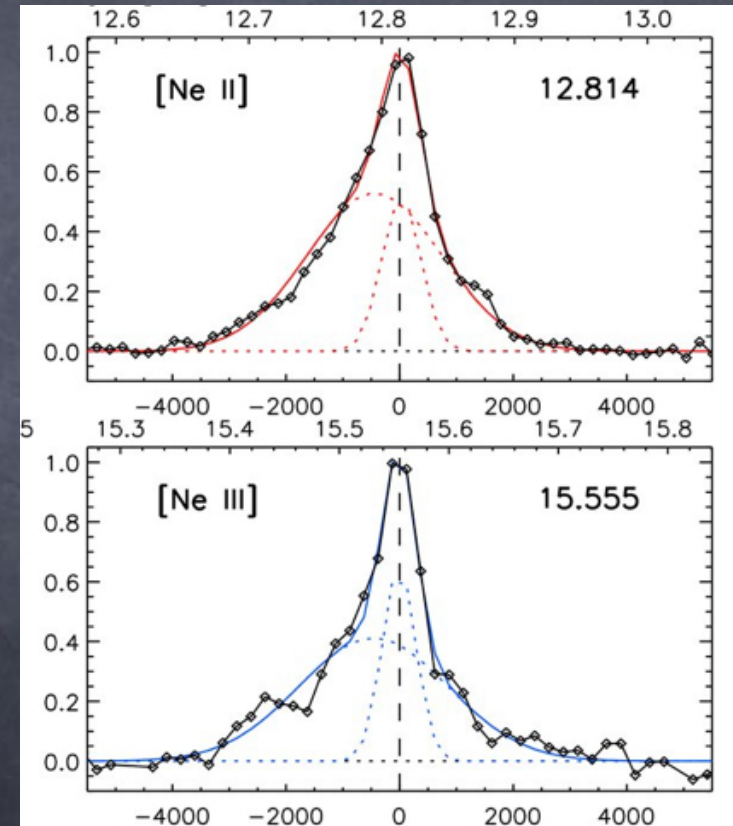
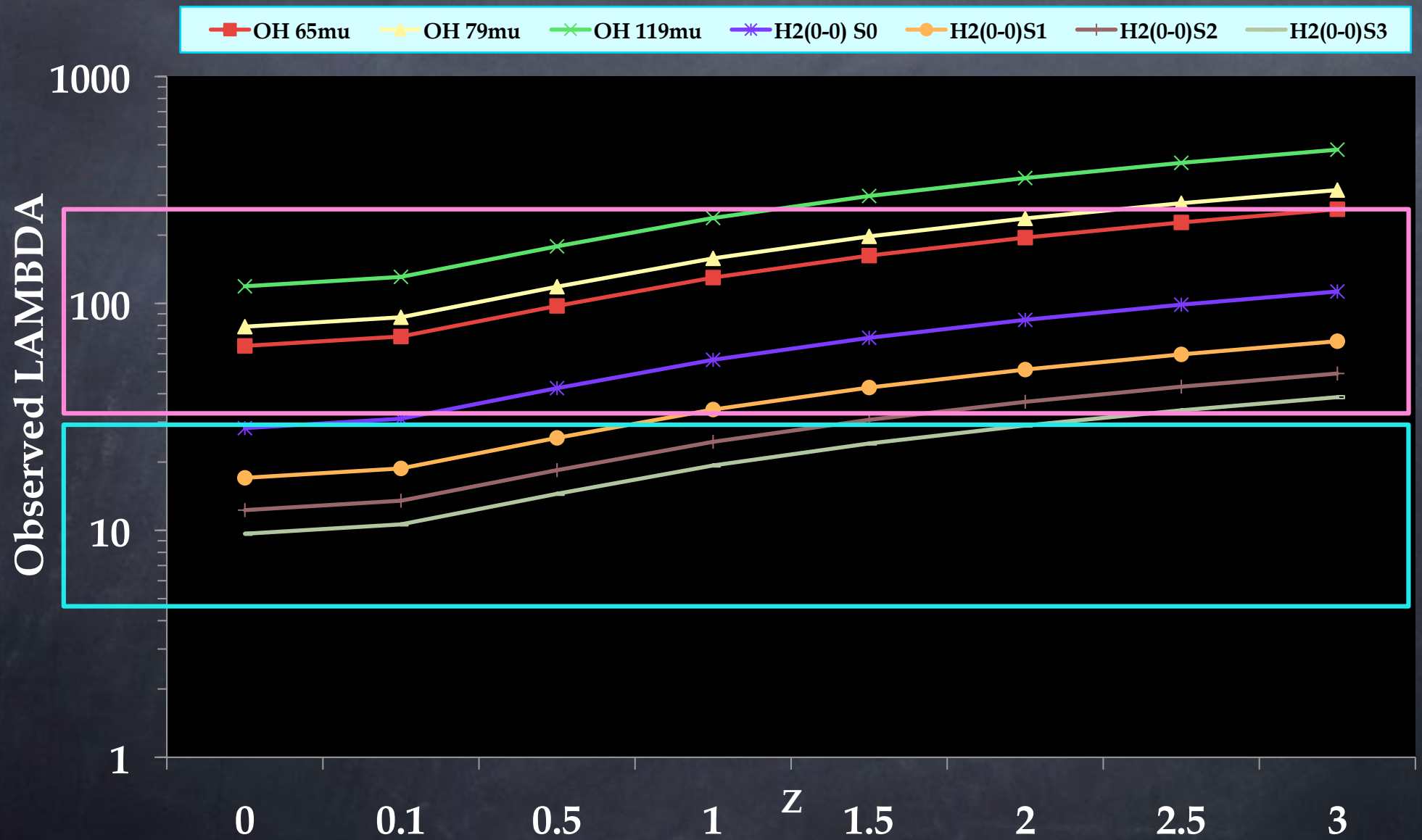


Outflows in ionized gas

IRAS F00183-7111 with $R \sim 600$
Spoon et al.09

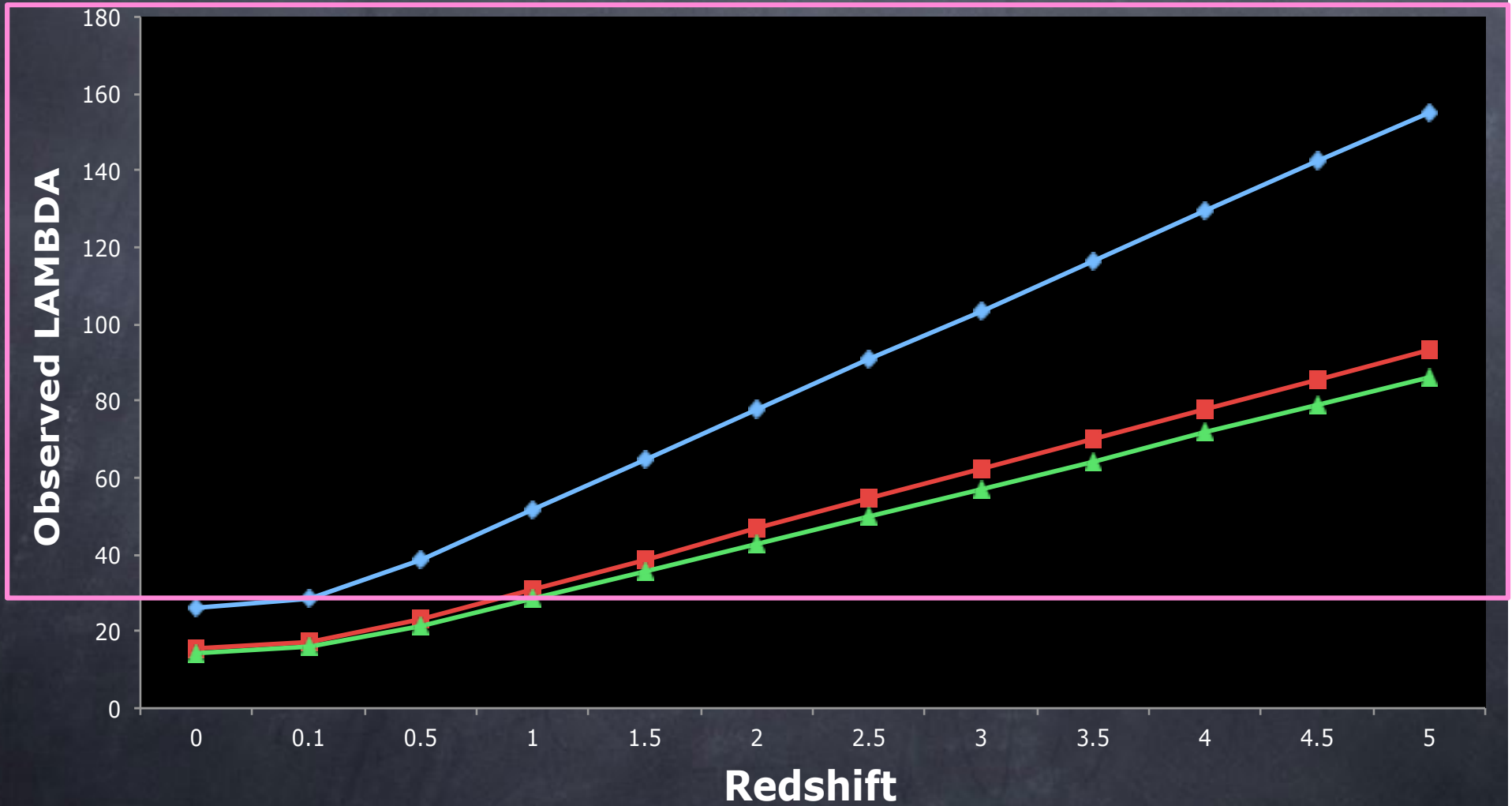


Molecular Lines



Ionized Gas

◆ [O IV] 25.89 μ ■ [Ne III] 15.56 μ ▲ [NeV] 14.32 μ



Absorption line spectroscopy

Absorption troughs = 5-10%

Abs. Width = 500-1000km/s $R=600-300$

Continuum at $10-20\sigma$ on

$\Delta\lambda\sim 0.5-0.25\mu\text{m}$

PACS continuum sensitivity:

100mJy 1hr 5σ

Safari $<10\text{mJy}$ 1hr 5σ

$L(\text{Mark231})\sim 10^{46}$ ergs/s

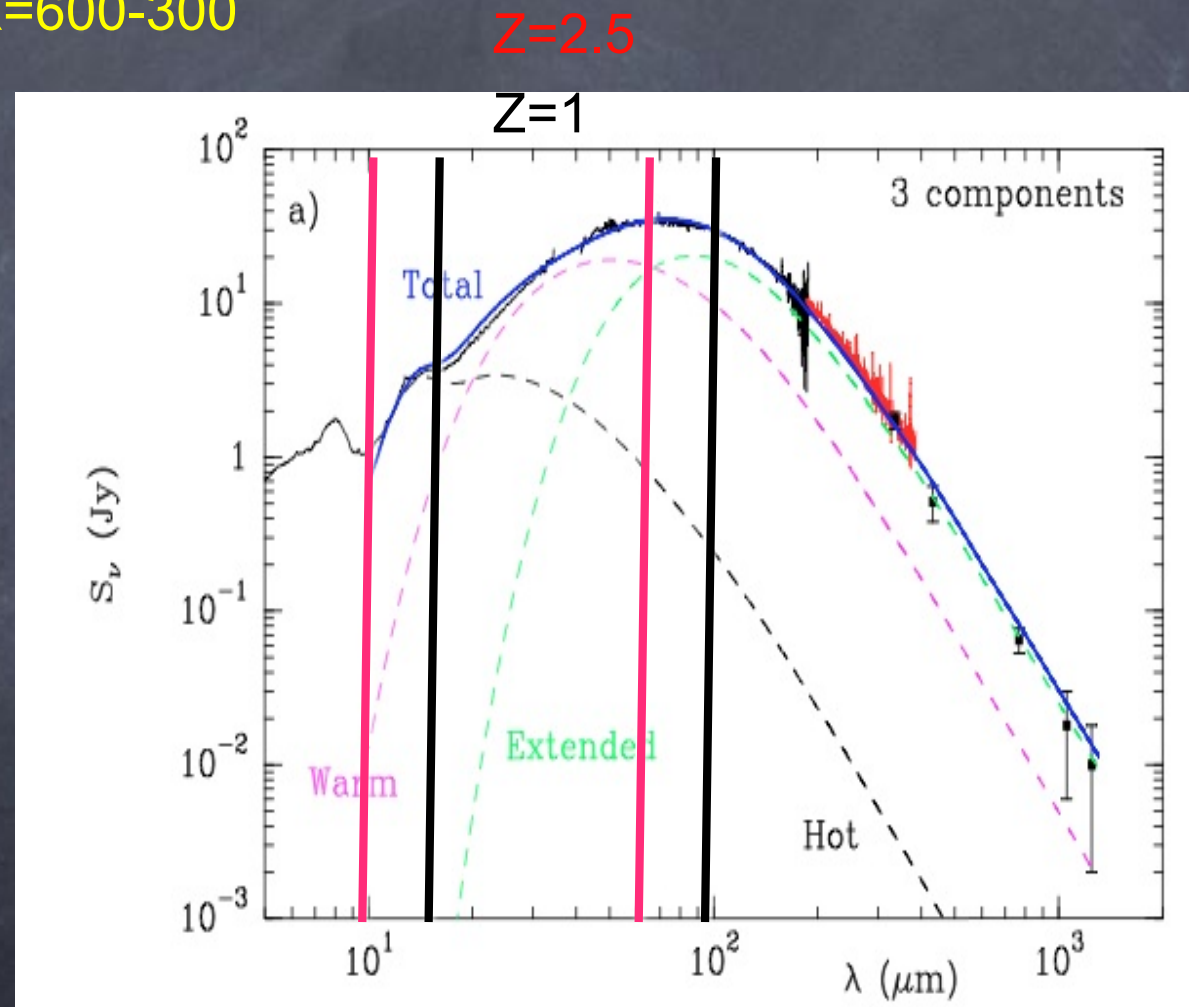
$F(\text{Mark231})\sim 10-30$ Jy

$F(z=1)/F(z=0.042)=10^{-3}$

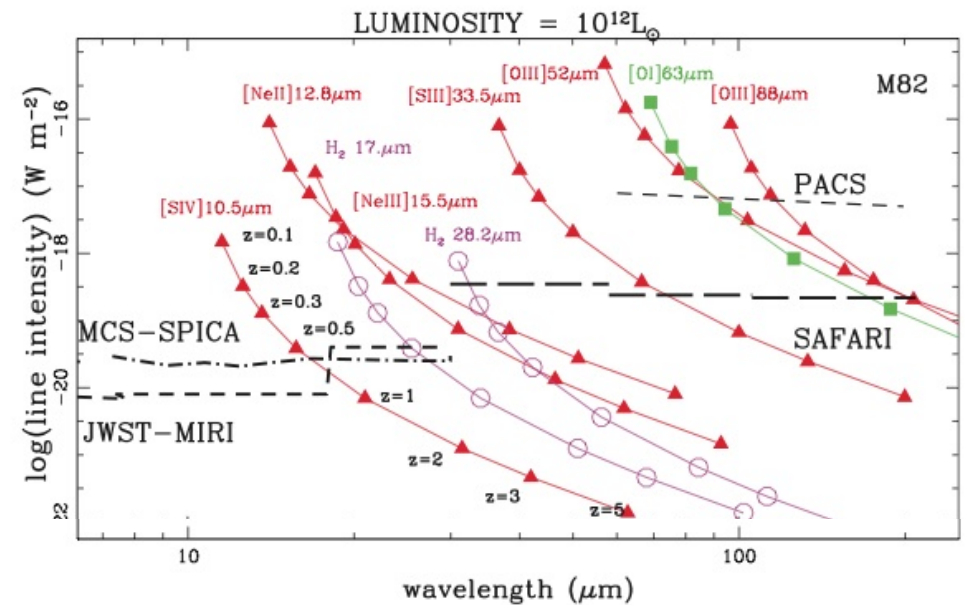
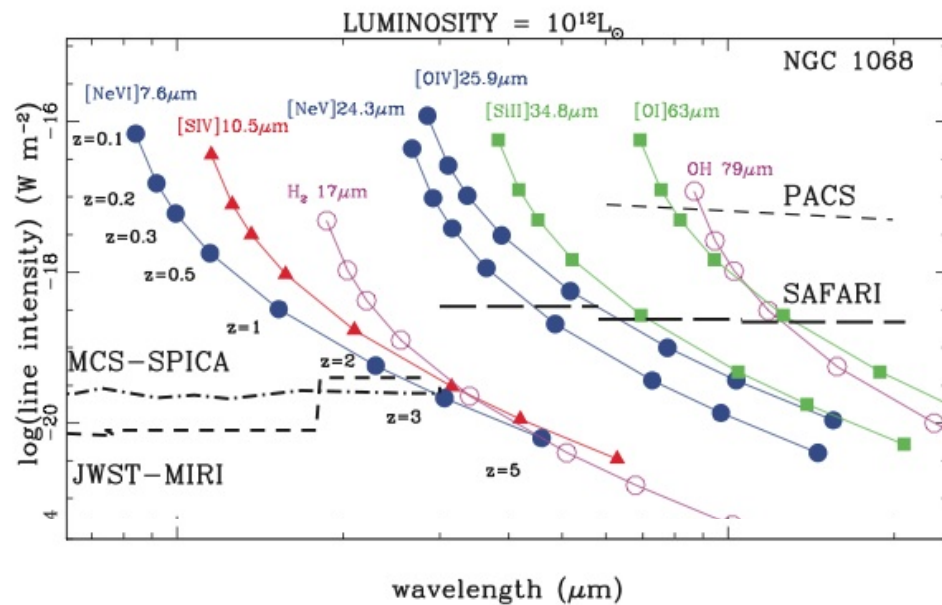
$F(z=2.5)/F(z=0.042)=10^{-4}$

$F(\text{Mark231 } z=1)=3-30\text{mJy}$

$F(\text{Mark231 } z=2.5)=1-30\text{mJy}$



Emission line spectroscopy



Spinoglio + 2012

Mapping of local galaxies

M82 Blue=X-rays,Red=MIR

14 pc/arcsec

NGC1068 Blu=X-ray, red=optical

77pc/arcsec

