

Diagnostic spectroscopy of lensed galaxies

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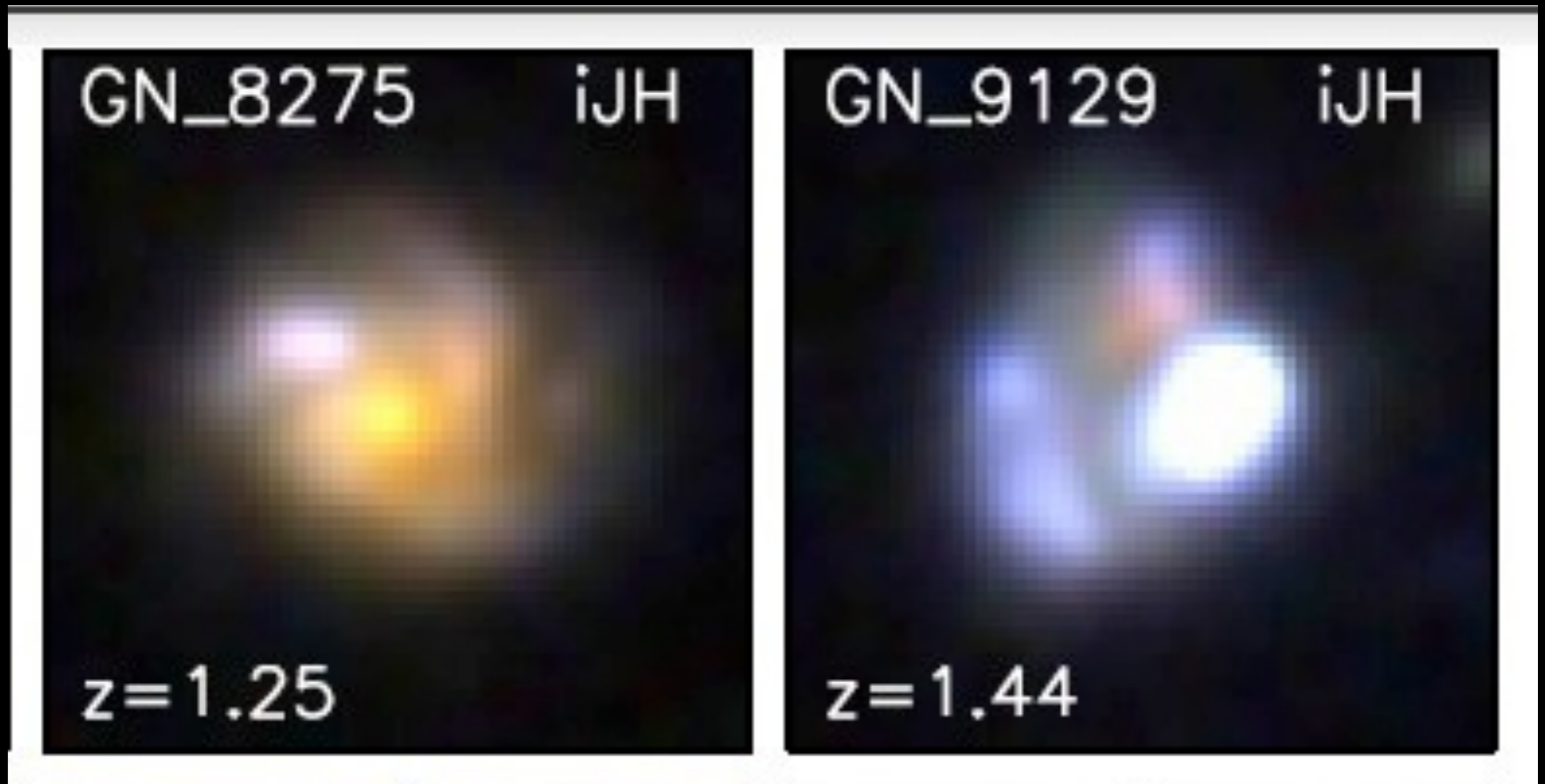
with

Michael Gladders, Keren Sharon, Eva Wuyts, **Matt Bayliss,**
Kate Whitaker



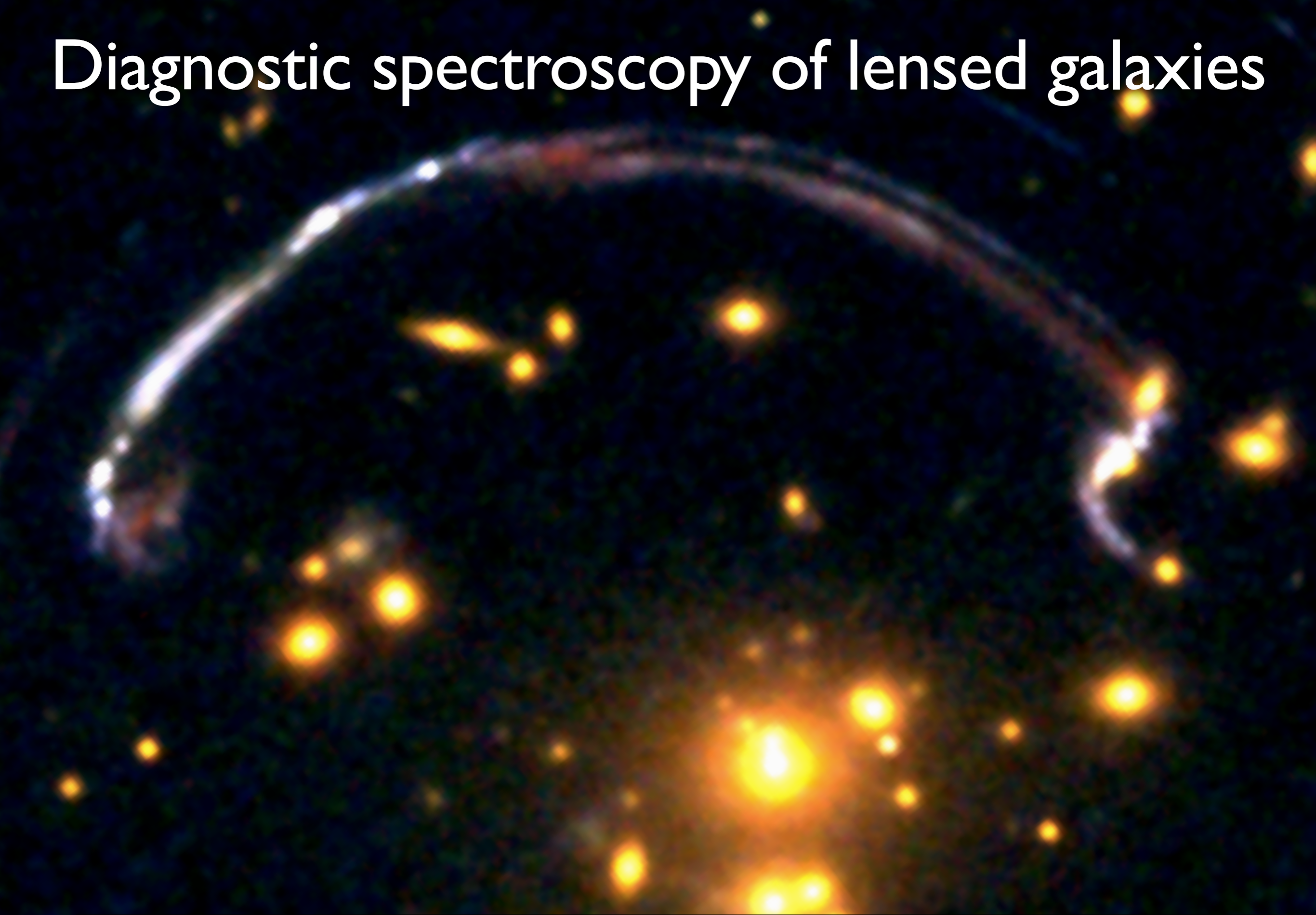
WFC3 Hubble Ultradeep Field (NASA and UCSC)

Redshift 1–3 galaxies as seen by HST.



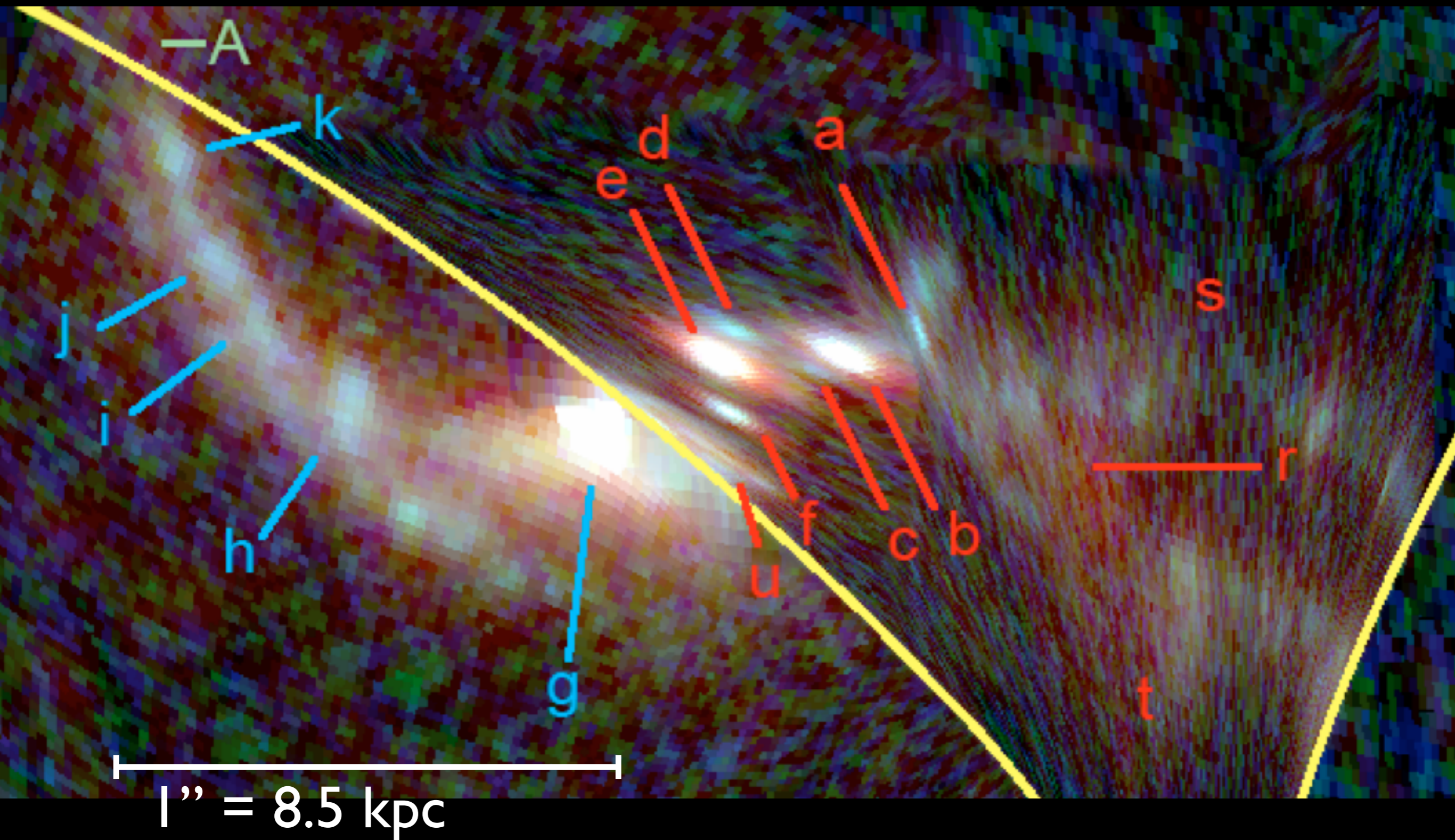
S. Wuyts et al. 2013, CANDELS + 3D-HST

Diagnostic spectroscopy of lensed galaxies



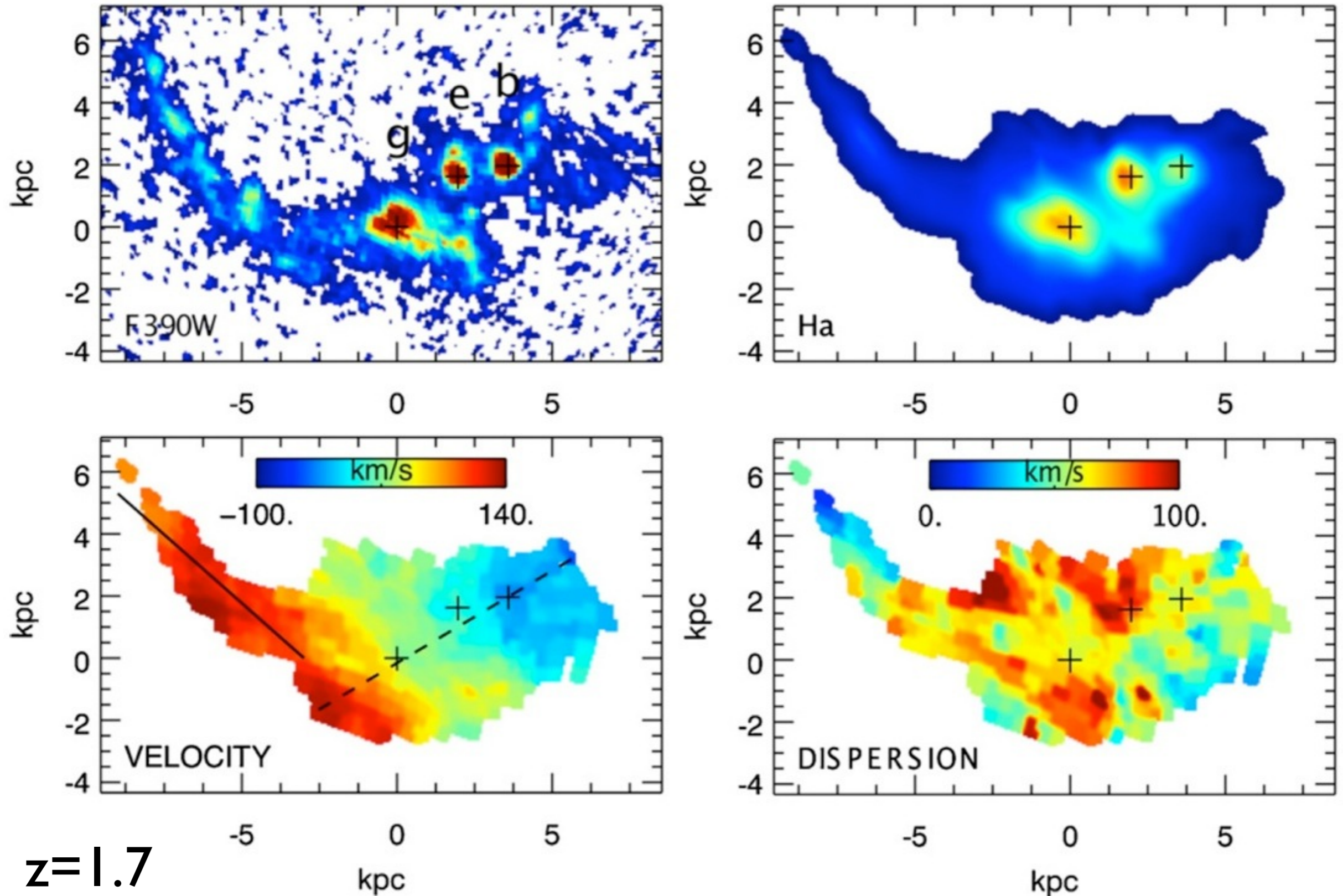
$z=1.7$, Sharon, Gladders, Rigby, Wuyts et al. 2012

Diagnostic spectroscopy of lensed galaxies



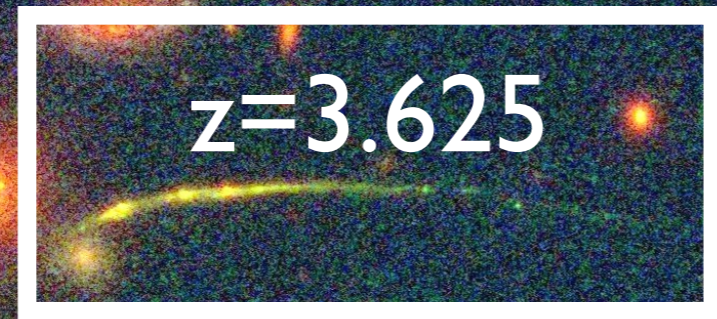
$z=1.7$, Sharon, Gladders, Rigby, Wuyts et al. 2012

Highly spatially resolved IFU spectra, $z=1.7$



Wuyts, Rigby, Gladders, & Sharon 2014; Rigby et al. 2011

$z=1.182$



$z=3.625$

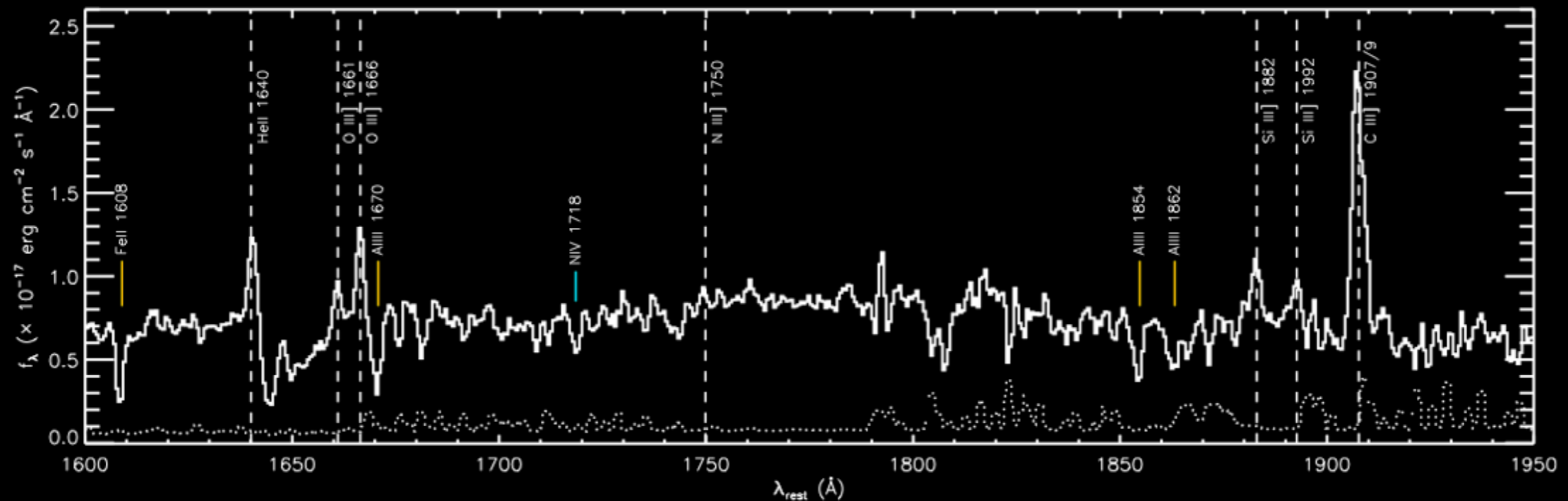
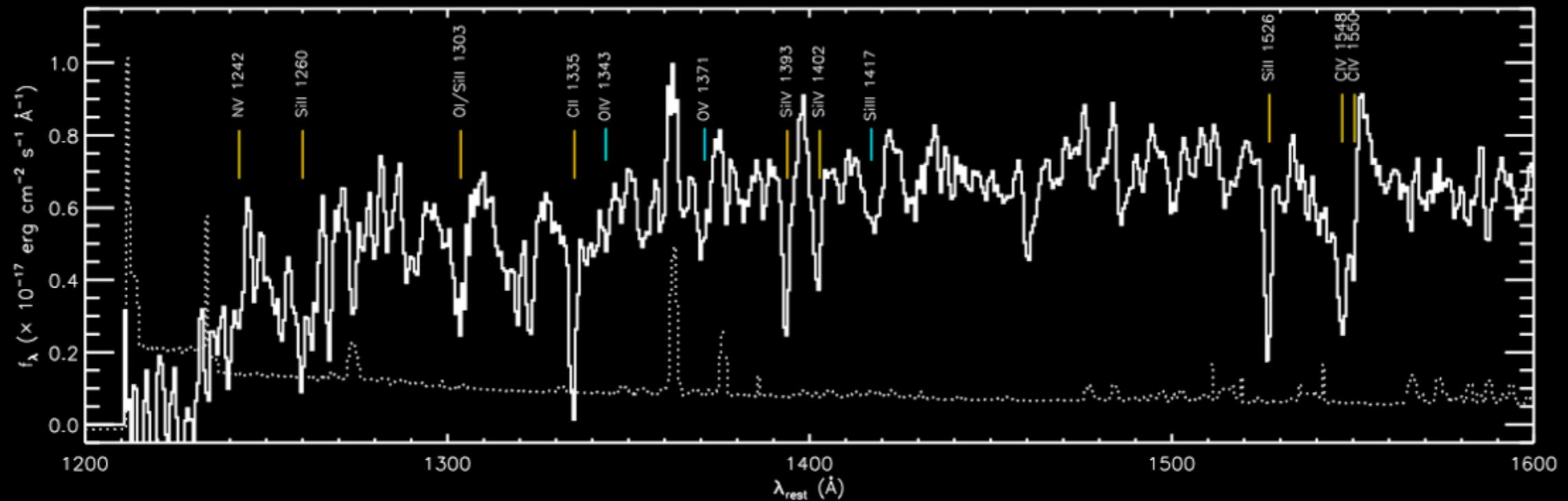
$z=4.87$

$z=1.134$

$z=2.404$

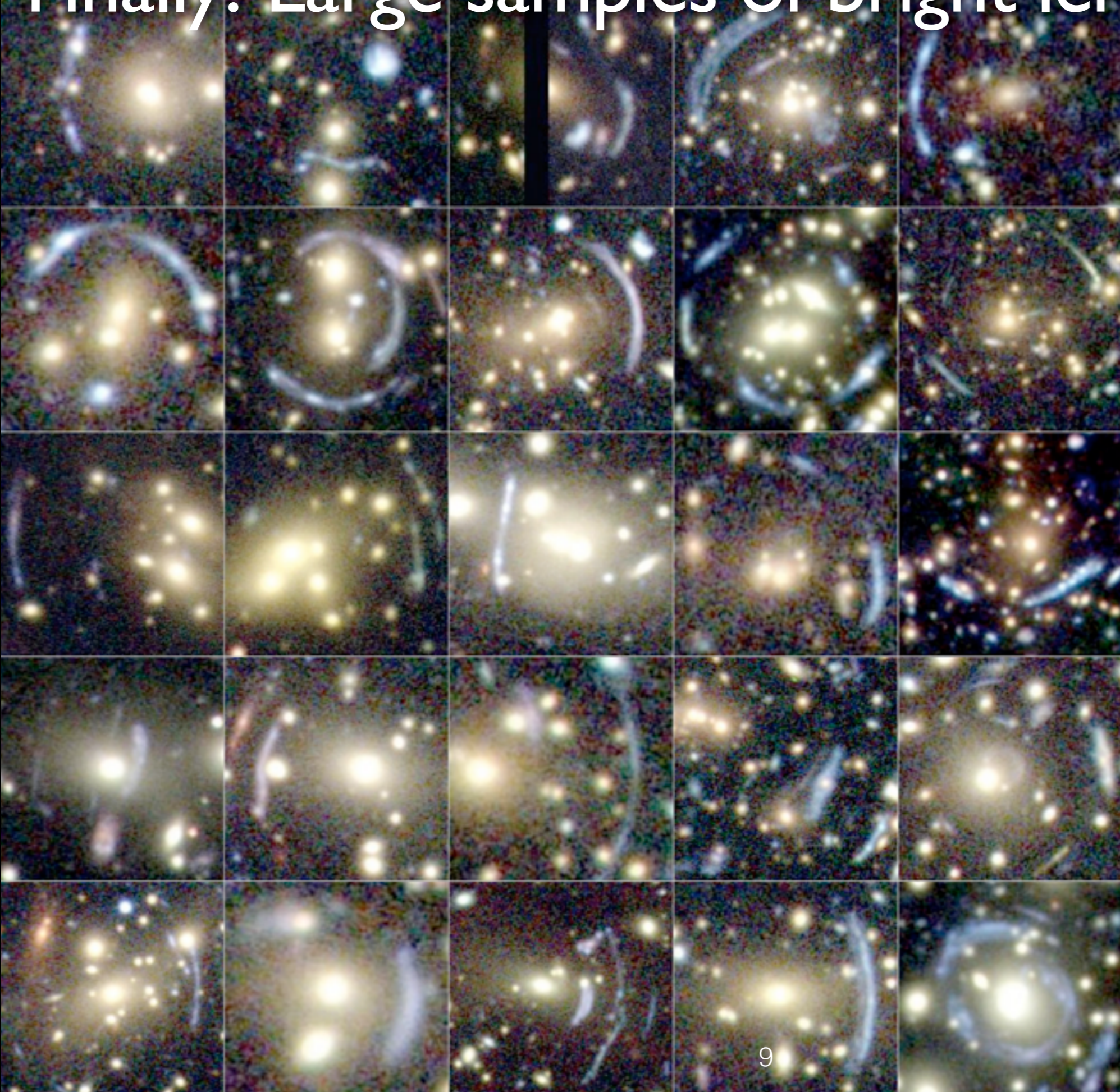
SGAS 1050

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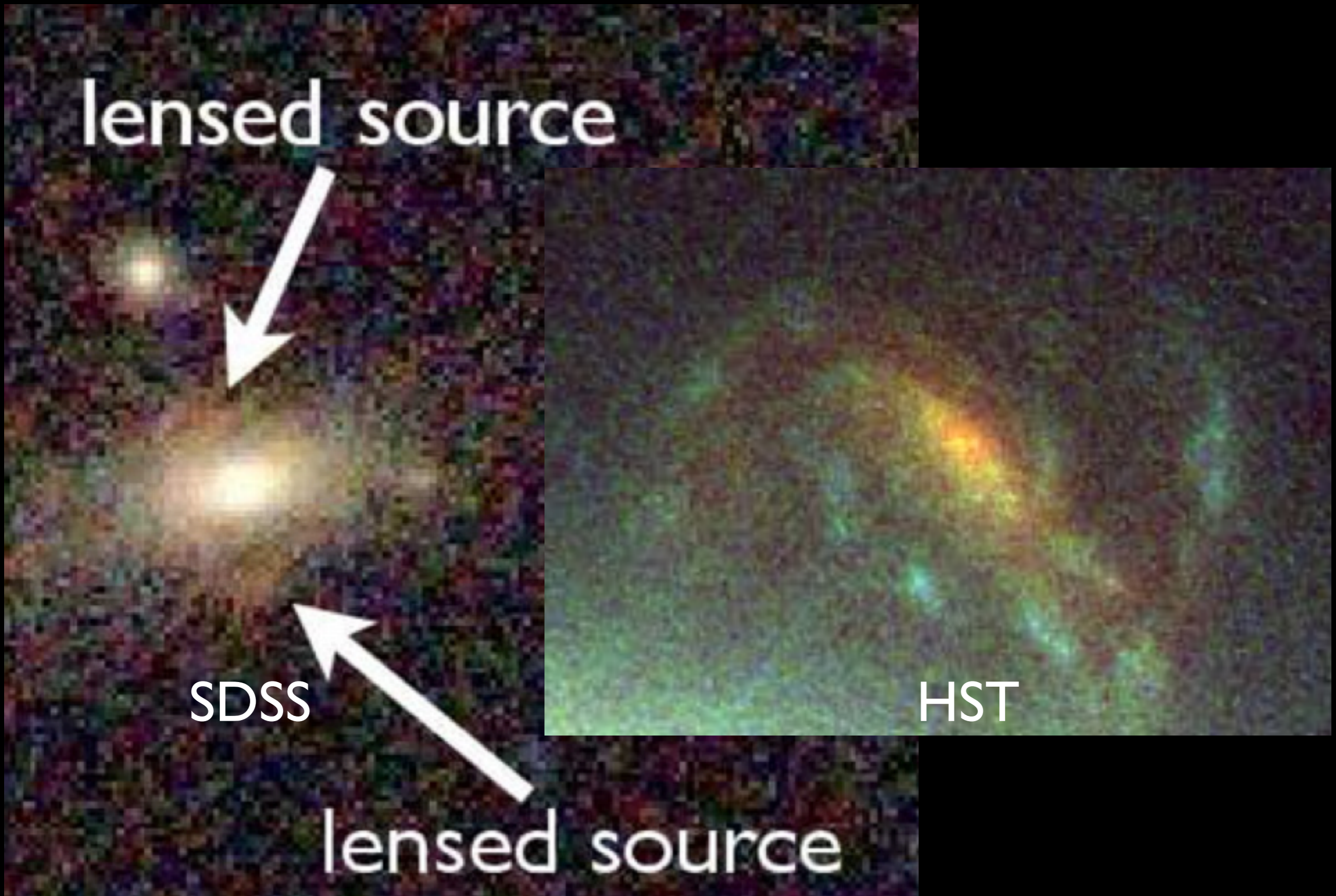
2 hrs on Gemini, $z=3.62$, Bayliss, Rigby, et al. (2014)

Finally! Large samples of bright lensed galaxies

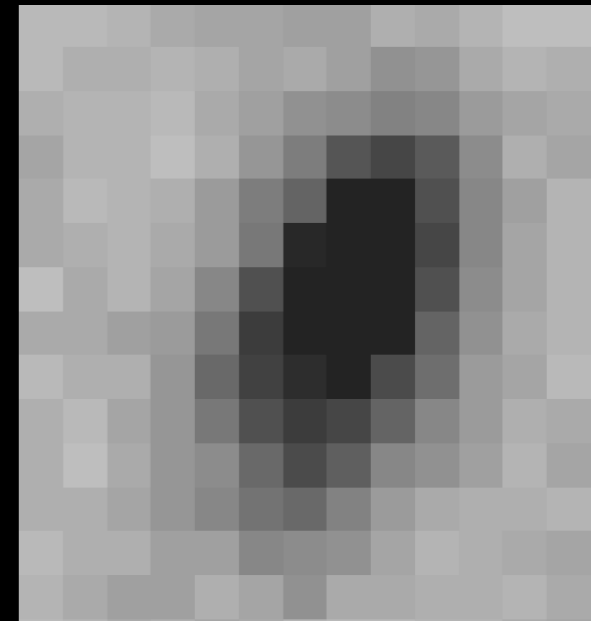


Strongly lensed
galaxies from SDSS
Giant Arcs Survey
(Hennawi+ 2008;
Bayliss+ 2011 a,b;
Gladders+ in prep.)

SDSS discovers, HST follows.
WFIRST does both.



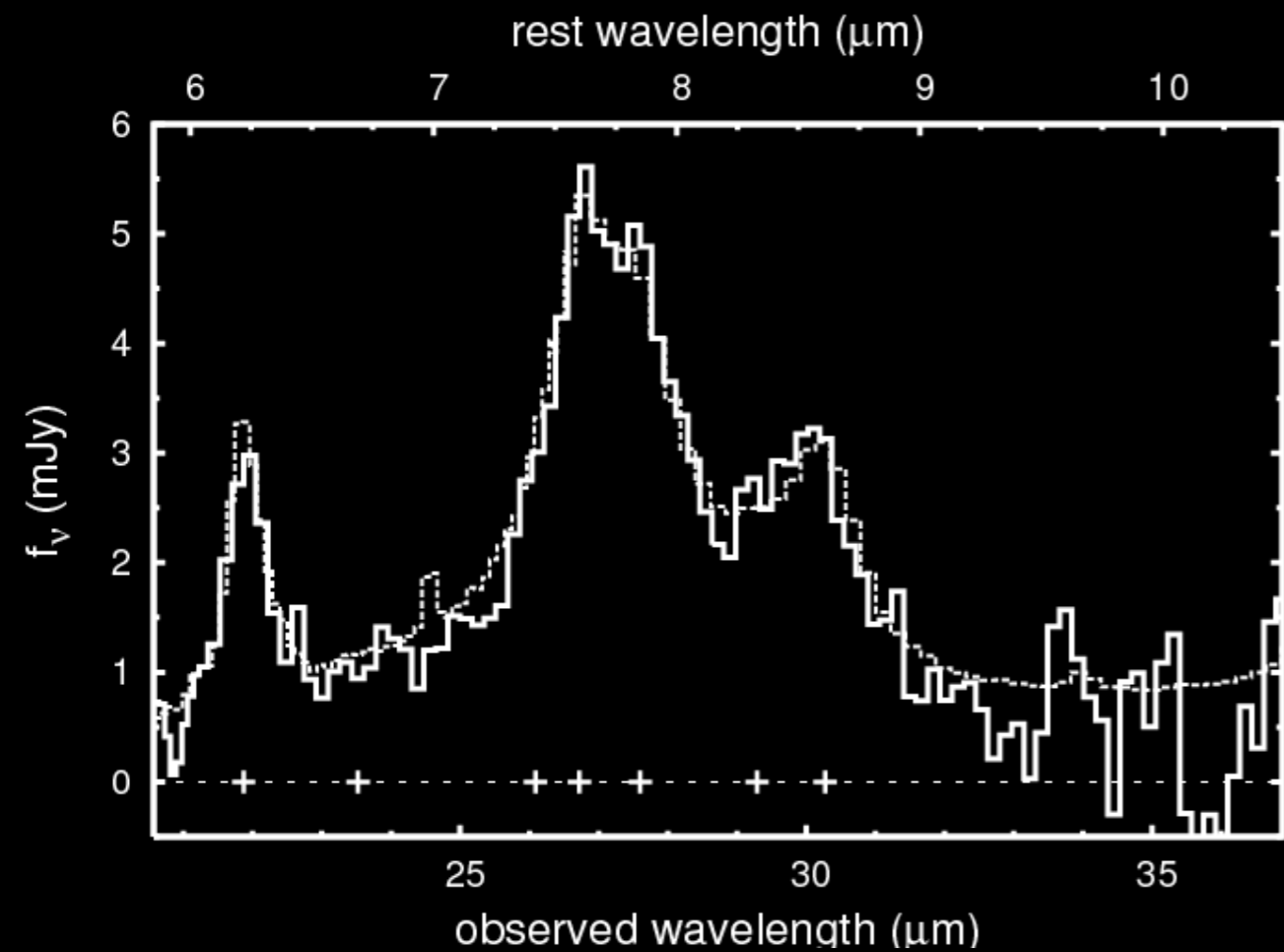
Zoom in on star-forming regions.



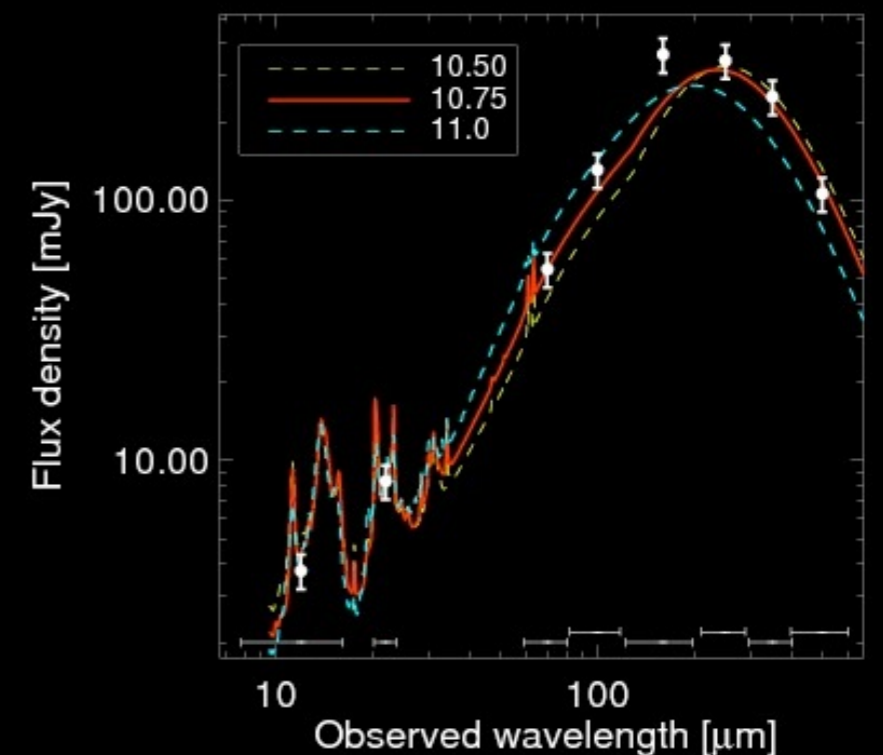
F606W + F390W HST

$z=2.481$, first reported in ¹Stark et al. 2013

Mid-IR spectra for average galaxies

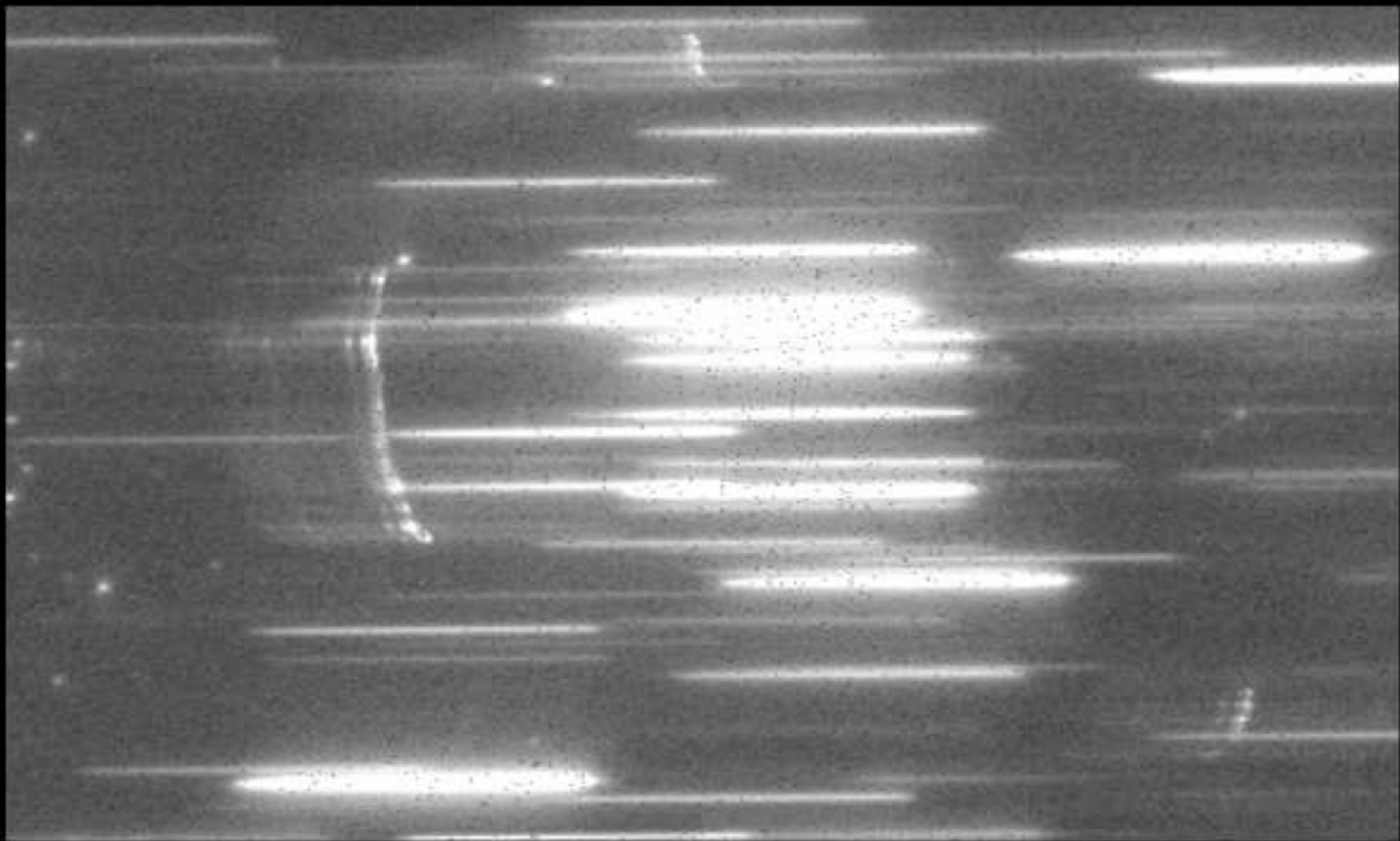


The best rest-frame mid-IR spectrum of a distant galaxy, at $z=2.516$ behind Abell 2218. From Rigby et al. (2008).



A dead-average $z=0.8$ star-forming galaxy, lensed to 0.4 Jy! from Gladders, Rigby et al. 2013

Grism spectra of lensed galaxies



Whitaker, Rigby, Brammer, Gladders et al. 2014

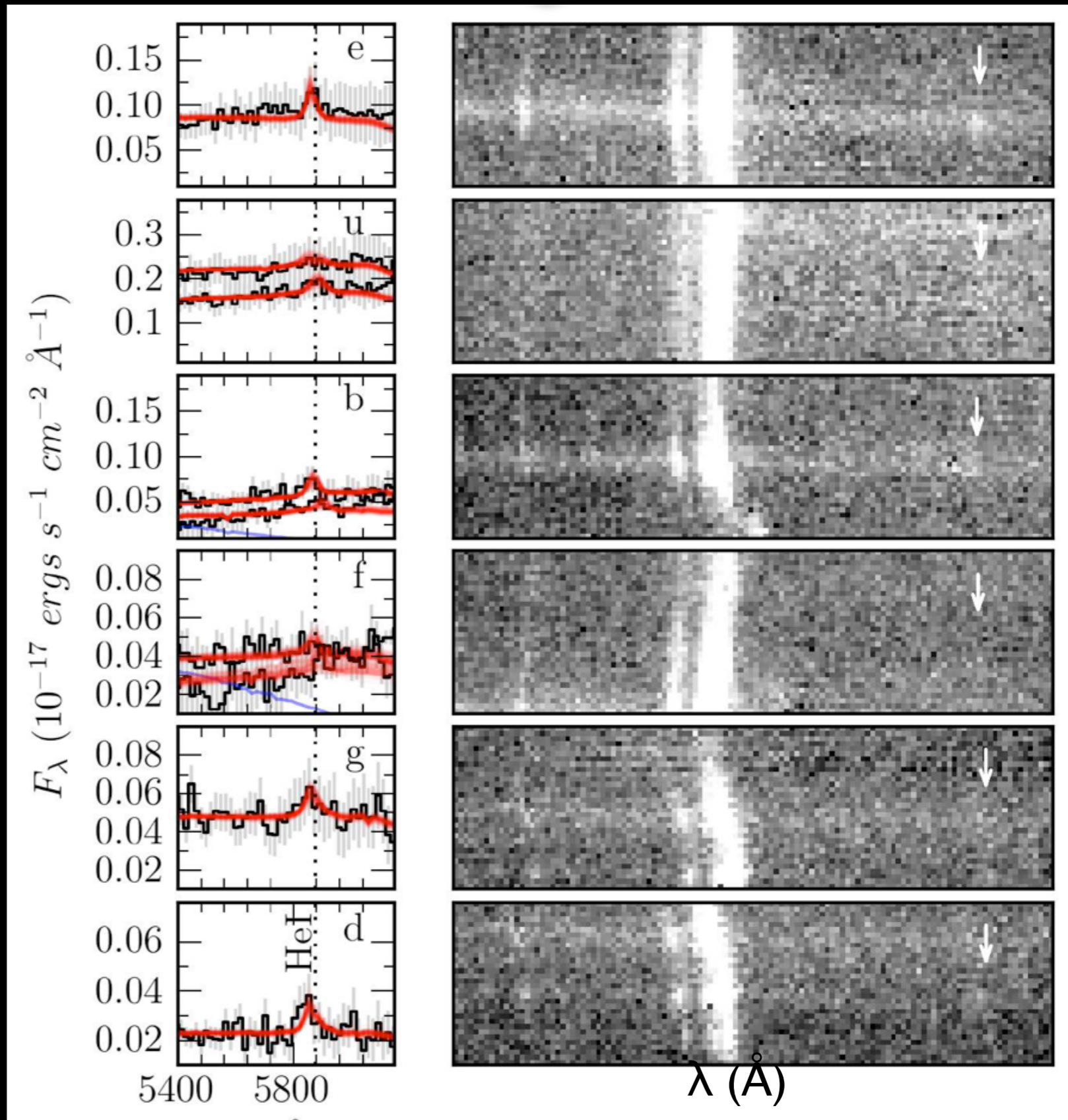
Grism spectra of lensed galaxies



Whitaker, Rigby, Brammer, Gladders et al. 2014

Grism spectra of lensed galaxies

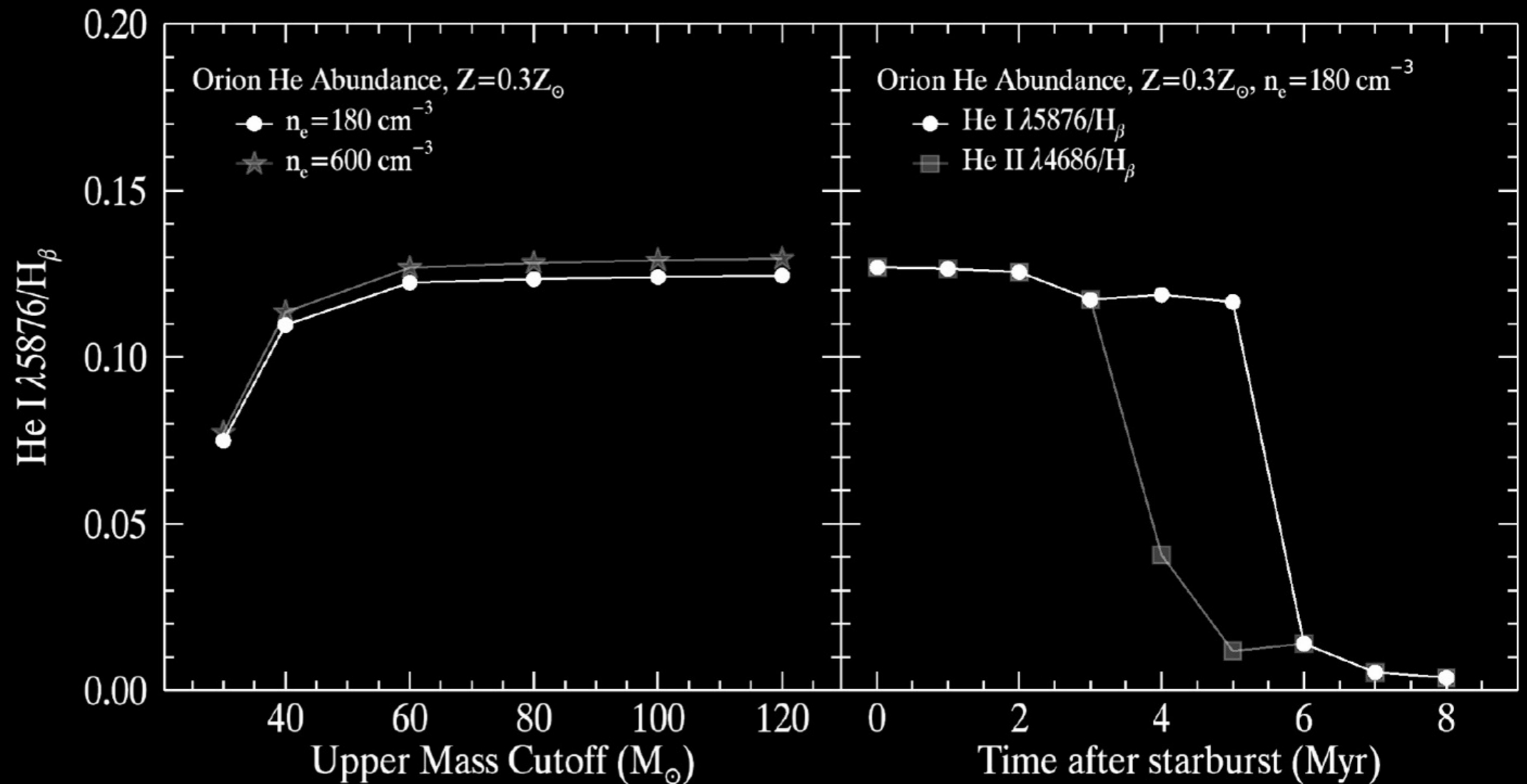
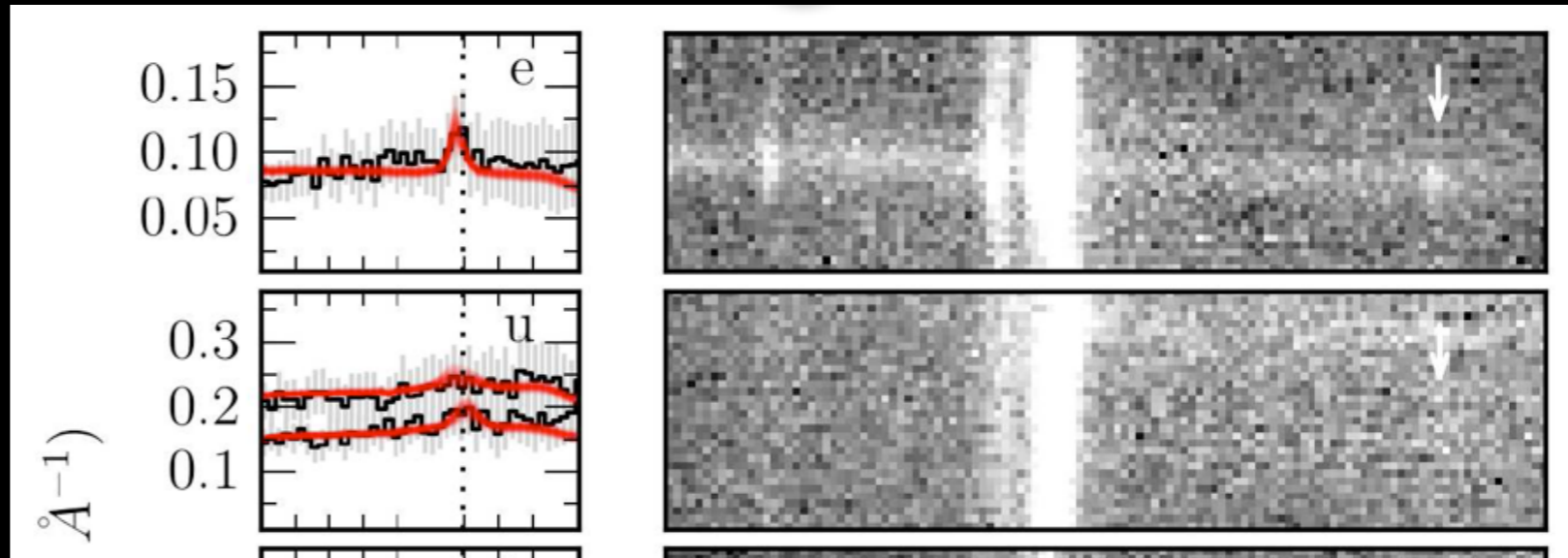
Stellar mass function,
via He I 5876 / H β



Whitaker, Rigby, Brammer, Gladders et al. 2014

Grism spectra of lensed galaxies

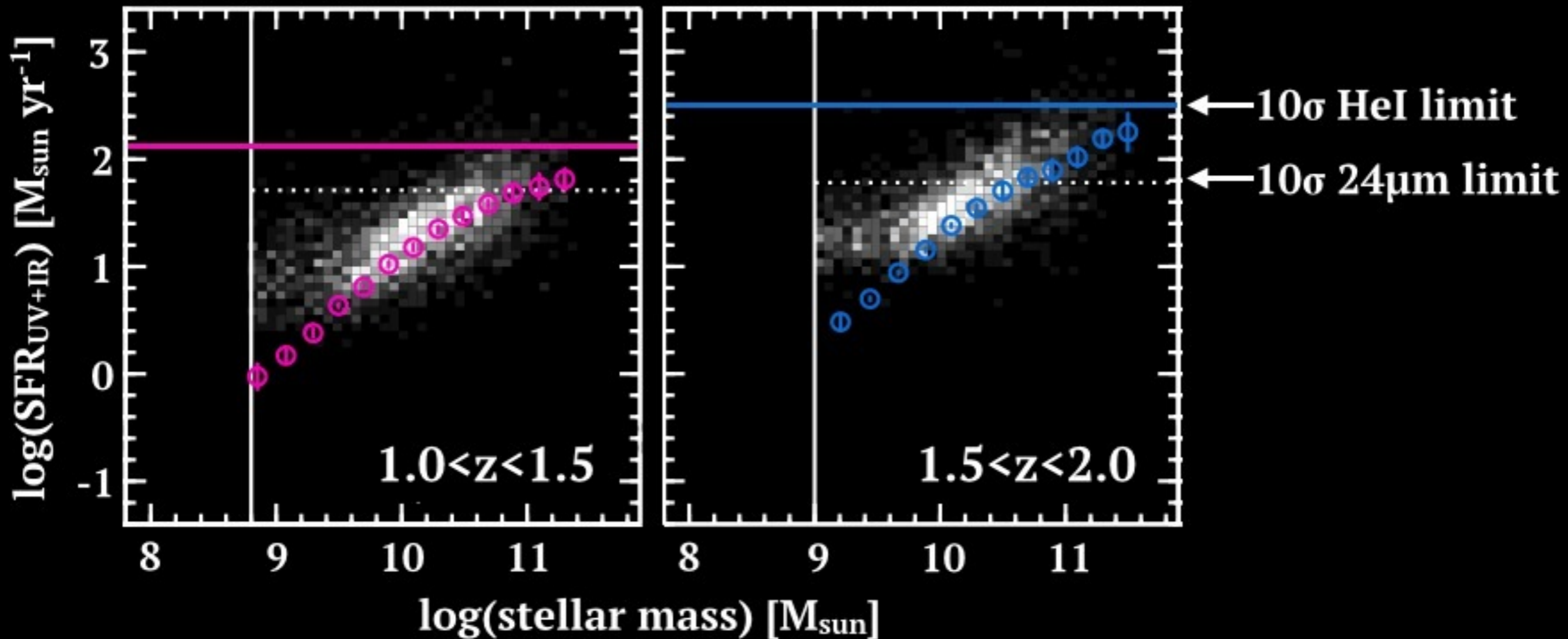
Stellar mass function,
via He I 5876 / H β



Whitaker, Rigby, Brammer, Gladders et al. 2014

Grism spectra of field galaxies

Whitaker et al. (2014b)



$z=1.474$