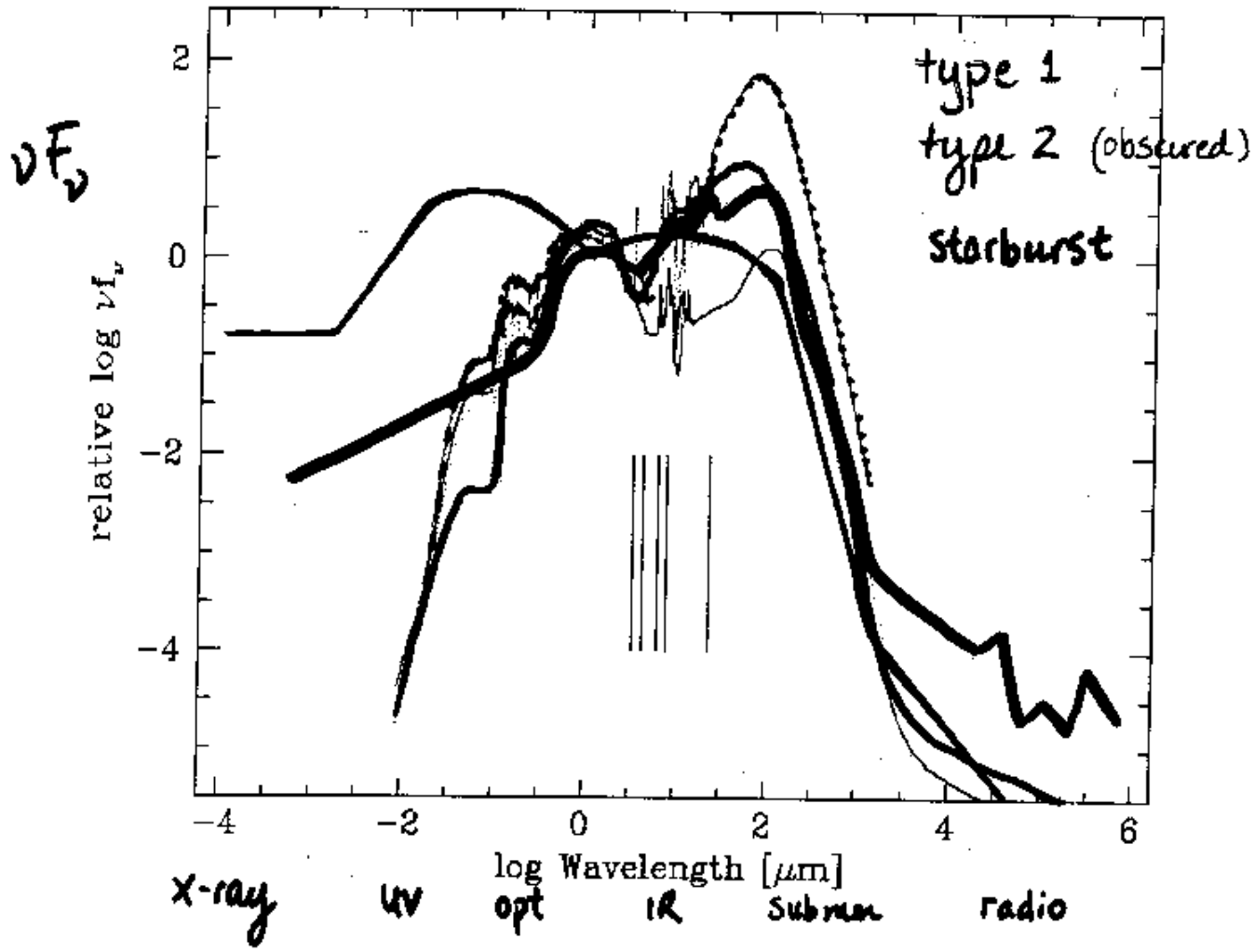
URRY

AGN

- Host galaxies
- OBSCURED AGN
- Eddington ratios, $\dot{M}$, η

ACS: spatial resolution + sensitivity

N.B. AGN Rare → area more than sens.
+ Bright


νF_ν
type 1
type 2 (obscured)
Starburst
relative log νf_ν
2
0
−2
−4
−4
−2
0
2
4
6
log Wavelength [μm]
X-ray
UV
opt
IR
Submm
radio

use IR + X-ray + optical

more bands → photometric z

ACS : detect/separate point source from galaxy

IR (+ rest) → BOLOMETRIC L.

(hard) X-ray → AGN power

need SED library (incl. em. lines)

host galaxies:

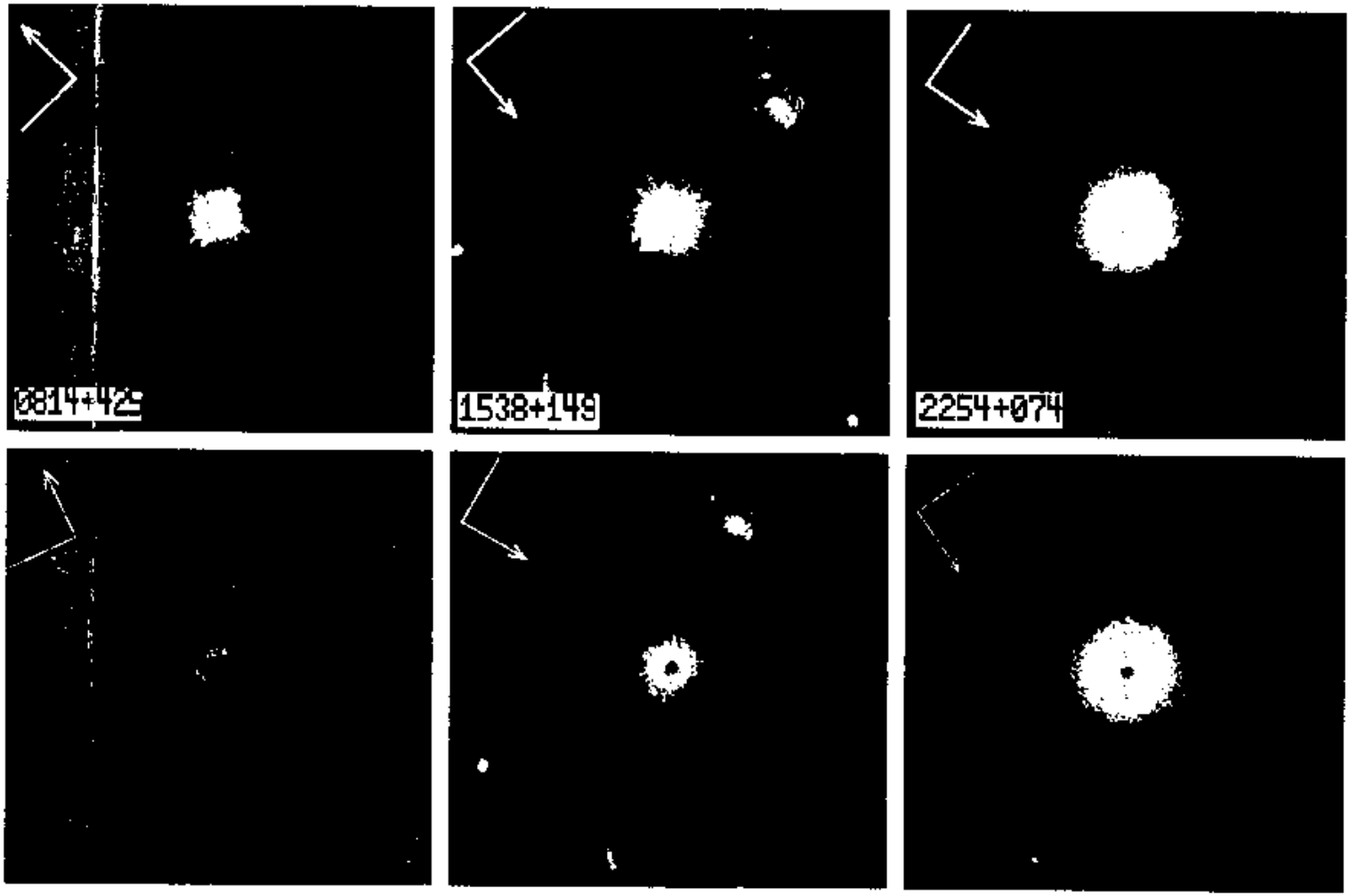
$(1+z)^4$ dimming

2 orbits ACS, detect L_* host

to $z \sim 1\text{-}2$ if type 1

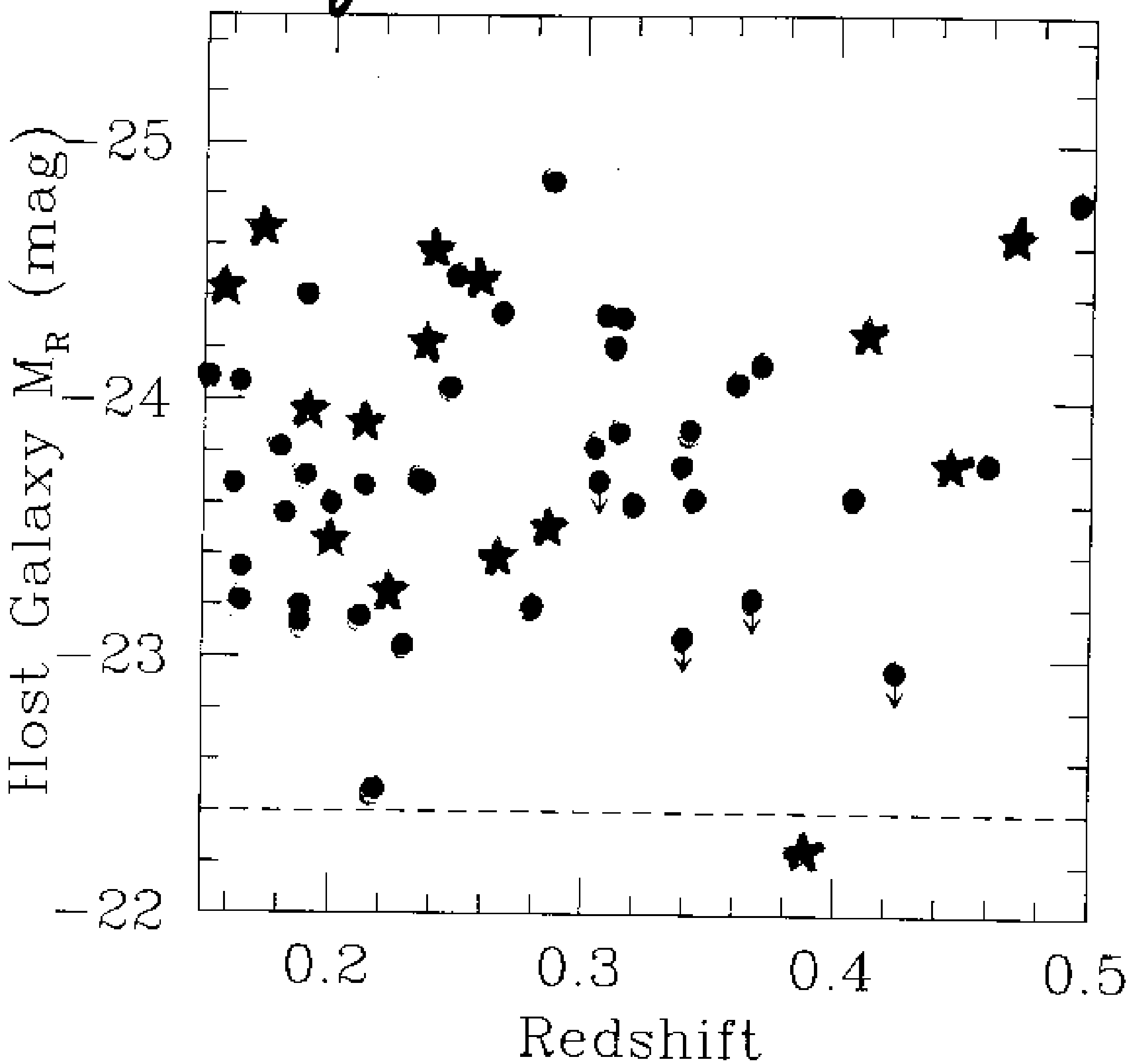
to $z \sim 2\text{-}3$ if type 2

~100 AGN in 0.3 deg^2



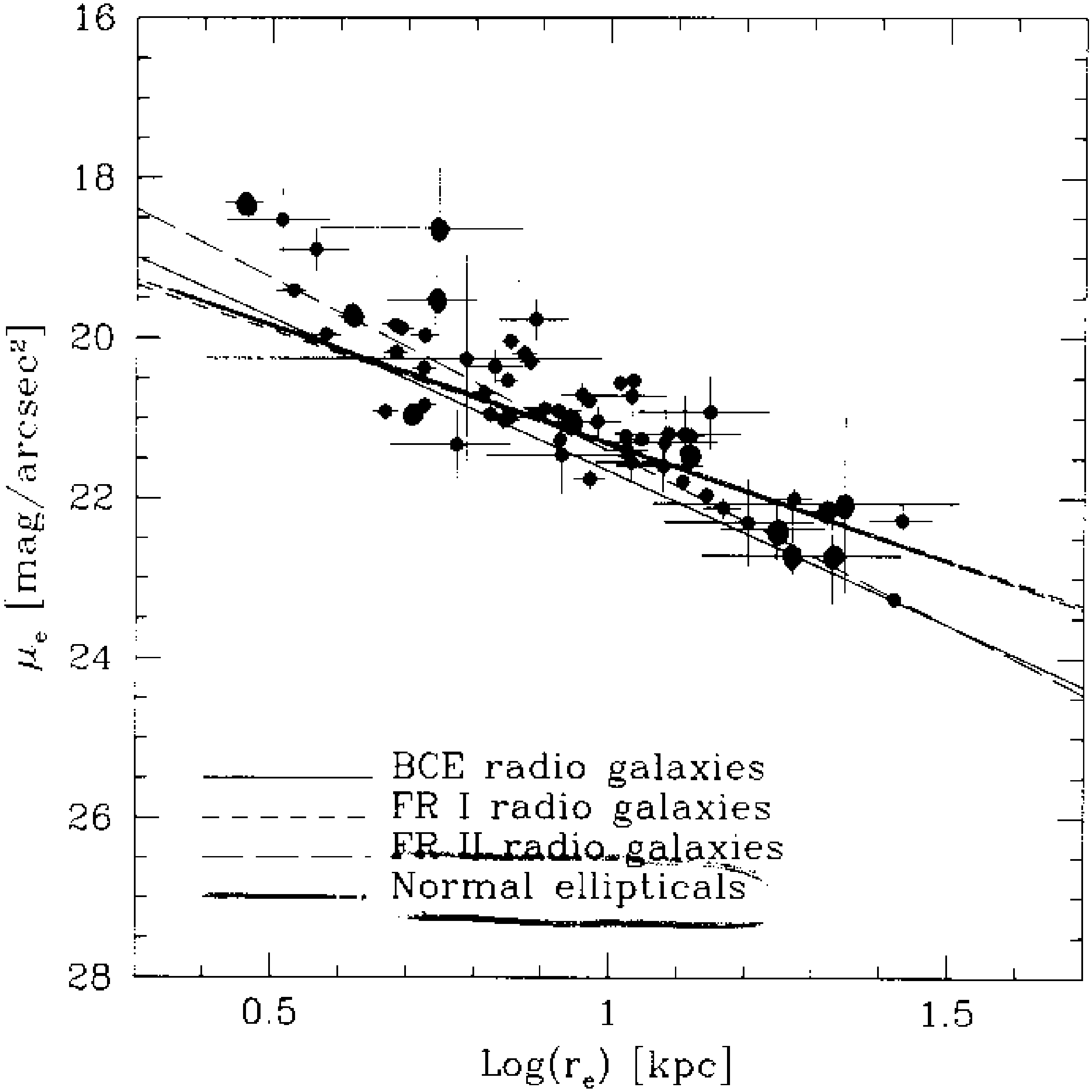
Scalpa, CMU, Palomo, ...

Host Galaxy magnitudes of RL quasars Feb. 1995



O'Dowd et al.

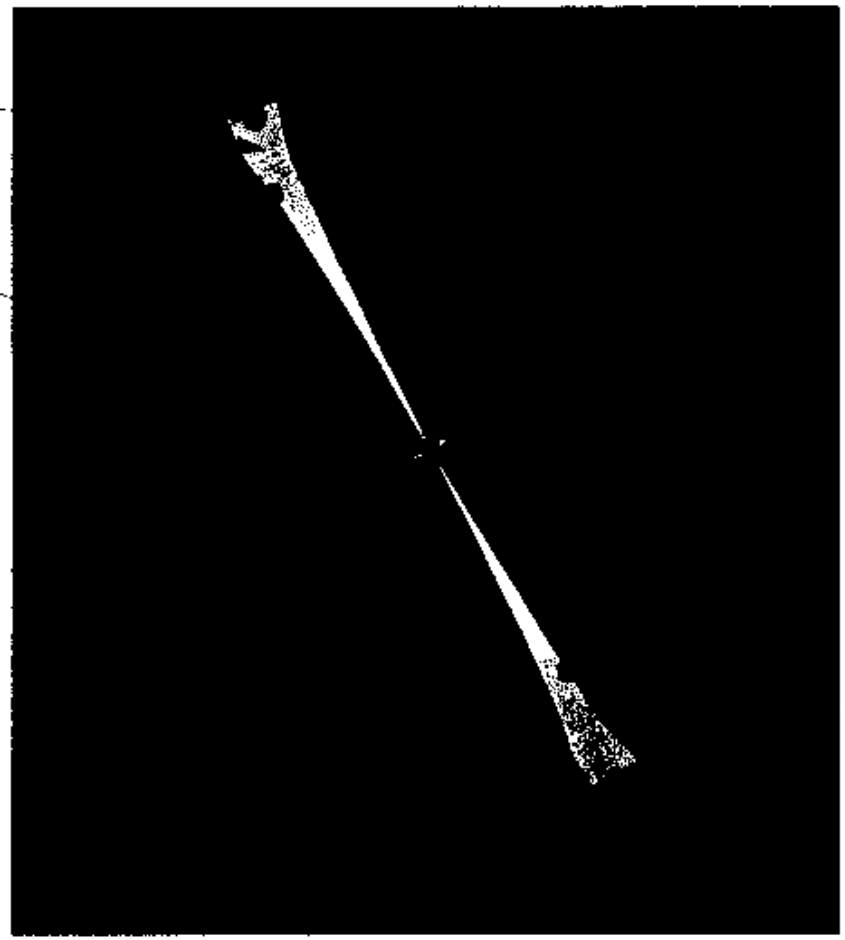
μe v. re



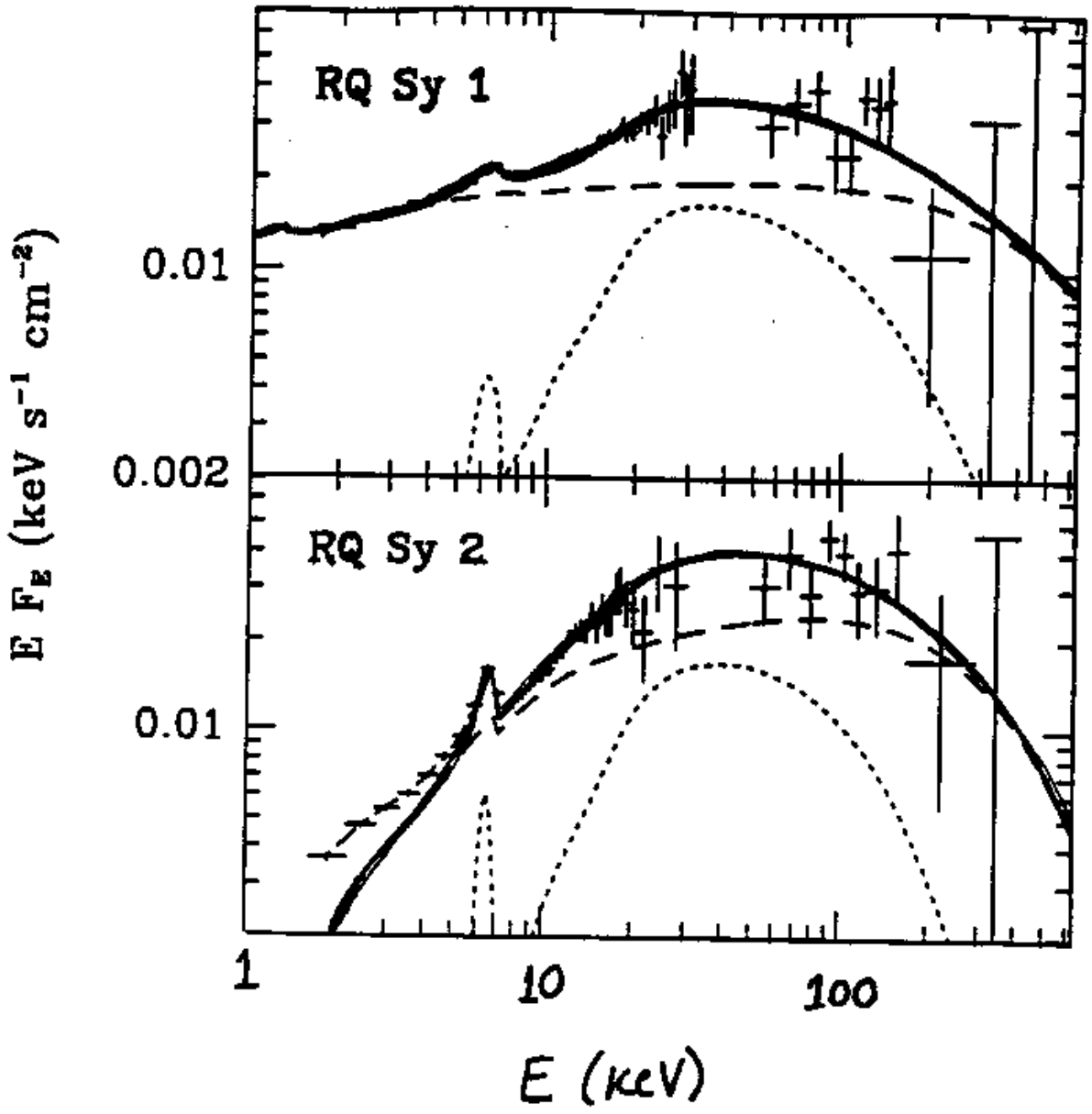
cmu, scarpa, o'dowd

AGN Unification

(Diagram from Urry & Padovani 1995)



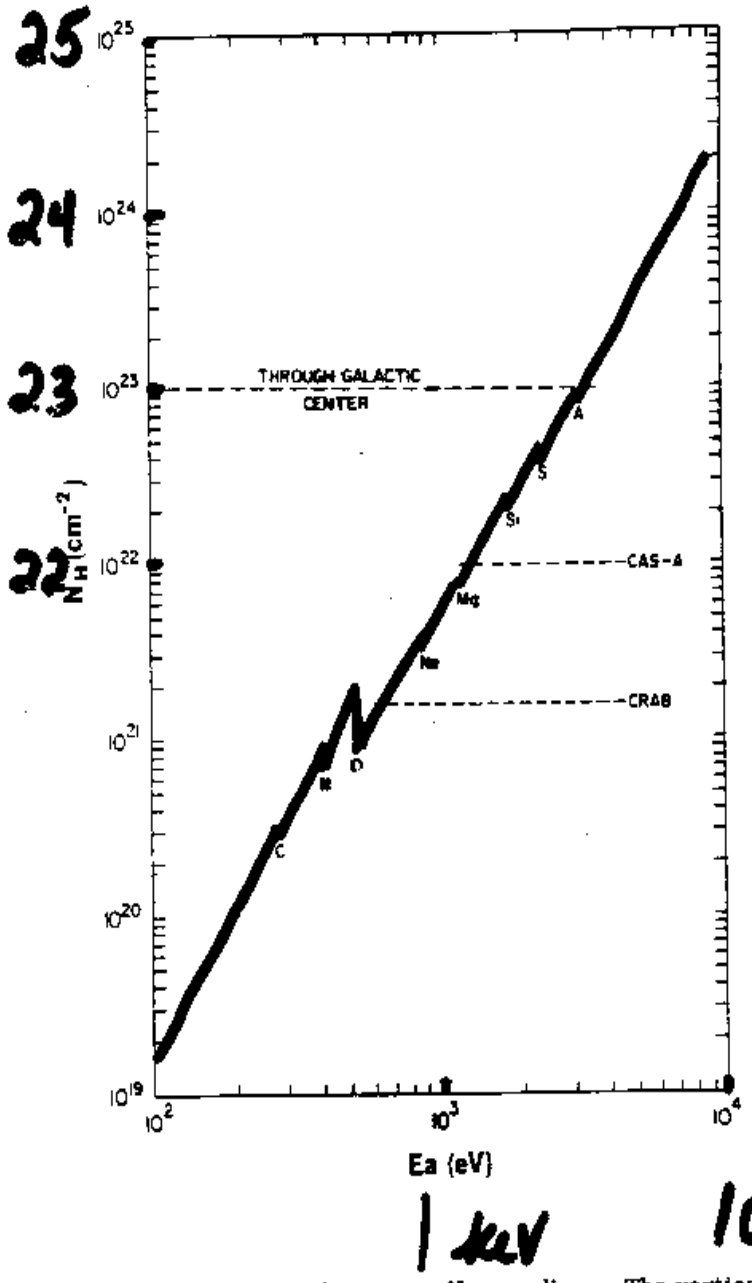
Ginga/OSSE



Zdziarski et al. 1994

Johnson et al., poster

XTE, Integral (Gehrels)



Photoelectric absorption in the interstellar medium. The vertical axis gives the column density in units of hydrogen atoms/cm^2 at which the absorption is 1/e at the photon energy E_a. (For a hydrogen atom number density of $1/cm^3$, 1 Kpc is equivalent to a column density of 3.1×10^{21} hydrogen atoms/cm^2.)

OBSCURED AGN

① BLACK HOLE DEMOGRAPHICS: N(m, z)

"missing" (obscured) AGN?

observe at "quasar epoch" $z \sim 2\text{-}3$

- ratio of OBSCURED : UNOBSCURED
  type 2 : type 1

Gilli et al. 2001	10 : 1*	X-ray constraints
Comastri et al 1994, Norman et al. 2001	4 : 1	"
Rush et al. 1993	3 : 1	12 μm sample
Huchra and Burg 1992	2 : 1	CfA sample
Lawrence et al 1987, Halpern et al 1999	0 : 1	(few found at high z)

* implies evolution faster for type 2

OBSCURED AGN

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OBSCURED AGN

② X-ray "BG", IR "BG"

X-rays: ~80% resolved (CDFs)

IR: SCUBA resolved ~80% COBE FIRAS

- accretion vs. nucleosynthesis
- BH - galaxy connection

redshifts of interest:

$z \sim 0-1.5$	X-rays
$z \gtrsim 2$	IR

$\frac{L}{L_{Edd}}$, $\dot{M}$, η

- measure $\sigma_s \rightarrow M_{BH} \rightarrow L_{Edd}$

  MUCH easier in obscured AGN!

- "observe" bolometric $L \rightarrow L/L_{Edd}$

- $L = \eta \dot{M} c^2$

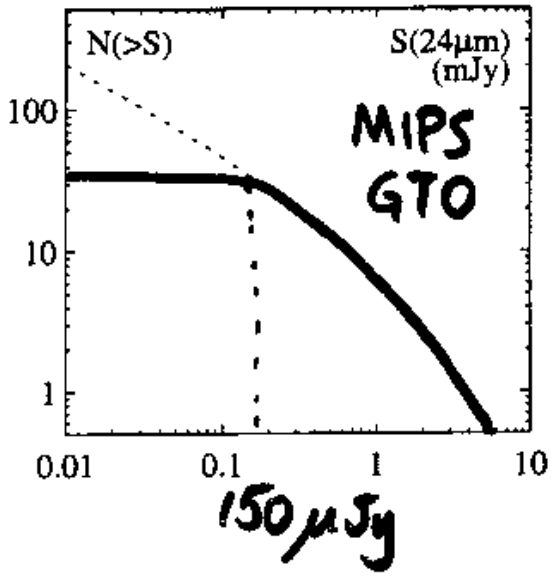
  estimate minimum $\dot{M}$ (Bondi accretion)

  $\rightarrow \eta < \frac{L}{\dot{M}_{Bondi} c^2} \sim 10^{-5}$ di Matteo et al 2001 NGC 6166

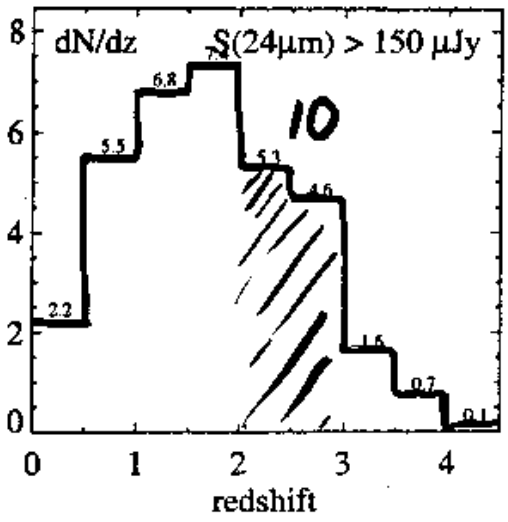
  supports ADAF/ADIOS models

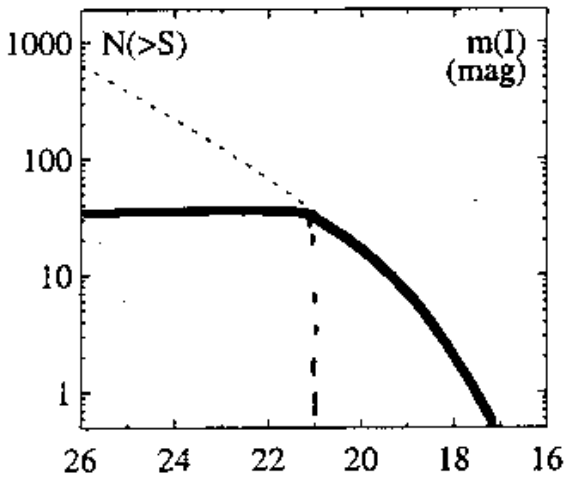
type 1 AGN

logN-logS

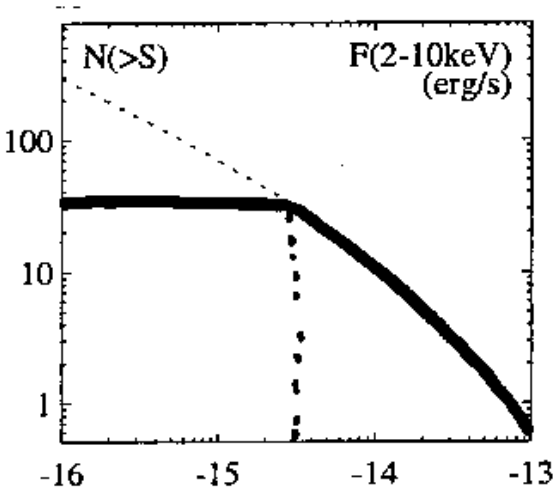


150 μJy





I = 21



$F_x \sim 3E\text{-}15$

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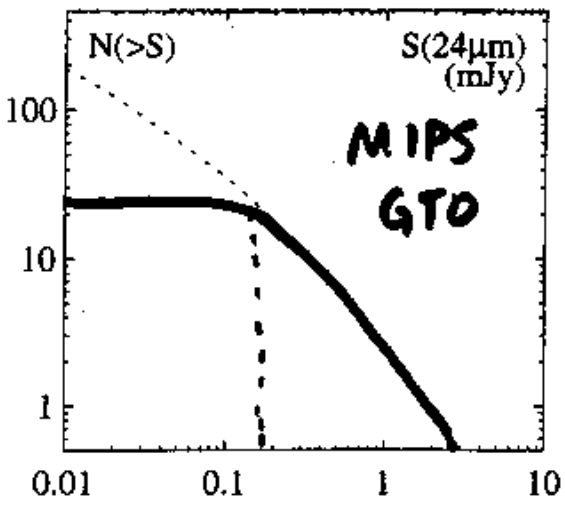
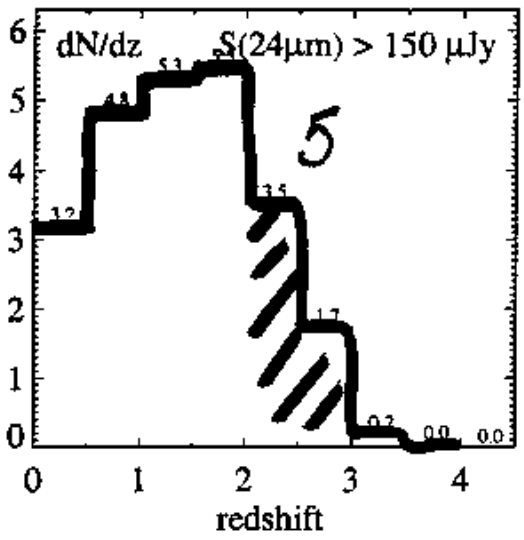
Type 2 AGN log N-log S

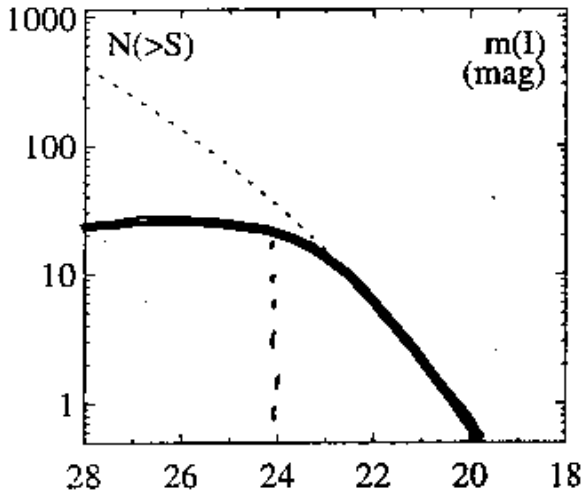


MIPS GTO

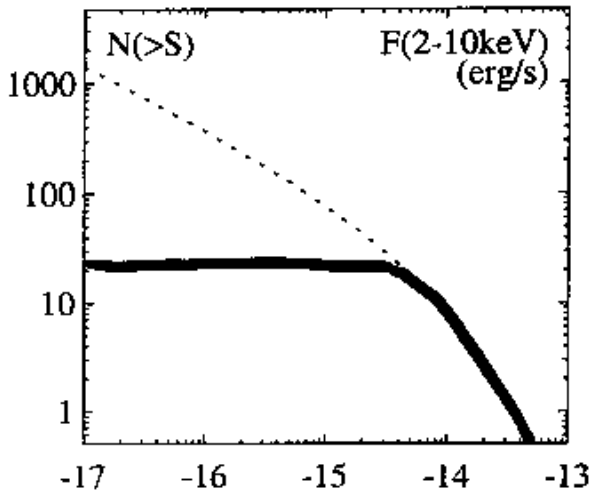
150μJy



5



I ~ 24



$F_x \sim 4E\text{-}15$

Anton Koekemoer