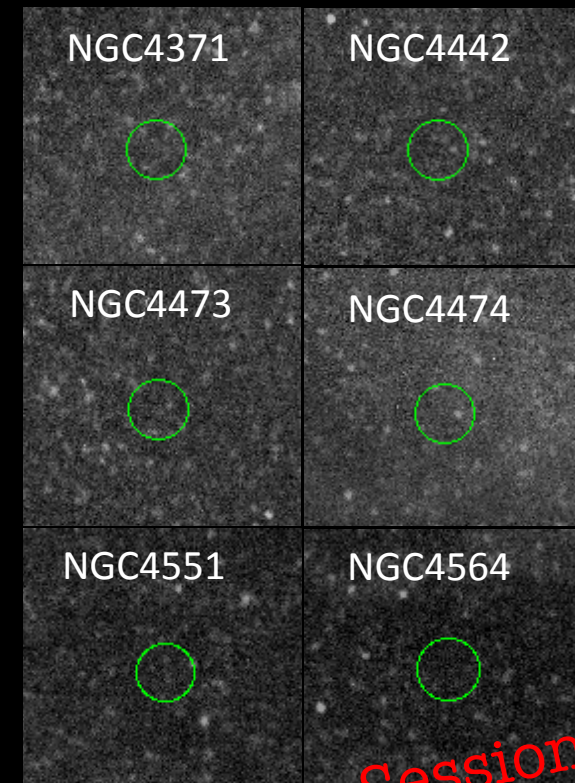
HeViCS: III. A constraint on dust grain lifetime in early-type galaxies

M. S. Clemens et al. (2010)



$$\text{Grain Lifetime} = M_{\text{dust}} / (dM_{\text{dust}}/dt) < 46 \pm 25 \text{ Myrs}$$

Truly passively evolving
ETG are not detected

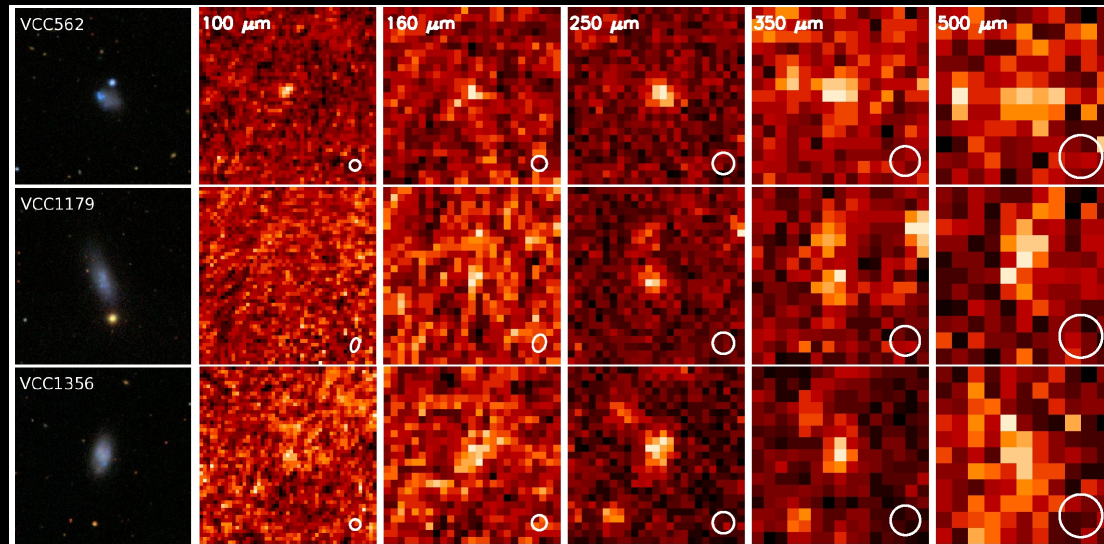


First Poster Session!
Poster P1.37

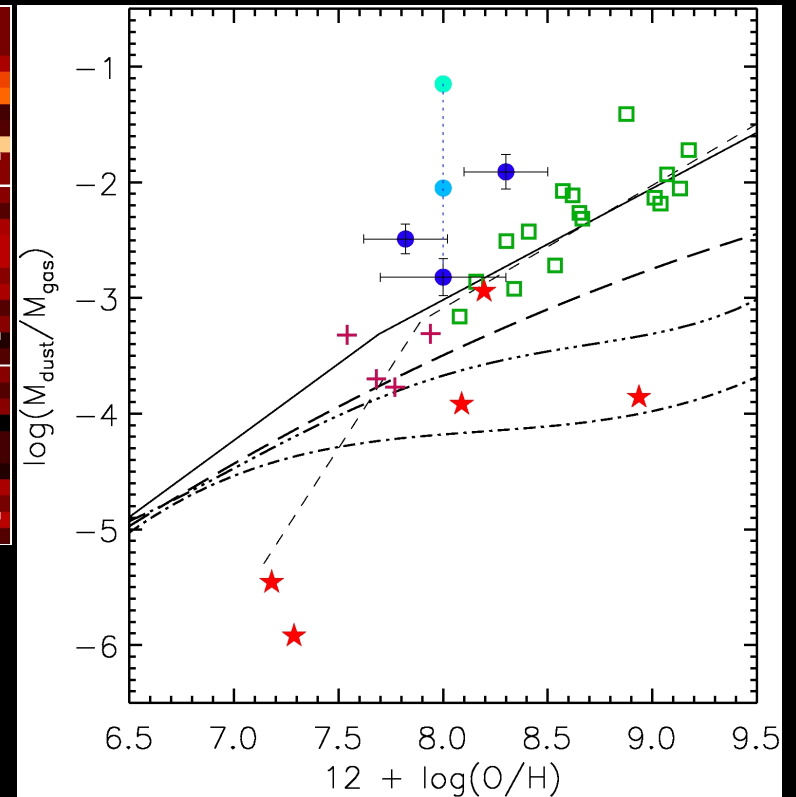
HeViCS: V. Star-forming dwarf galaxies – dust in metal-poor environment

Grossi et al. (2010)

3 (out of 6) blue compact dwarfs detected



$M=10^5 M_{\odot}$ $T=16-20\text{K}$



First Poster Session!
Poster P1.38

SPIRE @ 250 μ m

VCC 781

VCC 951

Talk in this session!

HeViCS: VII.

Dust in cluster dwarf elliptical galaxies

I. De Looze et al. (2010)

Conclusions

What we achieved with 1/16 of the data:

- Measurement of cluster sub-mm luminosity function
 - Detection of environment effects on dust
- Study of the dependence of the FIR/submm SED on morphology
- Derivation of temperature & dust density maps in resolved objects
 - Estimate of dust lifetime in early type galaxies
 - Mass estimate in 3 low-metallicity BCDs

Plus what you are going to hear in the next two talks!

Thanks to all Herschel, PACS & SPIRE people!

Details on HeViCS (proposal, papers – when allowed!) on

www.hevics.org