

STACEY ALBERTS
SPACE TELESCOPE SCIENCE INSTITUTE
ESA/AURA ASTRONOMER
JWST/MIRI INSTRUMENT AND GTO TEAMS



A VERY INCOMPLETE VIEW OF GALAXY EVOLUTION WITH JWST/MIRI

MIRI Mosaic of GOODS-S
F1500W F1000W F560W



MIRI'S VIEW OF THE LOCAL UNIVERSE

($Z \sim 0$)



Phangs

NGC 628

NASA, ESA, CSA, STScI, Janice Lee (STScI), Thomas Williams (Oxford), and the PHANGS team

DUST, EMBEDDED STARS, AND AGN

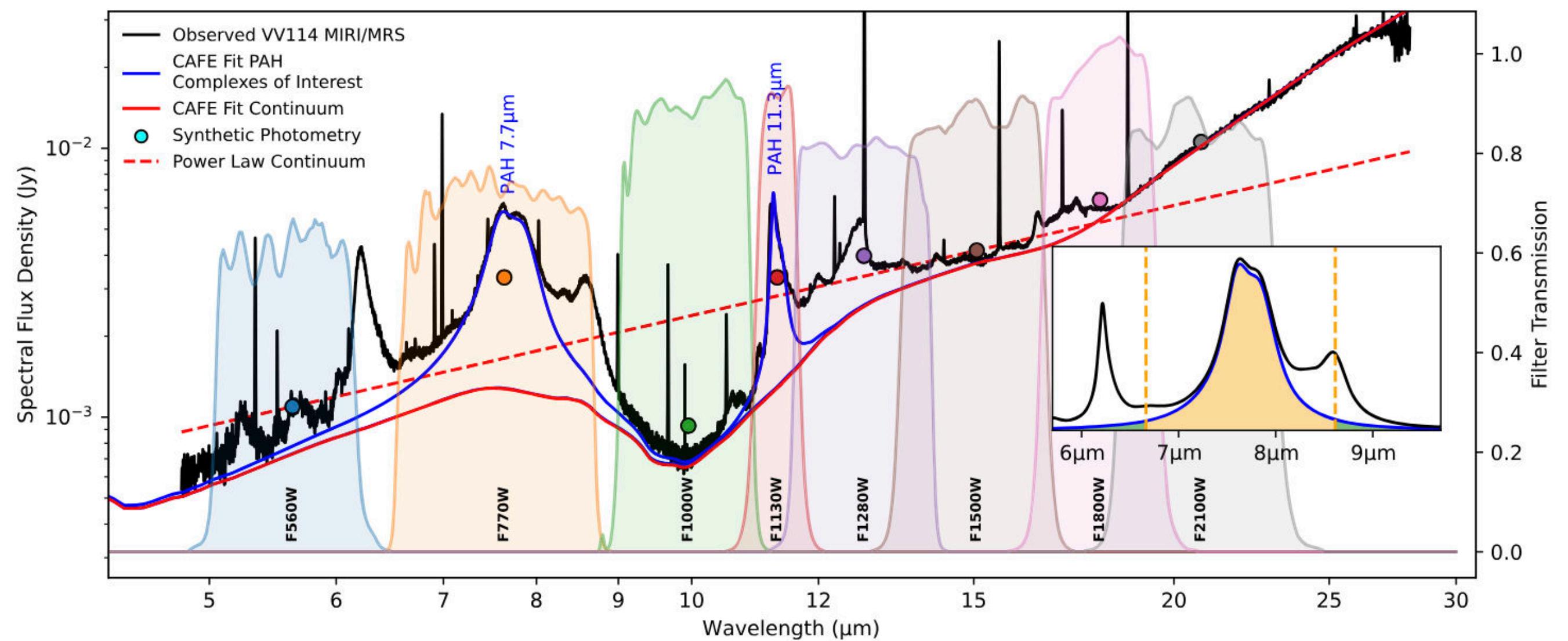
ON PARSEC SCALES

JAMES WEBB SPACE TELESCOPE

NGC 7496



NASA, ESA, CSA, Janice Lee (NSF's NOIRLab); Image Processing: Joseph DePasquale (STScI)



Donnelly et al. 2025



Stacey Alberts

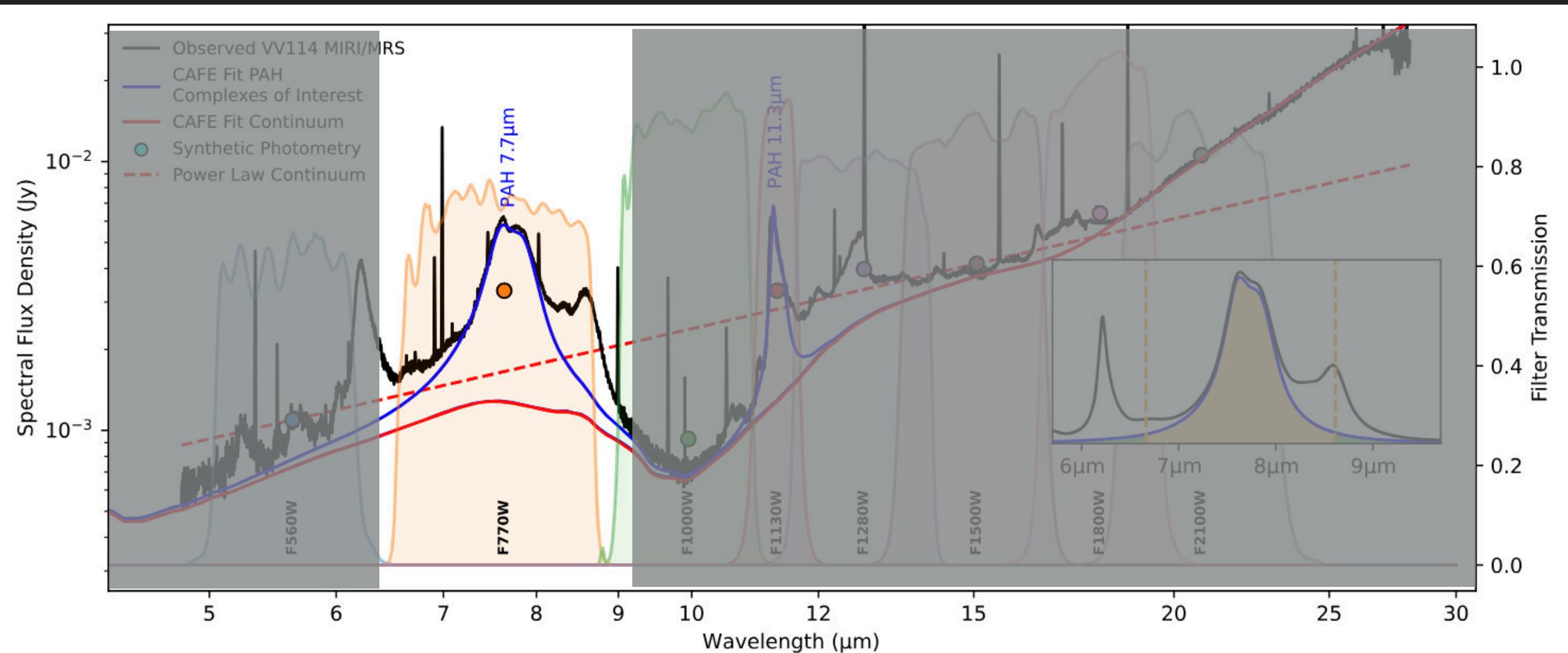
CHRIS

MIRI Filters

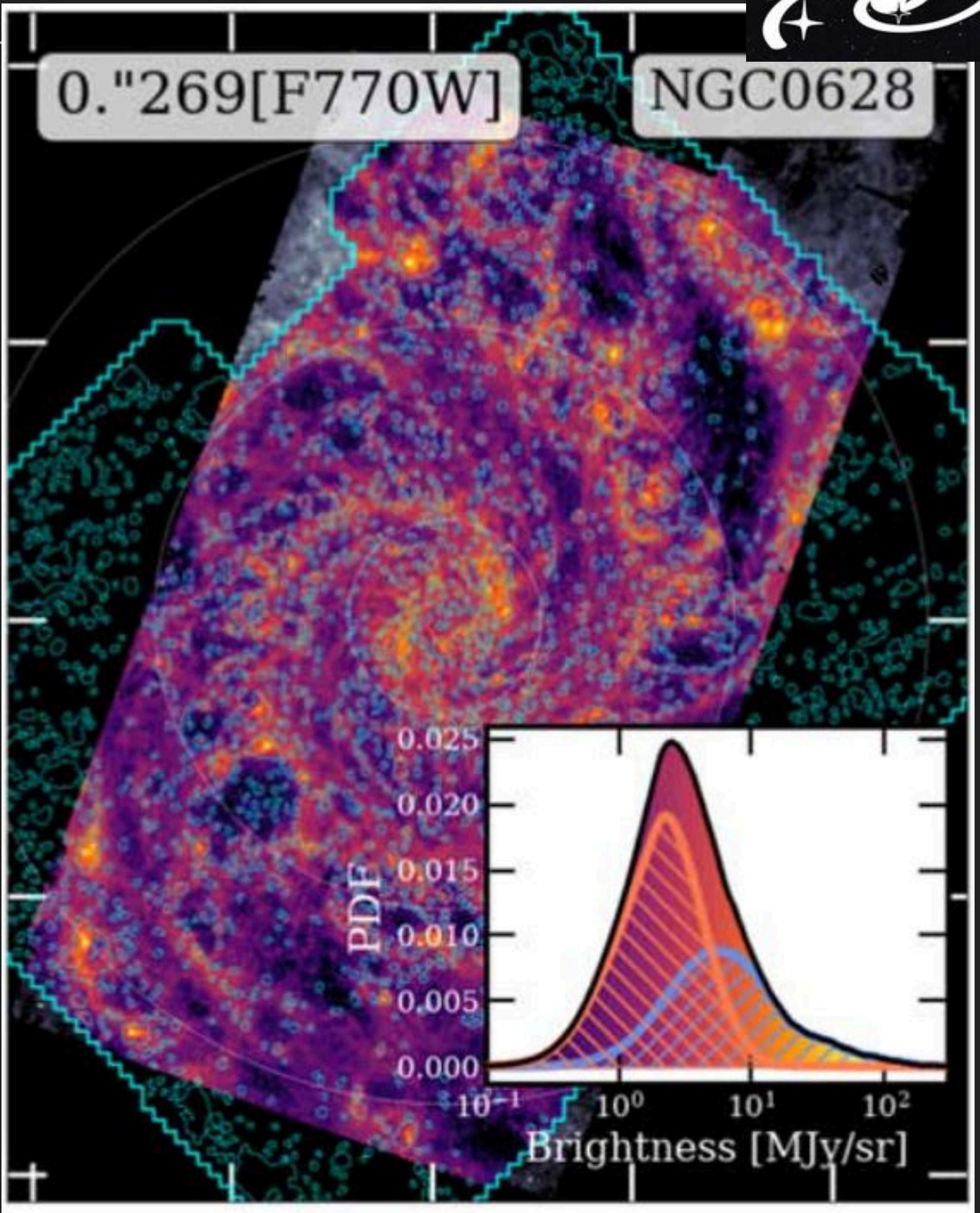
F770W F1000W F1130W F2100W

DUST, EMBEDDED STARS, AND AGN

ON PARSEC SCALES



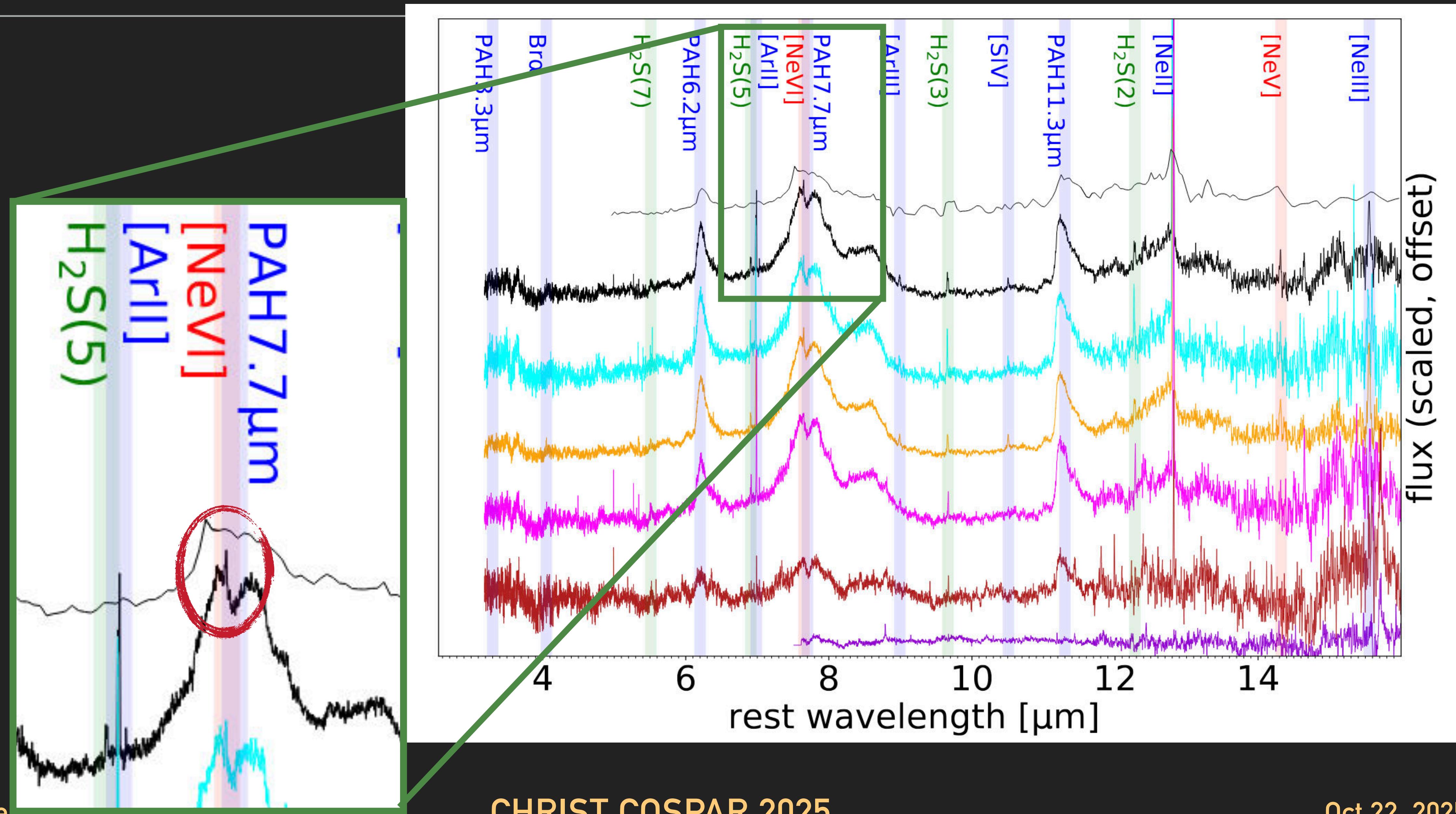
Donnelly et al. 2025



Pathak et al. 2025

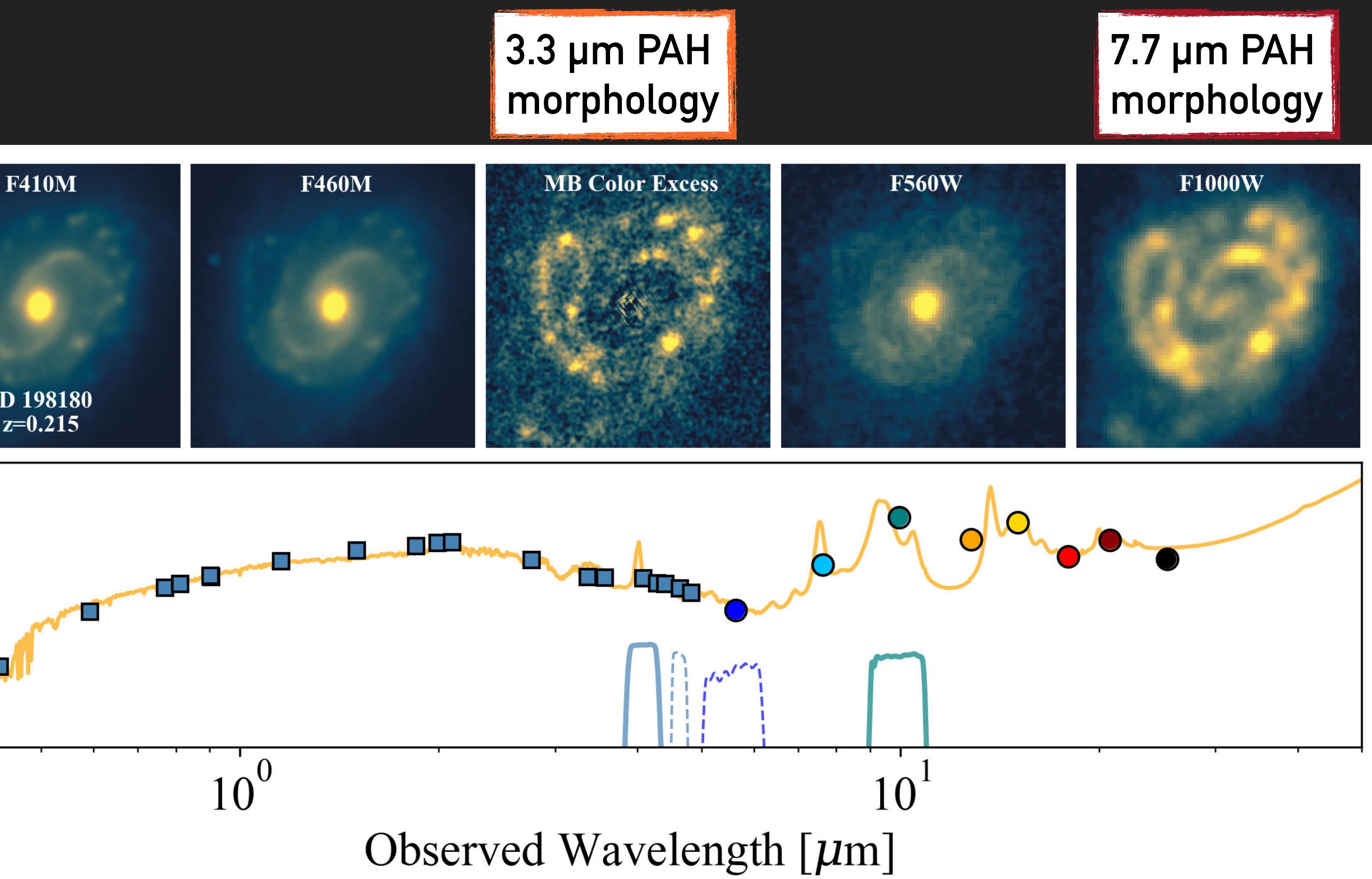
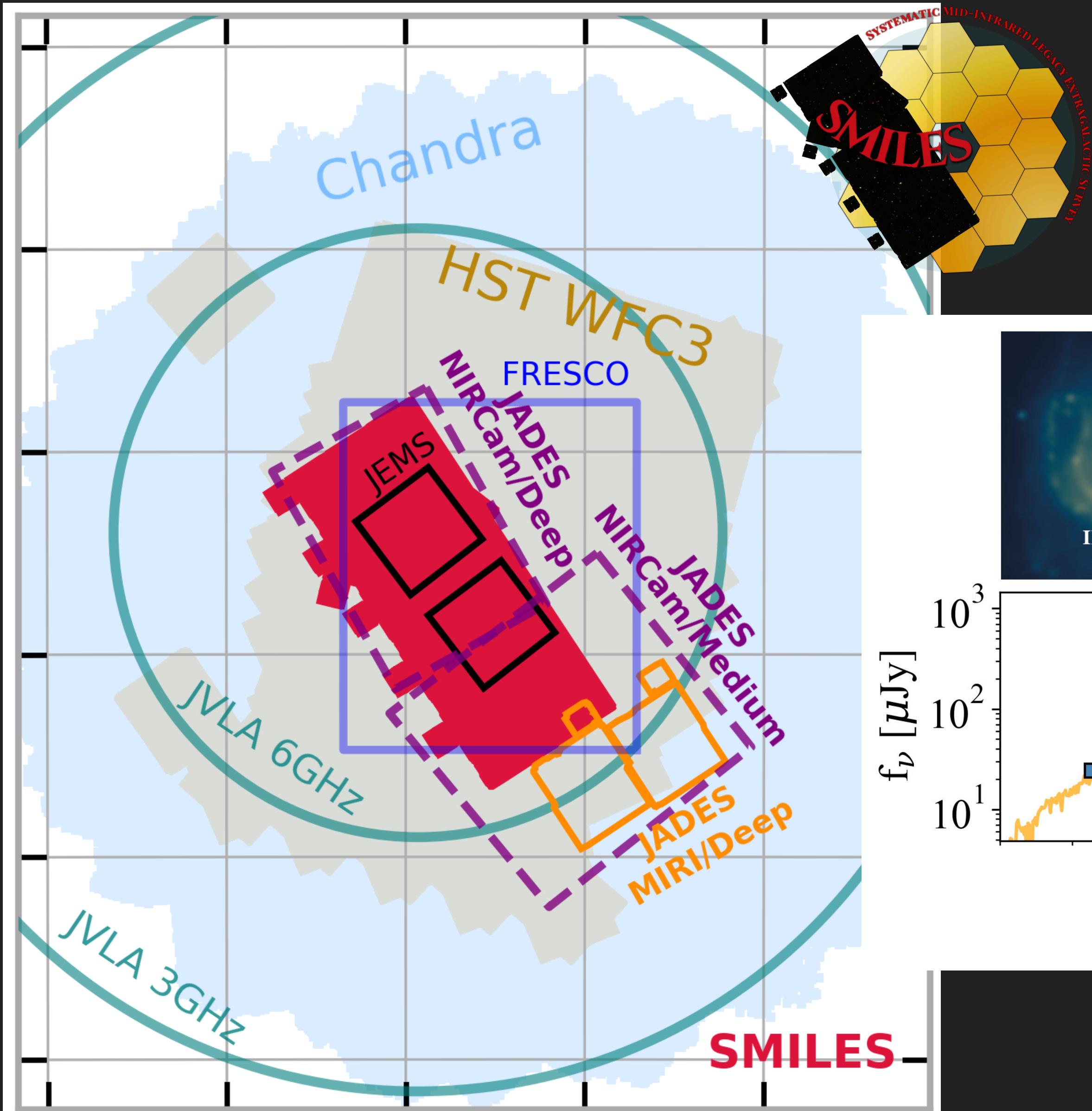


MIRI'S VIEW OF COSMIC NOON (Z~1-4)

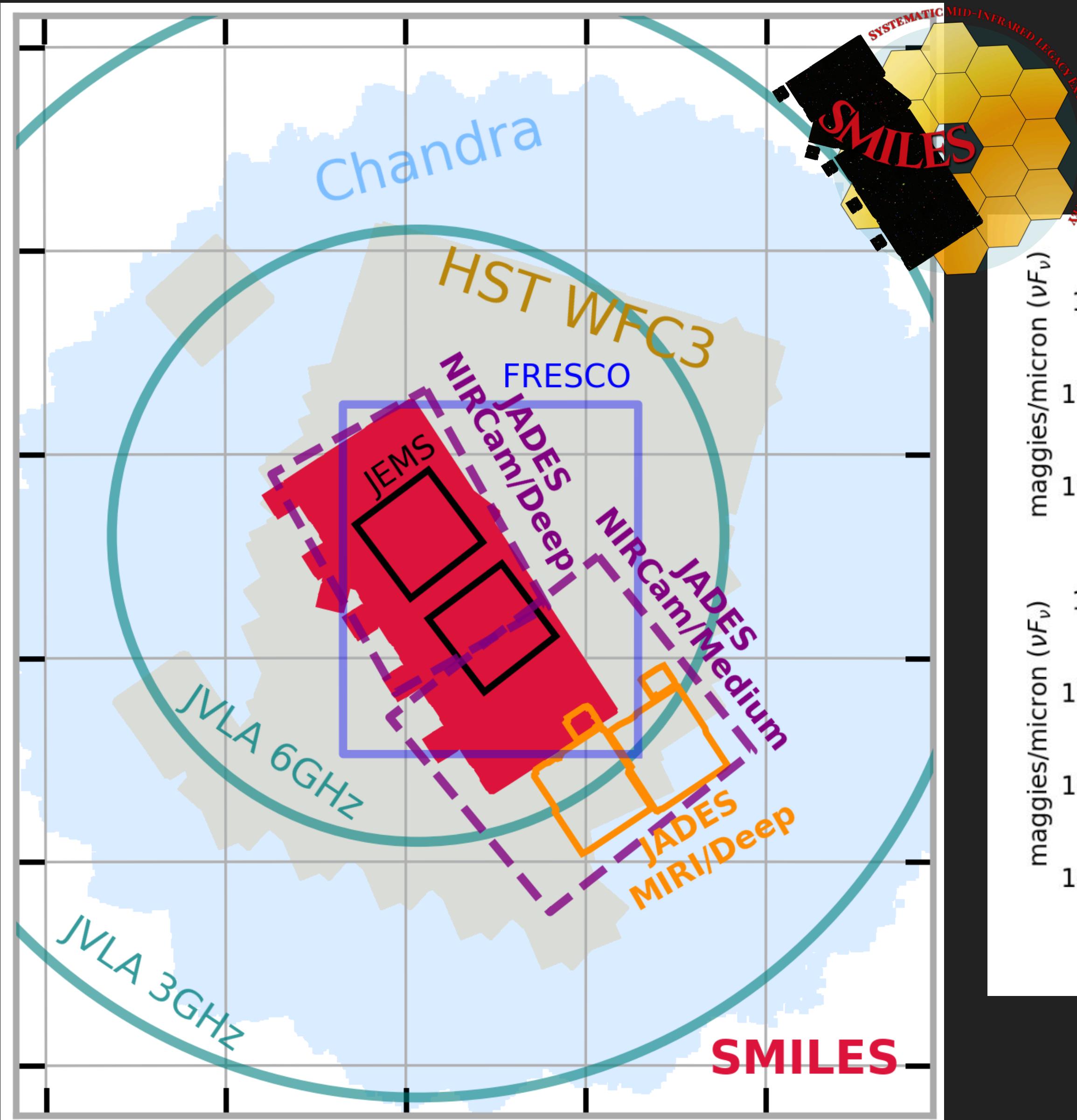


HIDDEN AGN: SMILES SURVEY

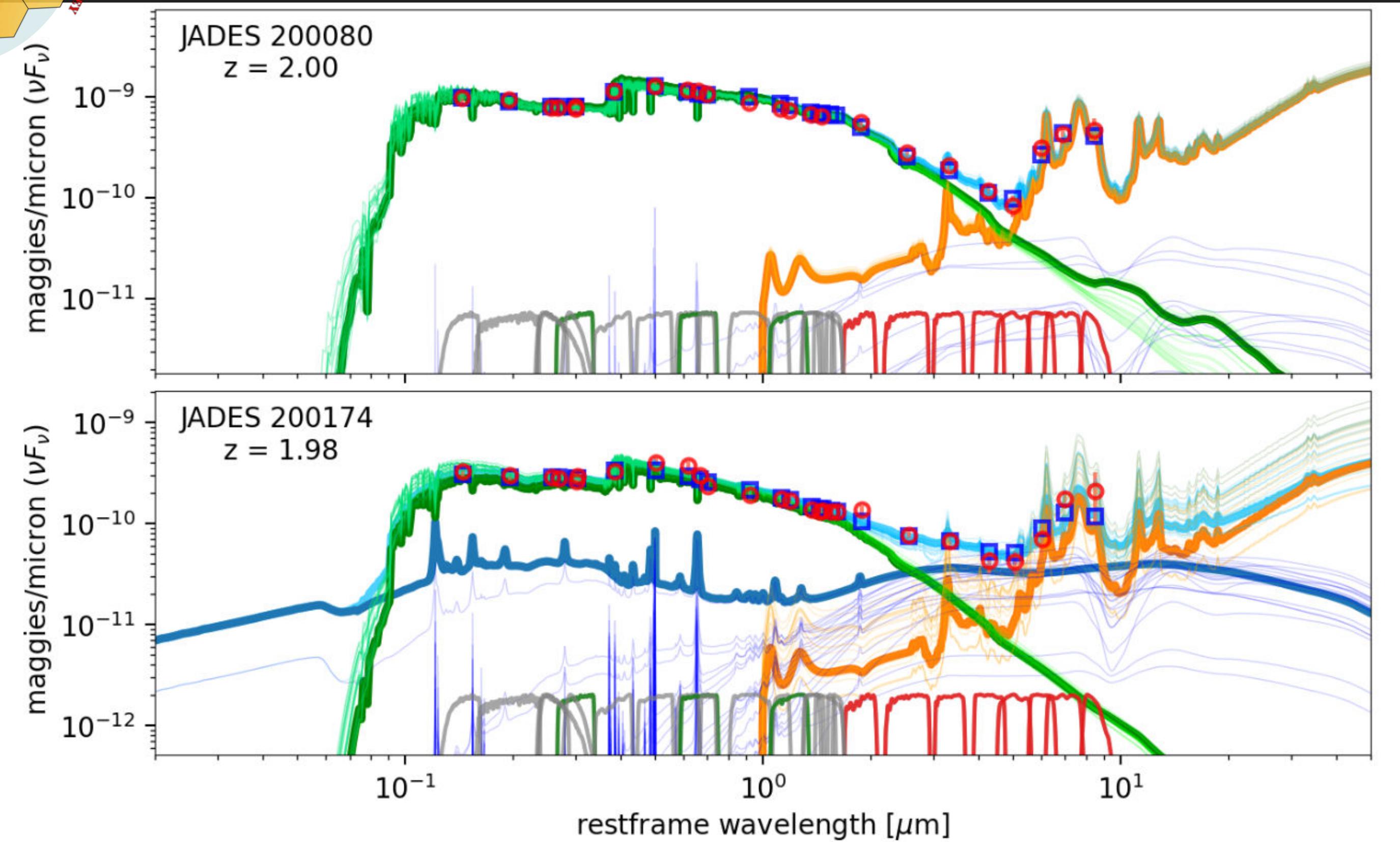
Alberts et al. 2024b



HIDDEN AGN: SMILES SURVEY

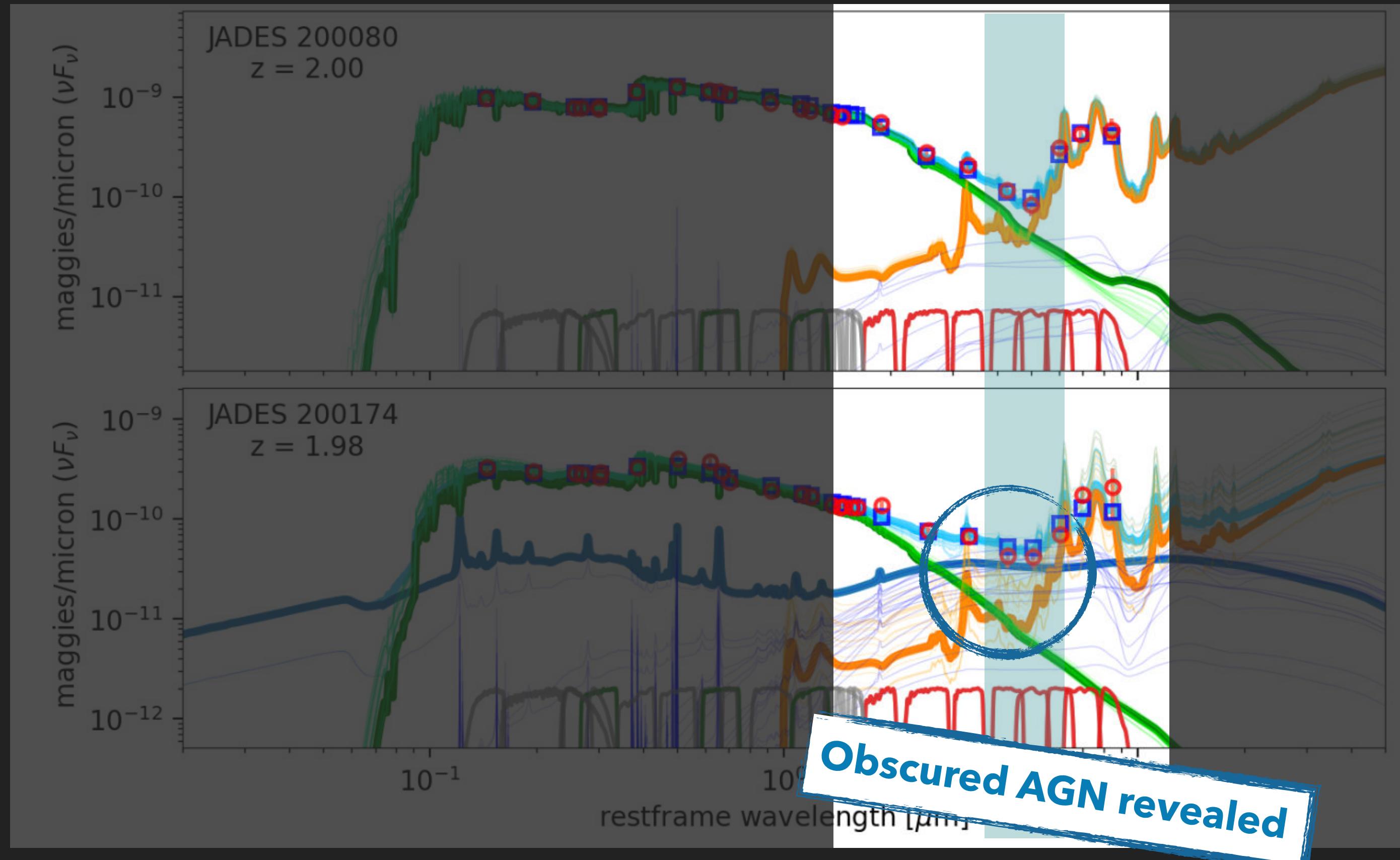
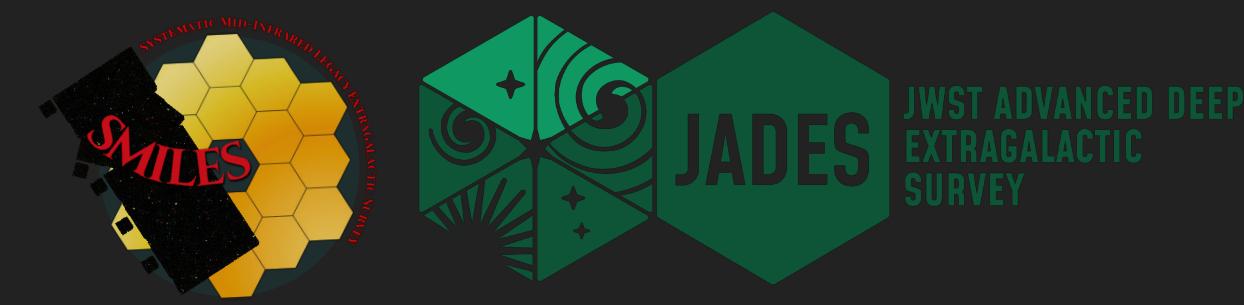


Alberts et al. 2024b



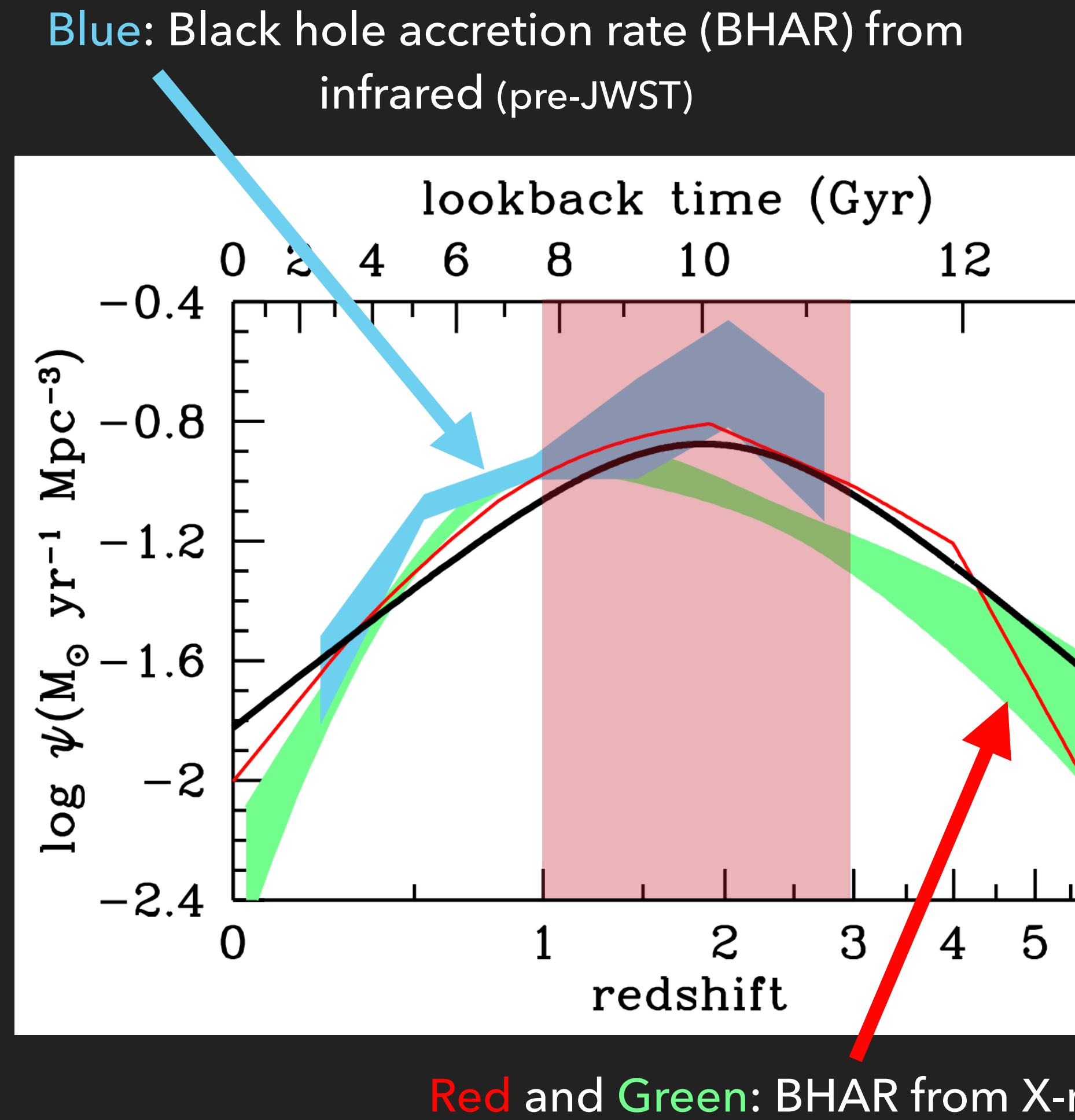
Rieke, SA et al. 2024

HIDDEN AGN: SMILES SURVEY

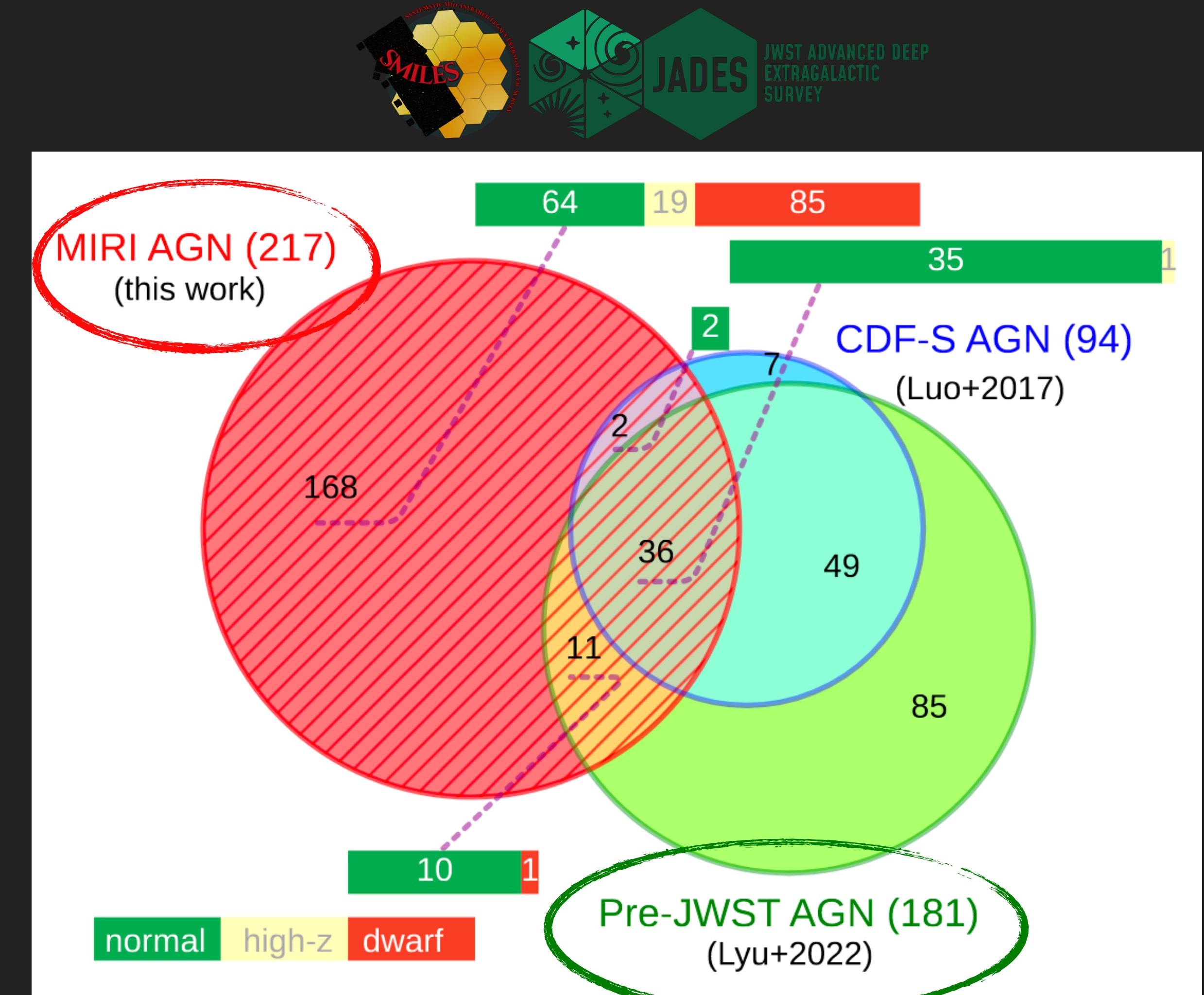


Rieke, SA et al. 2024

HIDDEN AGN: SMILES SURVEY

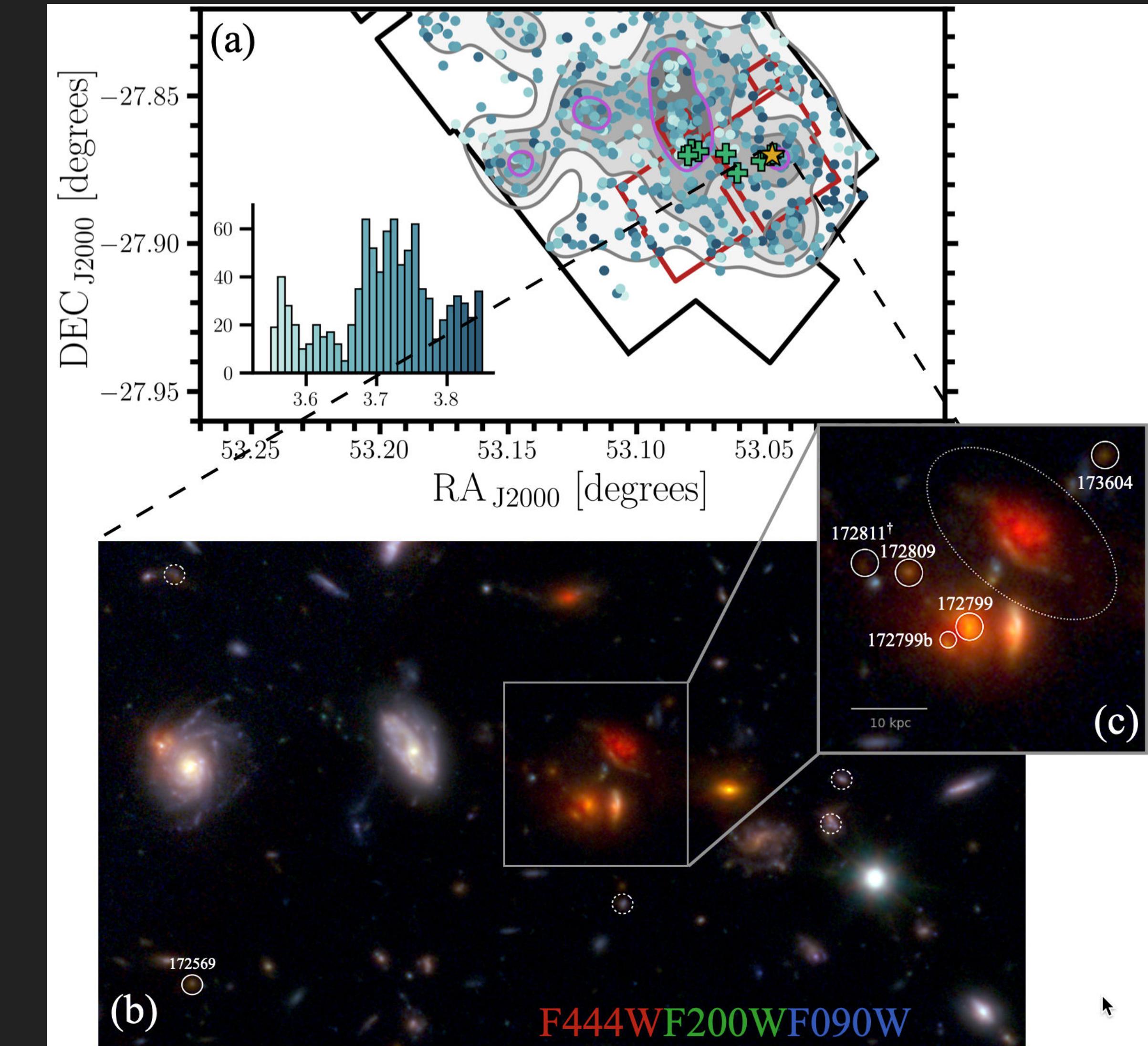
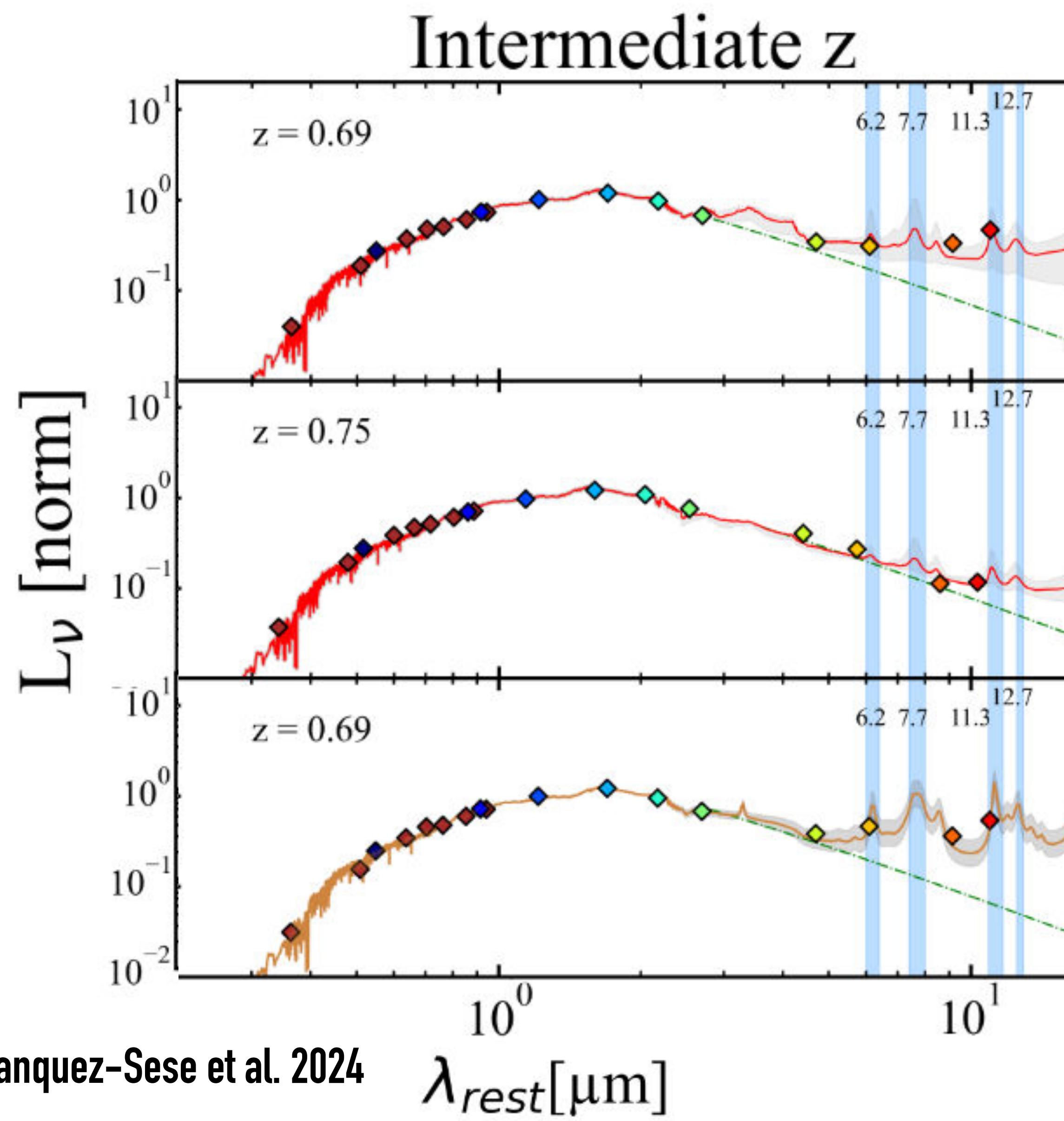
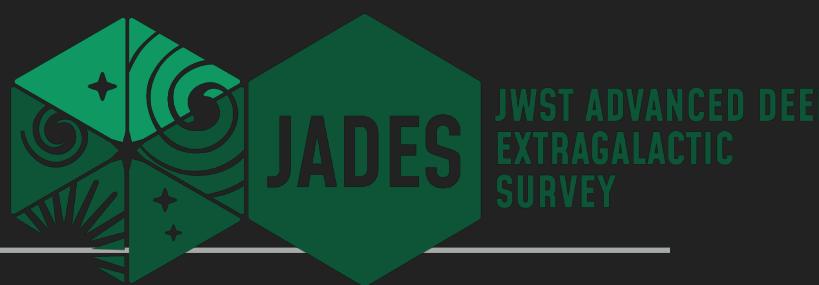


Madau & Dickinson 2014



Lyu, SA et al. 2024

DUST IN QUENCHED GALAXIES

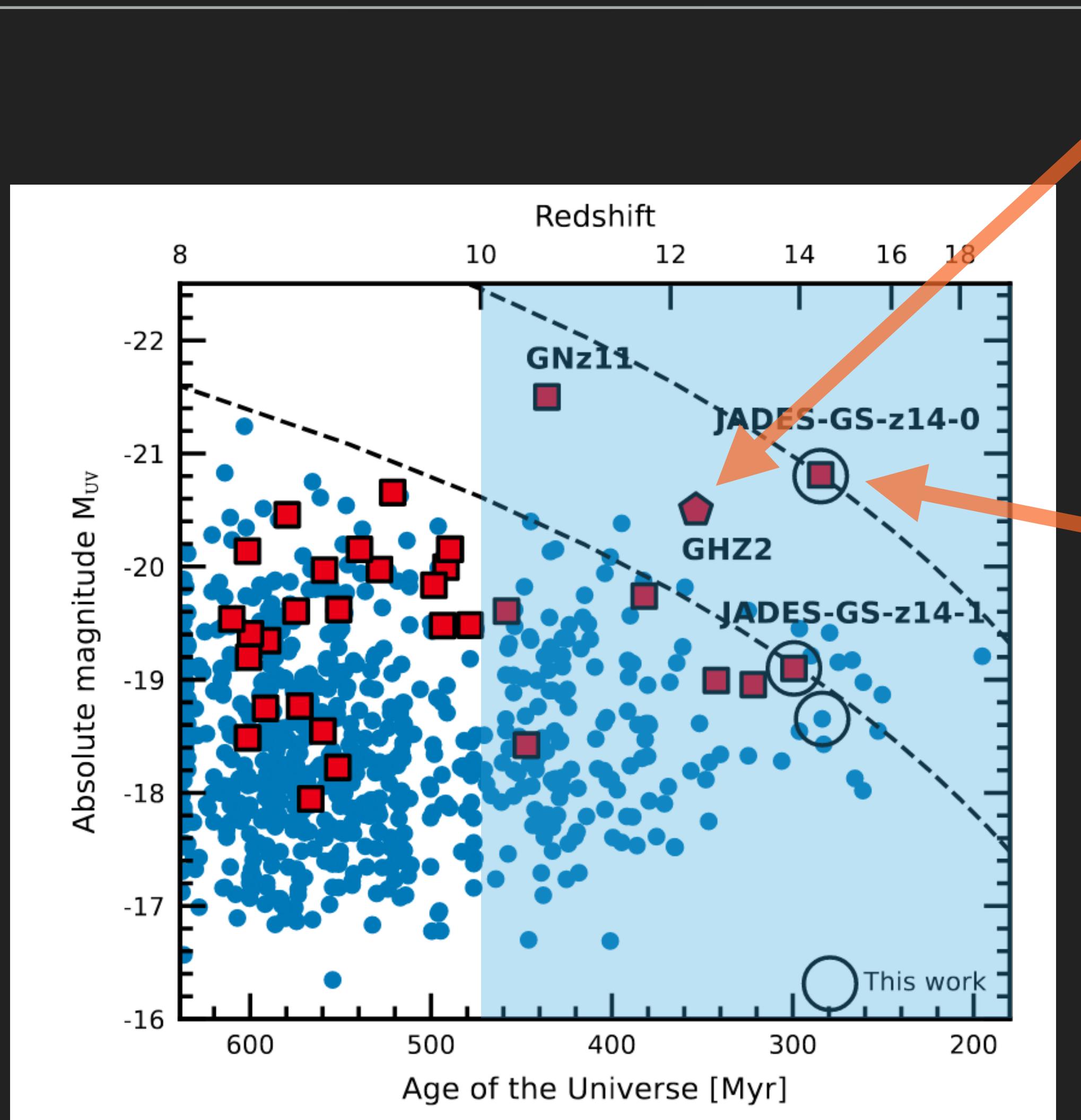




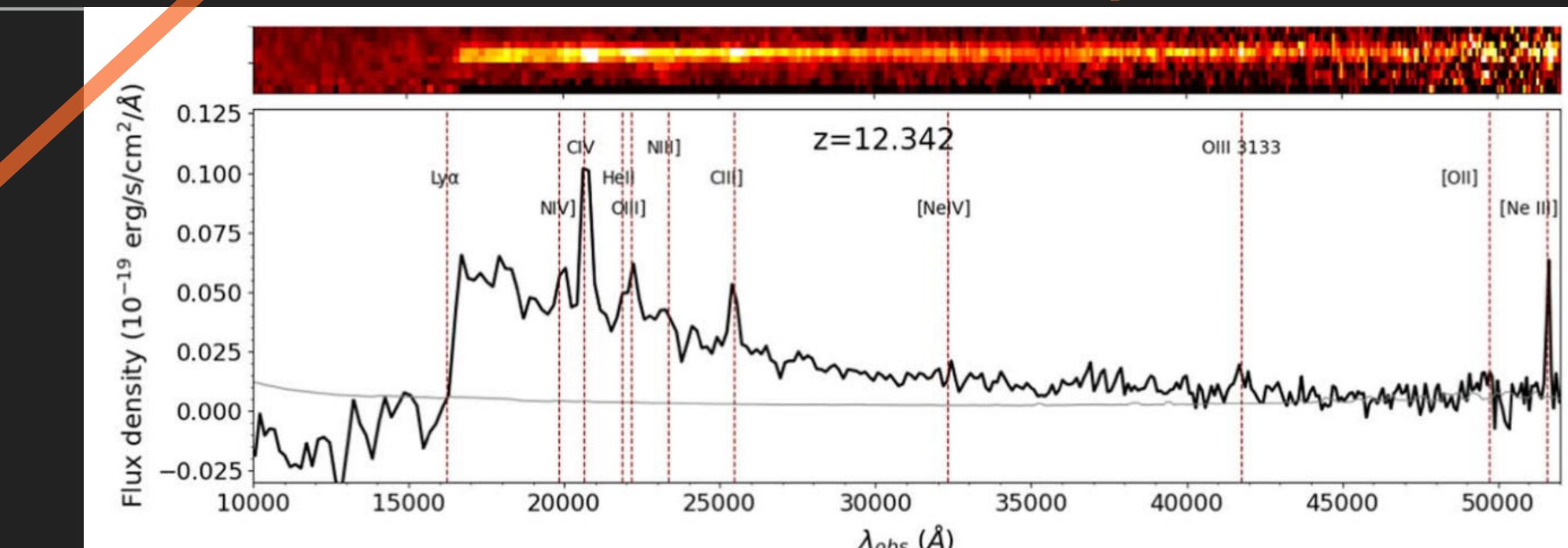
MIRI'S VIEW OF COSMIC DAWN ($Z > 10$)

MIRI AT THE REDSHIFT FRONTIER

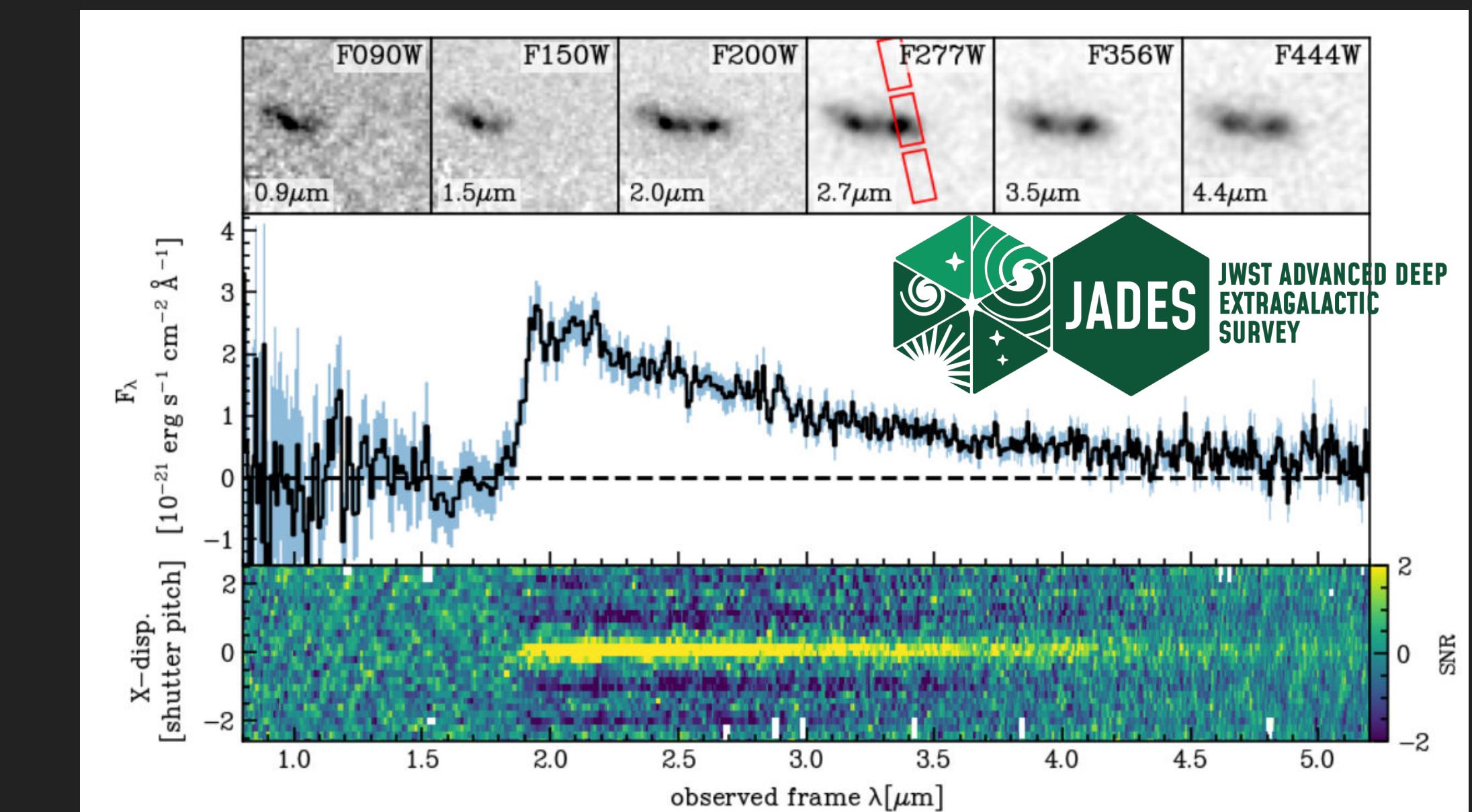
GHZ2/GLASS-z12 at $z_{\text{spec}}=12.33$



Carniani et al., 2024



JADES-GS-z14-0 at $z_{\text{spec}}=14.1796$



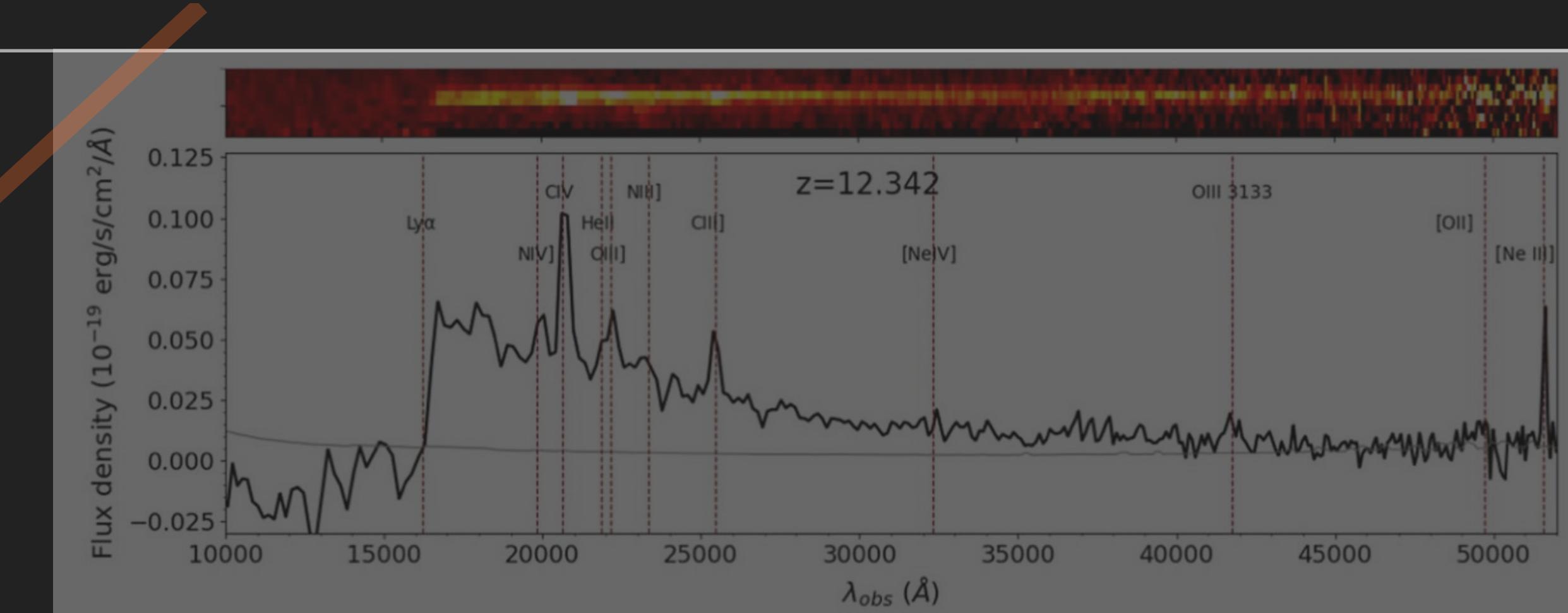
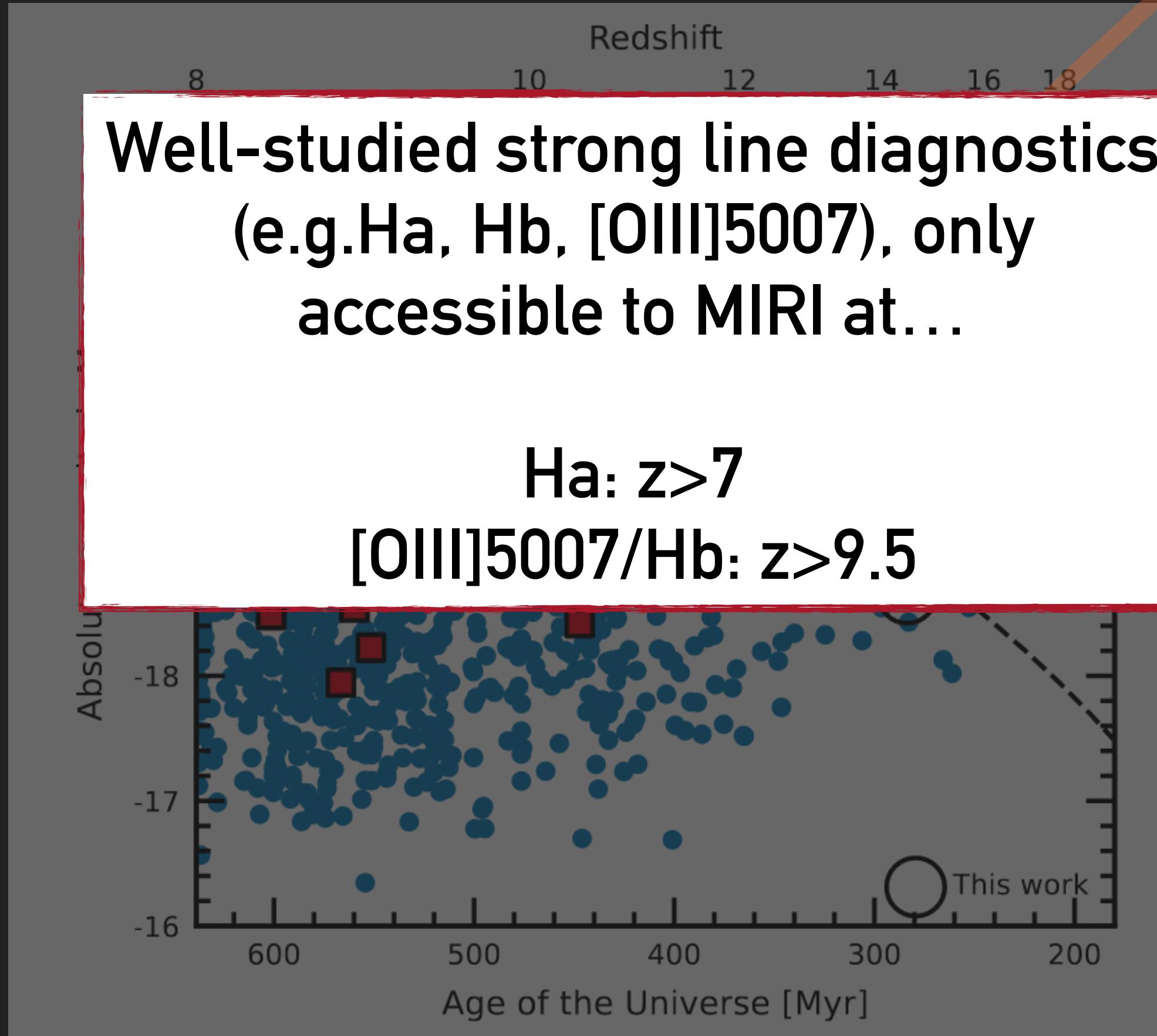
Castellano et al., 2024

Carniani et al., 2024

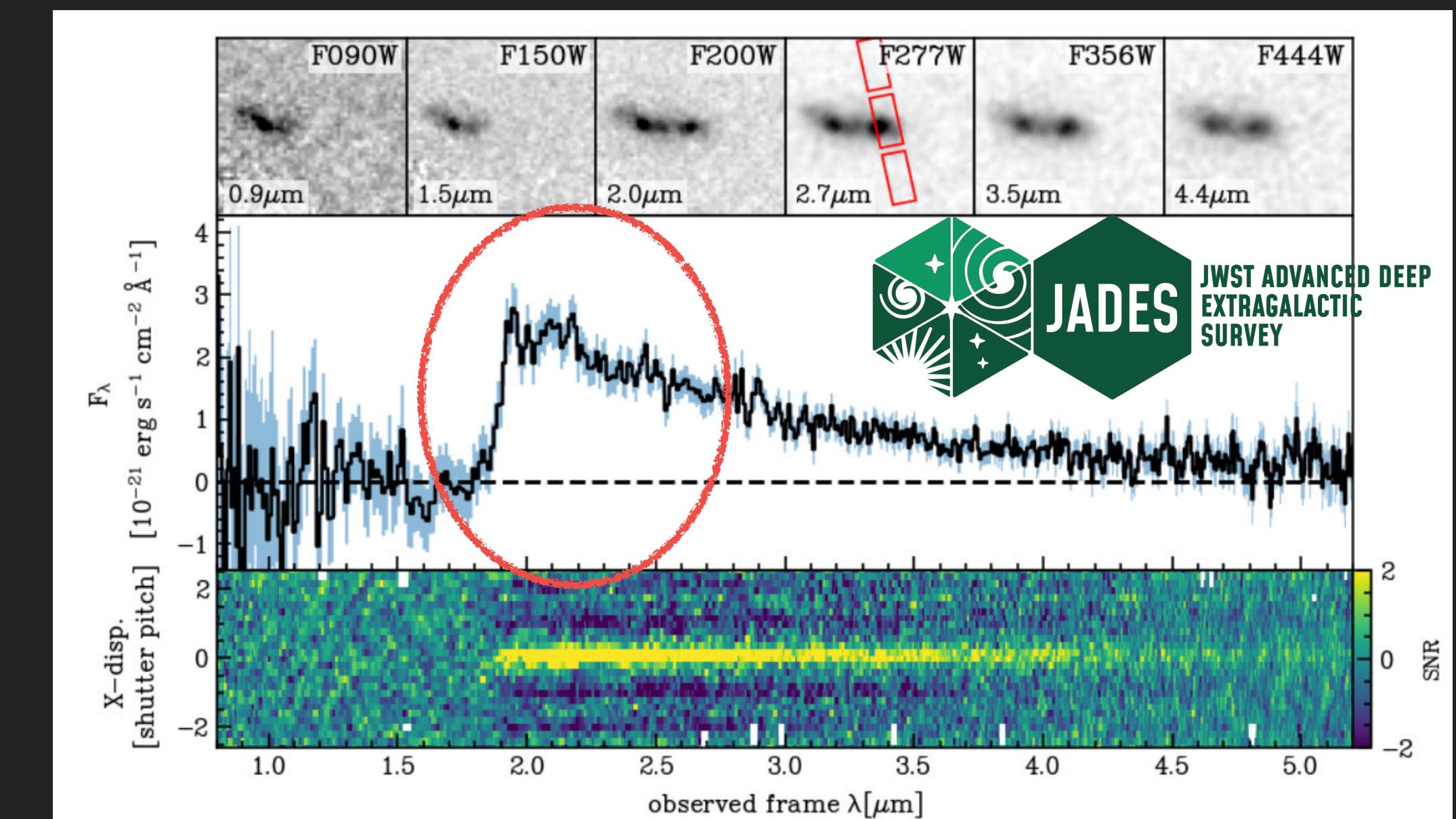
MIRI AT THE REDSHIFT FRONTIER

Castellano et al., 2024

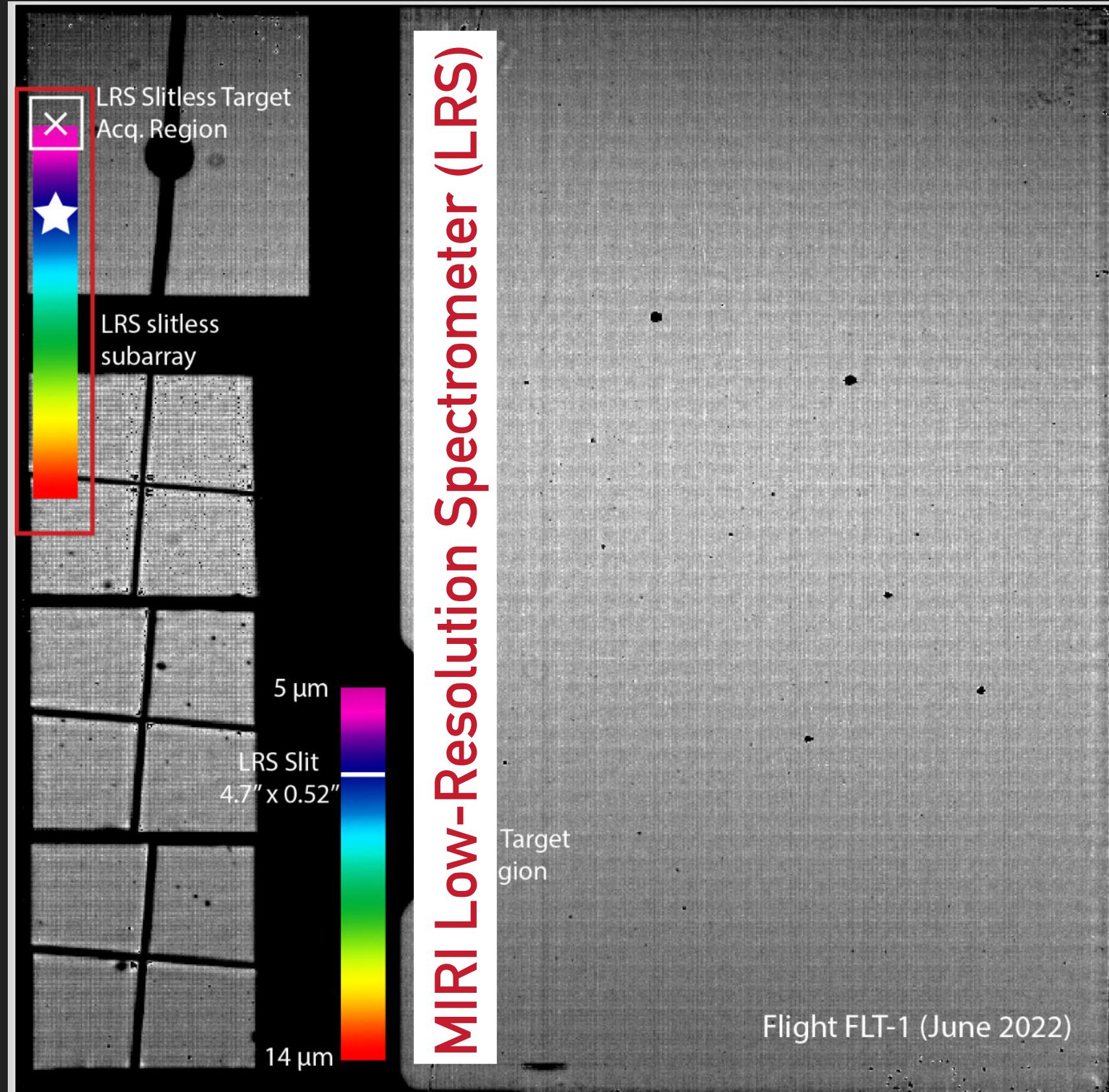
Carniani et al., 2024



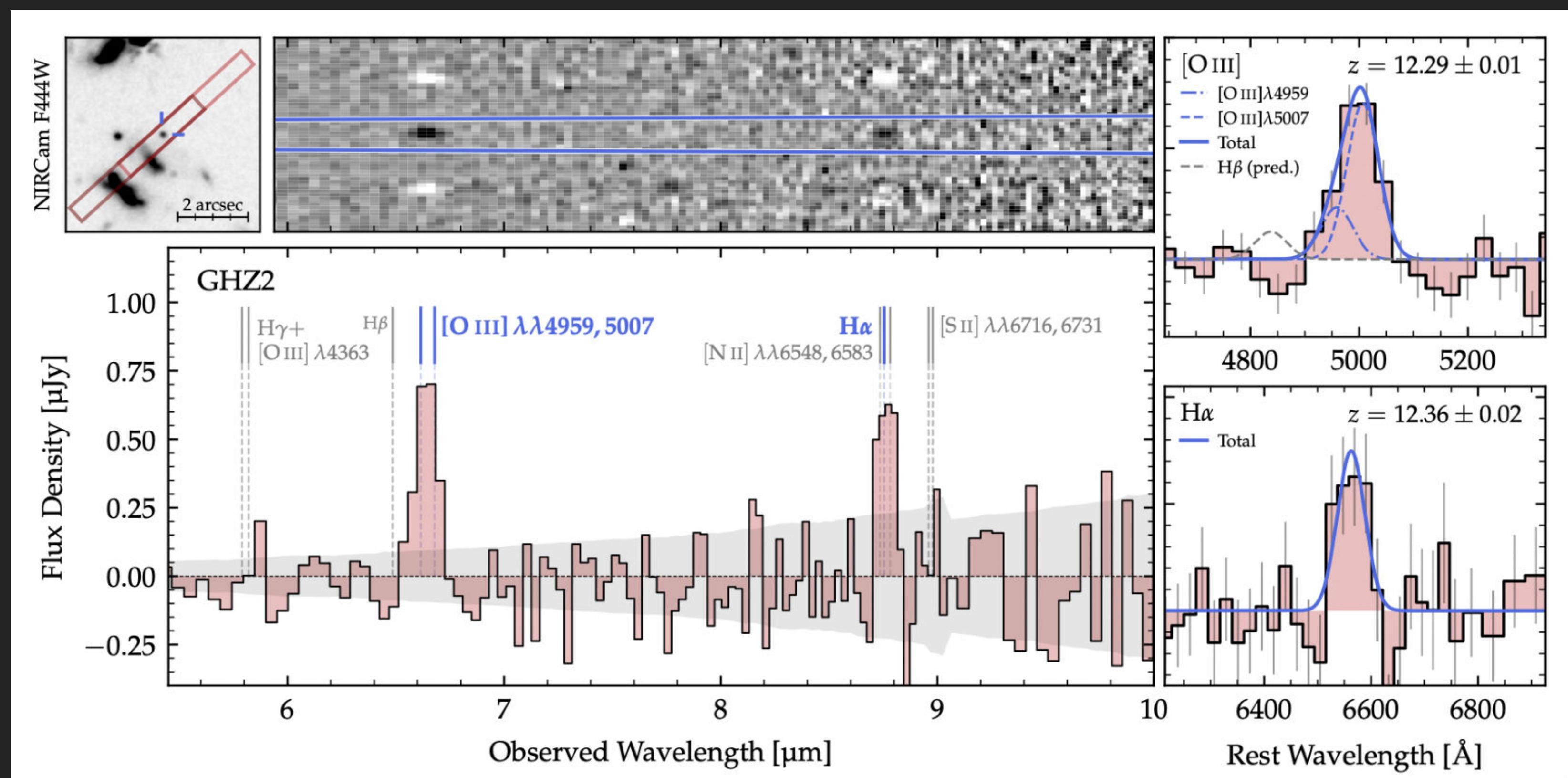
JADES-GS-z14-0 at zspec=14.1796



MIRI AT THE REDSHIFT FRONTIER



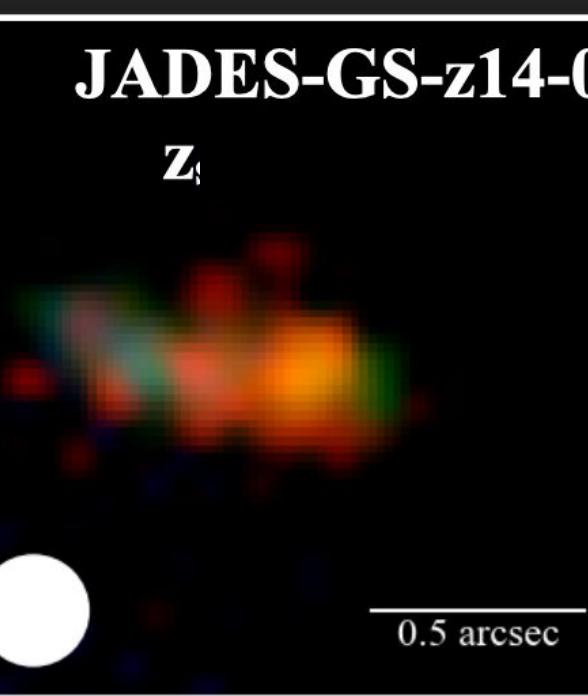
MIRI Low-Resolution Spectrometer (LRS)



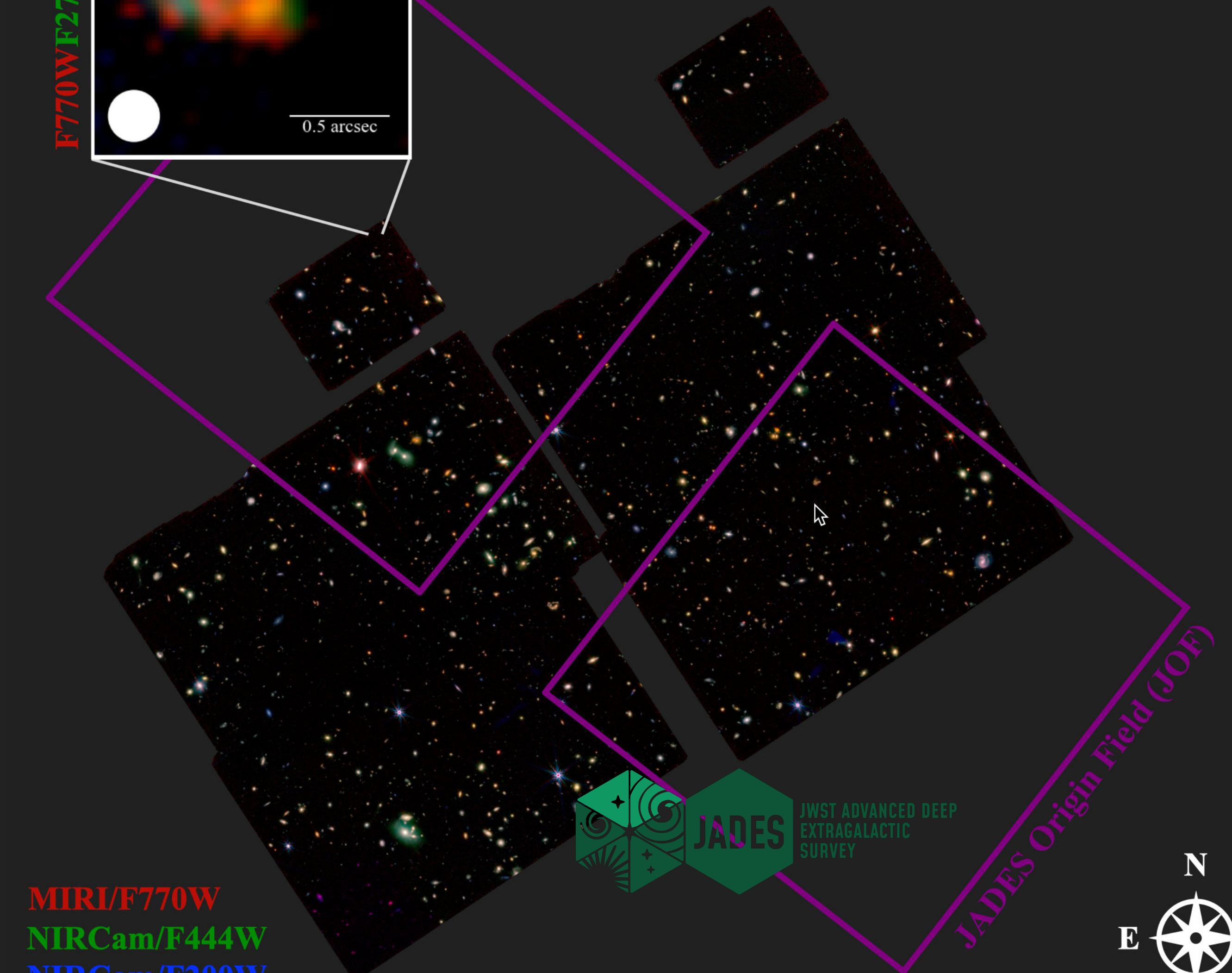
MIRI'S NEW VIEW OF COSMIC DAWN

MIRI AT THE REDSHIFT FRONTIER

F770WF277WF115W



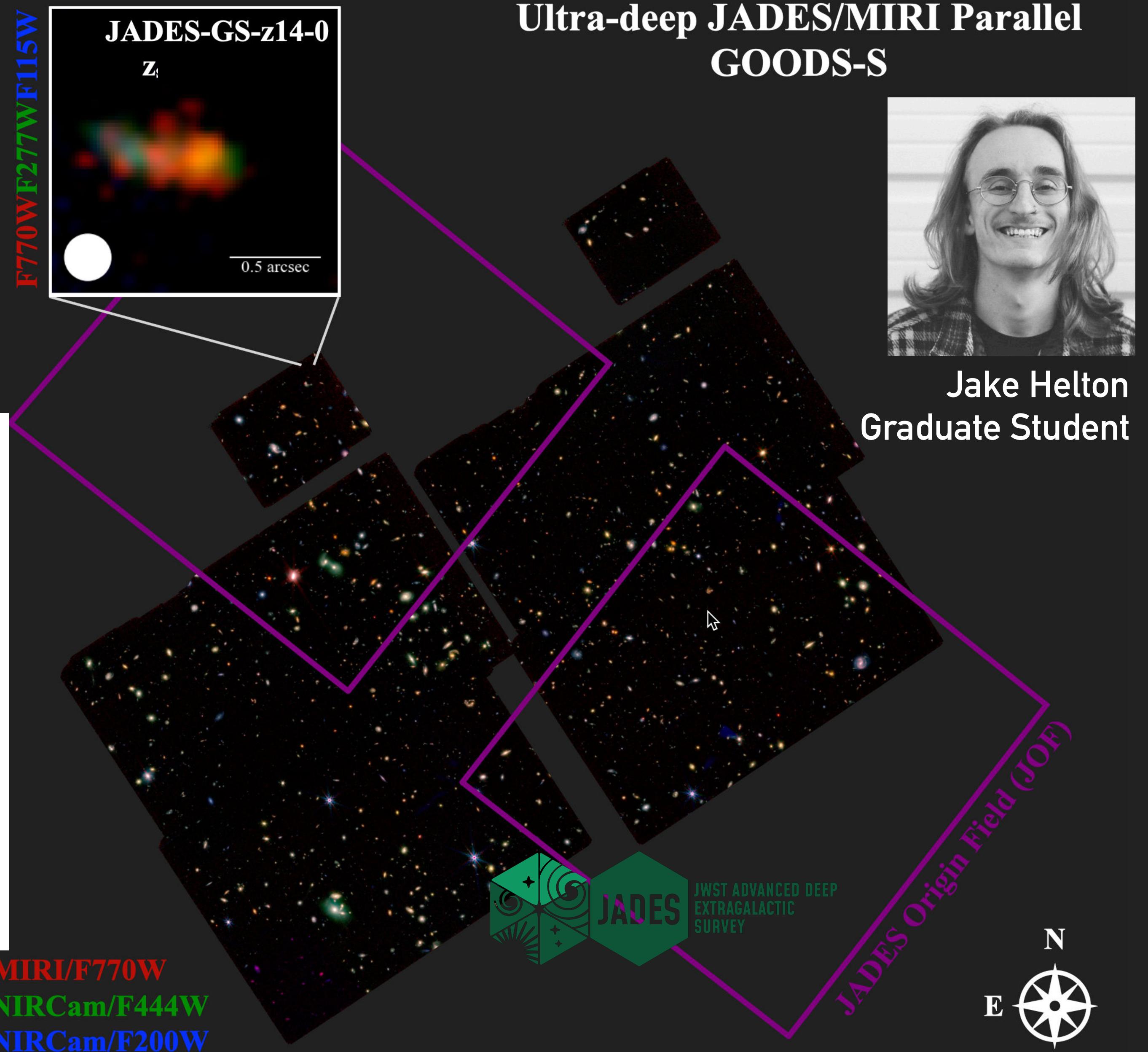
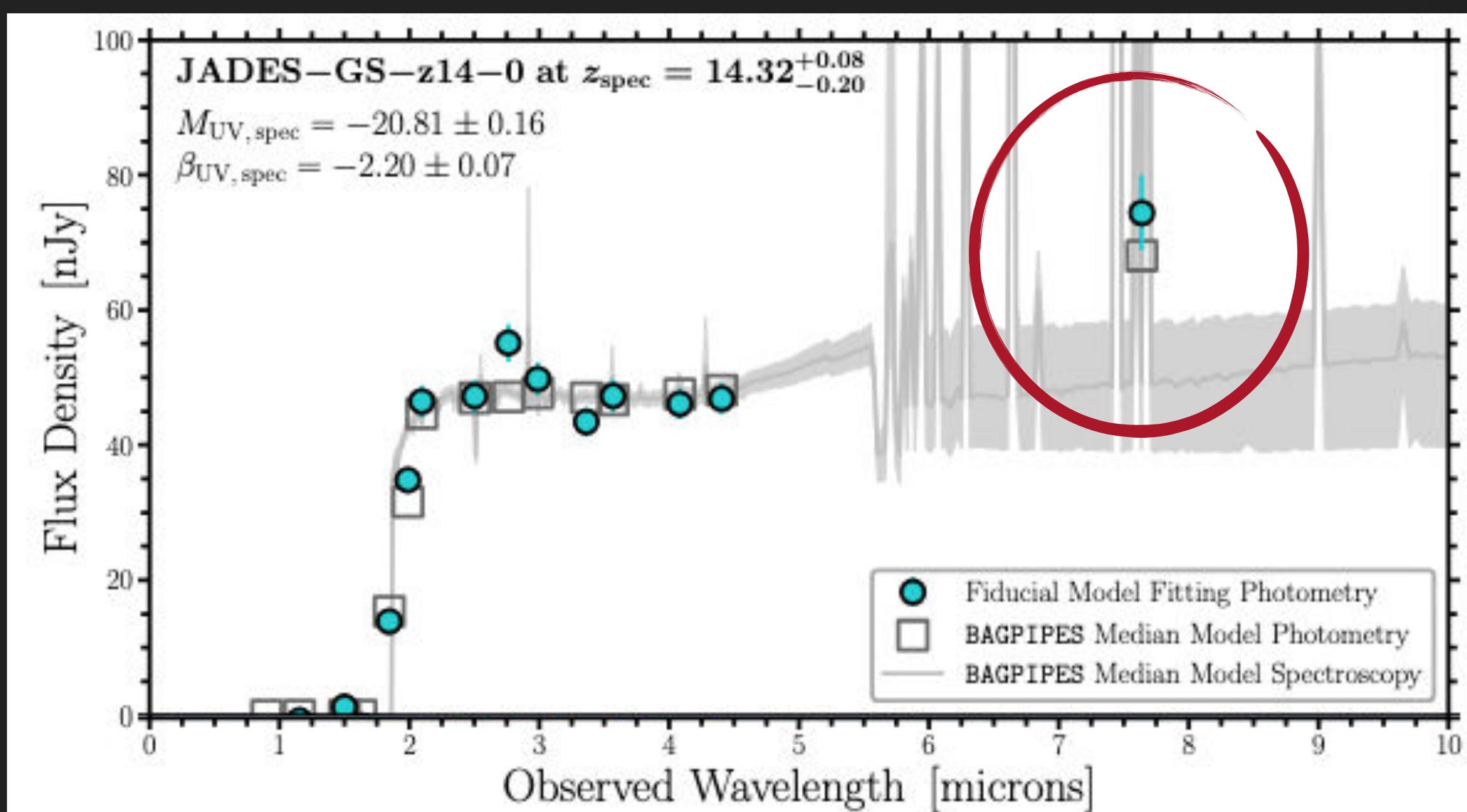
Ultra-deep JADES/MIRI Parallel
GOODS-S



MIRI'S NEW VIEW OF COSMIC DAWN

MIRI AT THE REDSHIFT FRONTIER

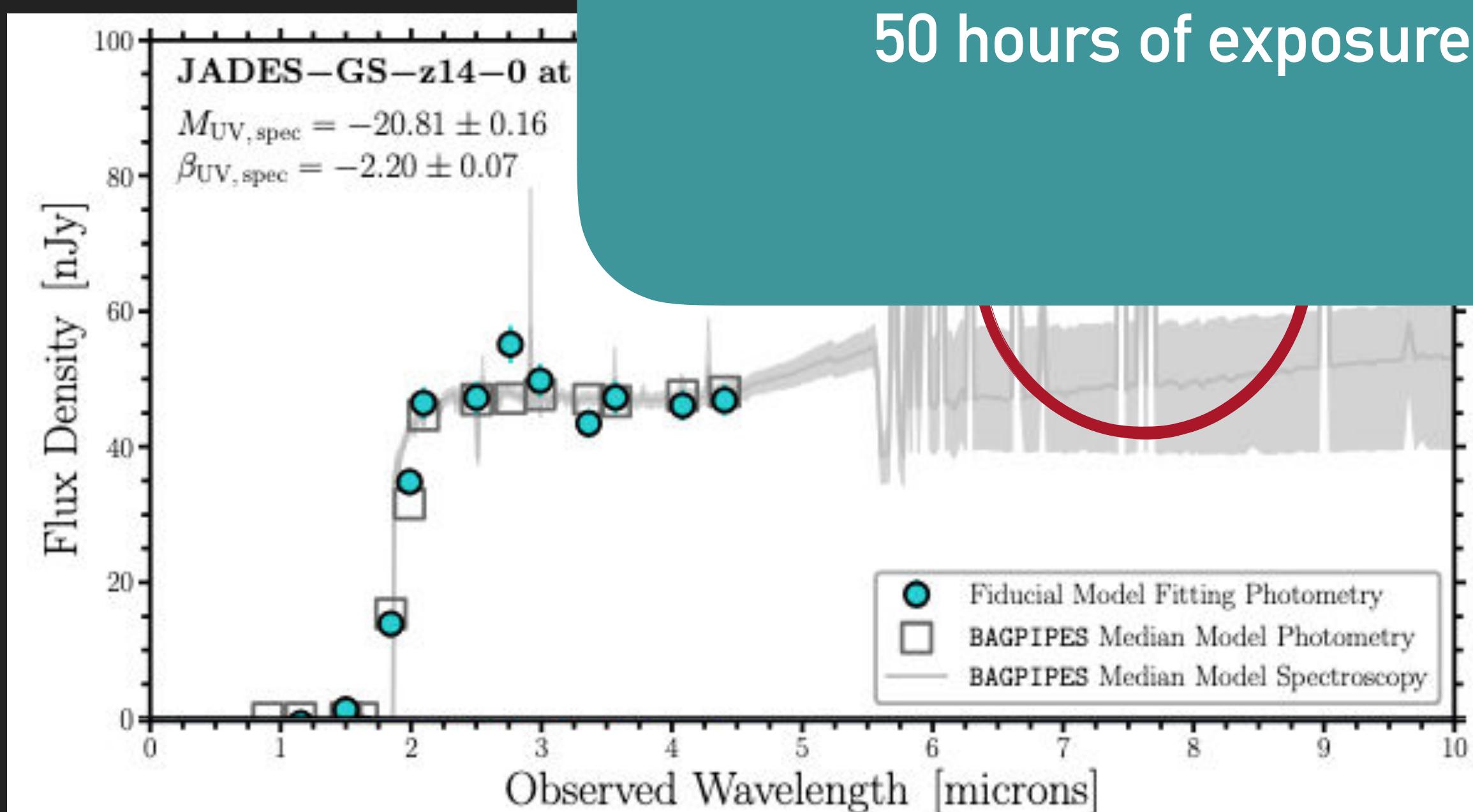
Color excess in F770W → [OIII]/H β
emission! Helton, Rieke, SA et al., 2025



MIRI'S NEW VIEW OF COSMIC DAWN

MIRI AT THE REDSHIFT FRONTIER

Color excess in FUV
emission! Helton, Ri



NEXT MONTH: MIRI/LRS AT $Z \sim 14$

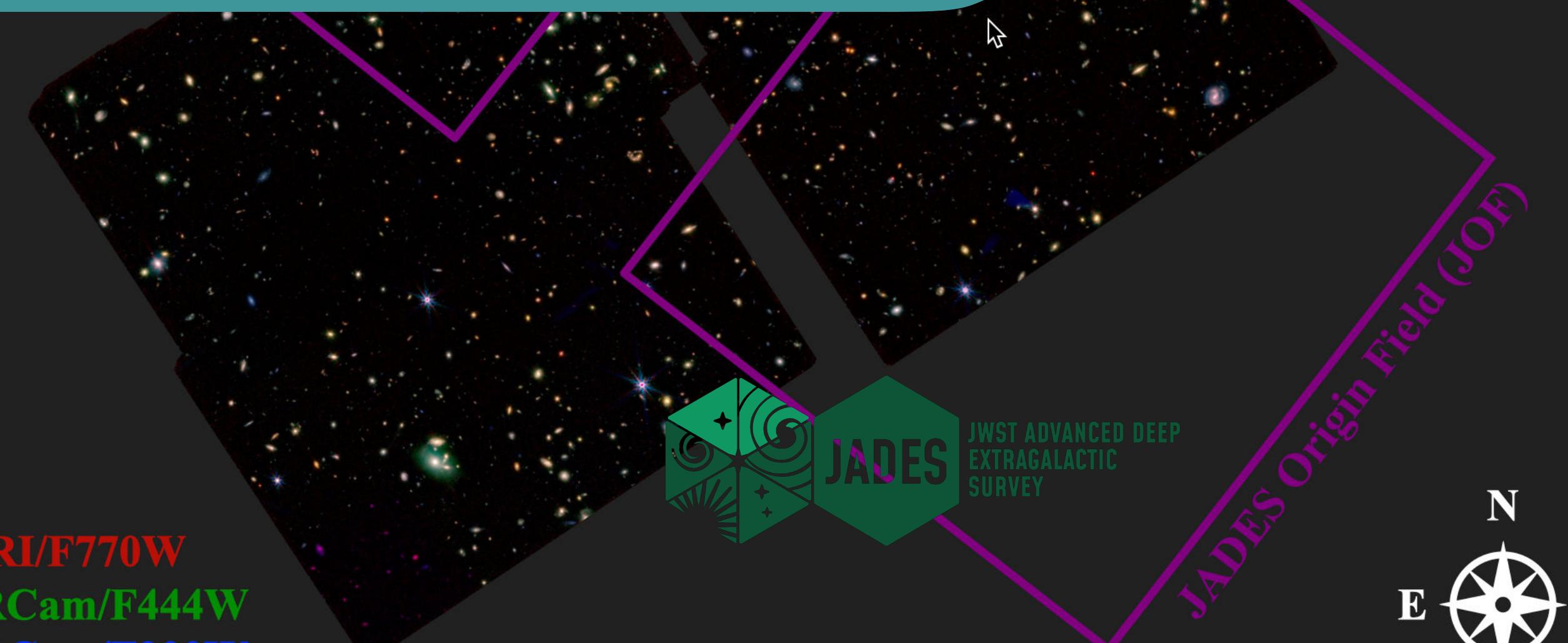
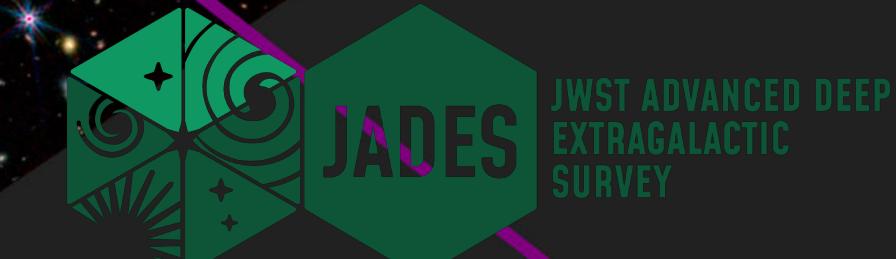
50 hours of exposure time on one object with MIRI!

MIRI/F770W
NIRCam/F444W
NIRCam/F200W

Ultra-deep JADES/MIRI Parallel
GOODS-S



Jake Helton
Graduate Student



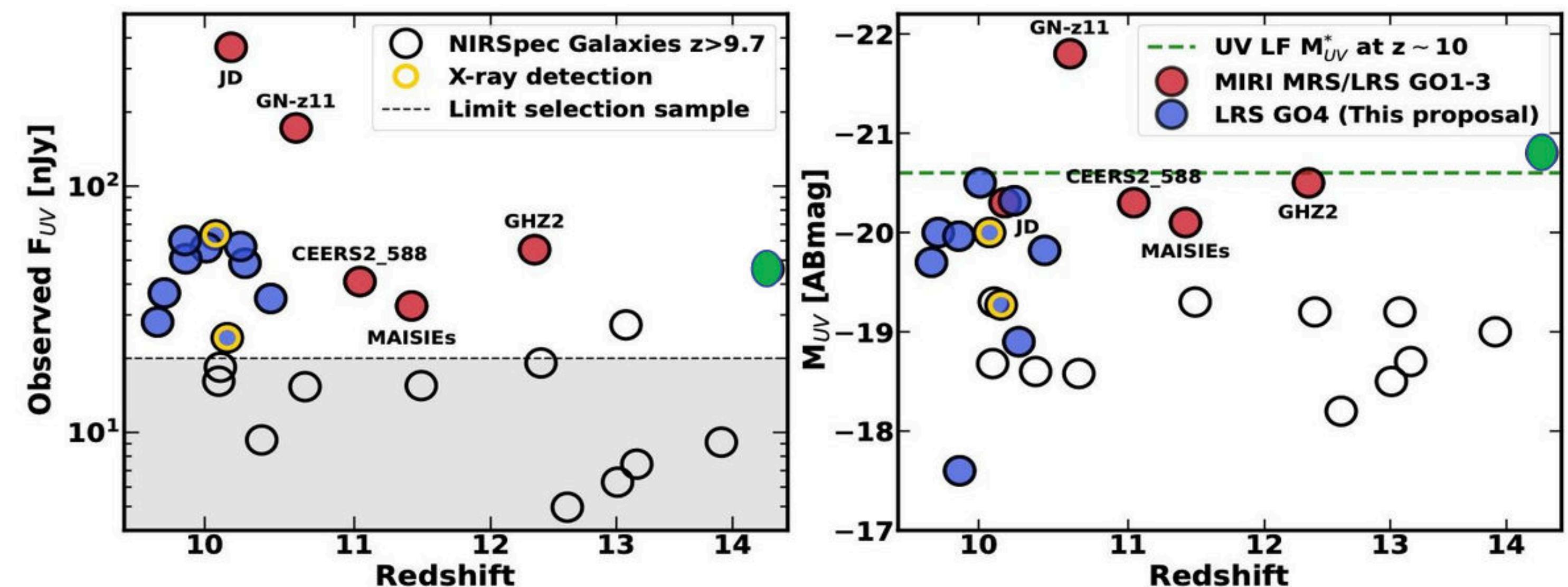
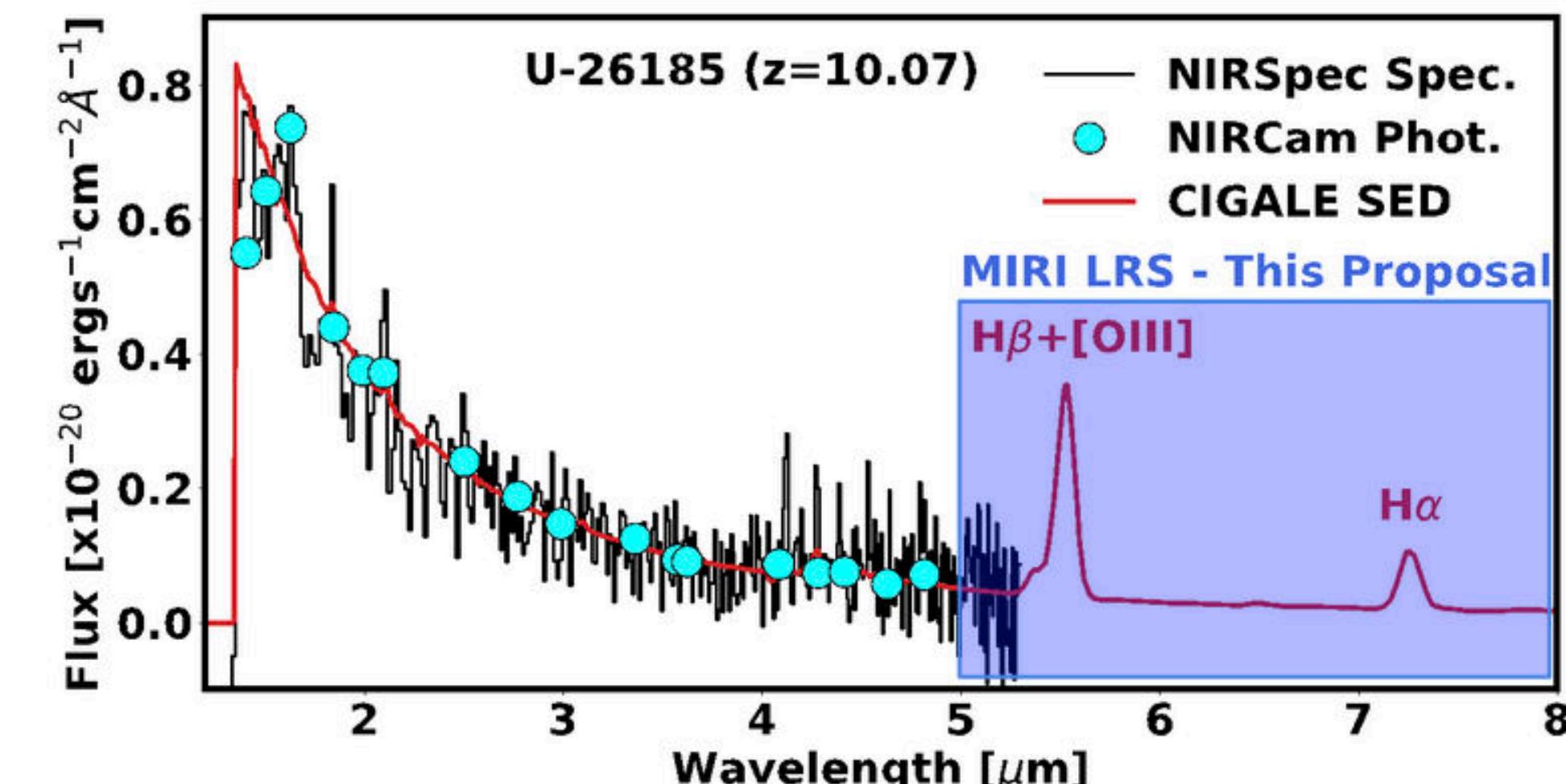
PRISMS. PRImordial galaxy Survey with MIRI-LRS Spectroscopy at z~10

JWST Cycle 4 program:

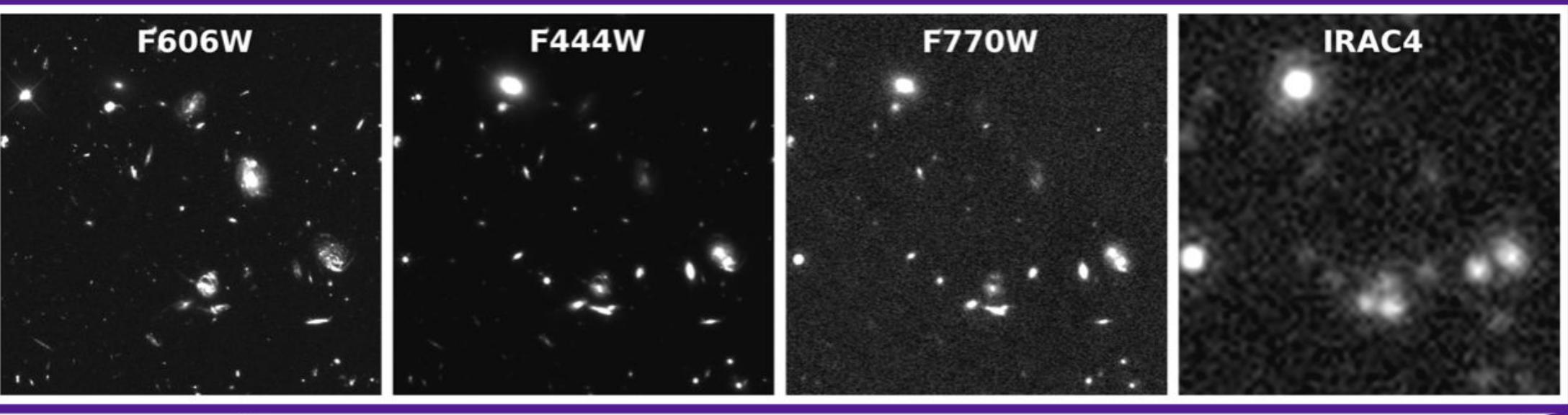
- PIs: J. Álvarez-Márquez & L. Colina
- Total of 129 hours
- Observed between 2025 to 2026
- MIRI low resolution spectroscopy
- Survey of 10 galaxies at $z \sim 10$
- Detection of $\text{H}\beta + [\text{OIII}]$ & $\text{H}\alpha$

First statistical study of the ISM properties (SFR, dust, metallicity, ionization, ...) of galaxies 500 Myr after the Big Bang.

Credit: Javier Alvarez-Marquez

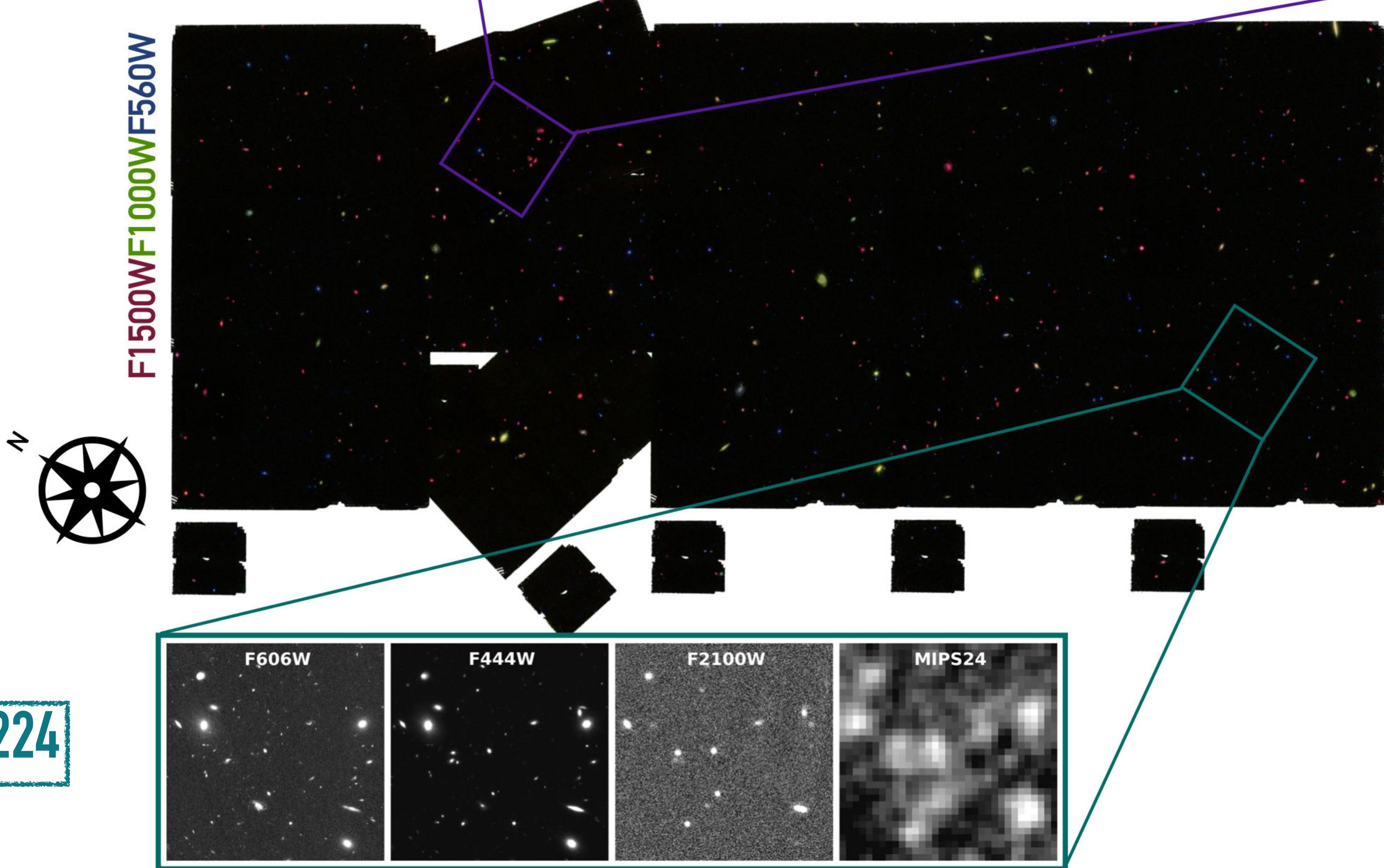


SMILES FIRST DATA RELEASE



<https://archive.stsci.edu/hlsp/smiles>

- ▶ MAST HLSP
- ▶ 8 mosaics
- ▶ 3000+ catalog sources, measurements in all bands



Alberts et al. 2024b, ApJ, 976, 224