Trying to Reproduce Published JWST Results on NGC 346

CHRIST COSPAR 2025

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NGC 346

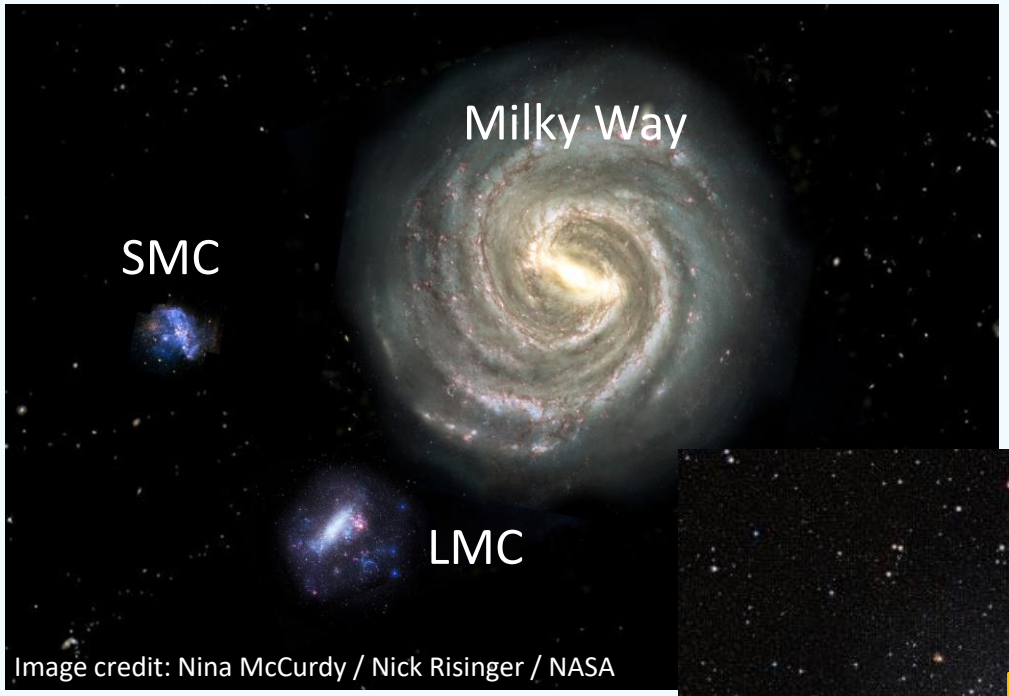

Image credit: Nina McCurdy / Nick Risinger / NASA

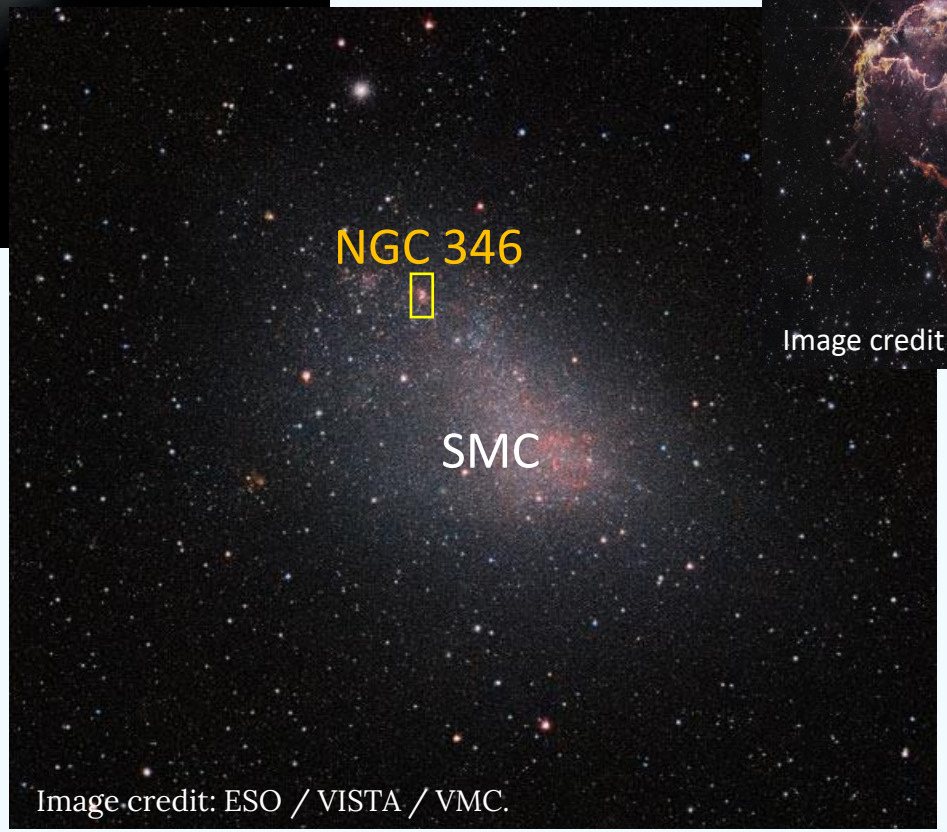

Image credit: ESO / VISTA / VMC.

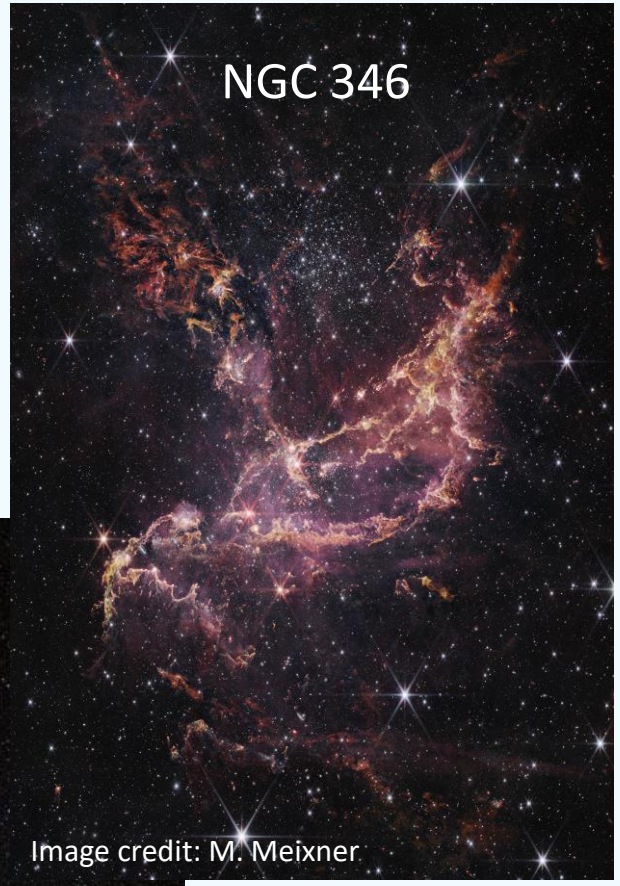

Image credit: M. Meixner

Brightest and most active star forming region

D = 62000 ± 420 pc

$Z = 0.2\ Z_{\odot}$

500 new PMS and YSO candidates: JWST's Near Infrared Camera (Habel et al. (2024))

Baseline Paper

A Mid-Infrared Spectroscopic Study of Young Stellar Objects in the SMC Region NGC 346: JWST Detects Dust, Accretion, Ices and Outflows

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[14] *AURA for the European Space Agency, Space Telescope Science Institute*

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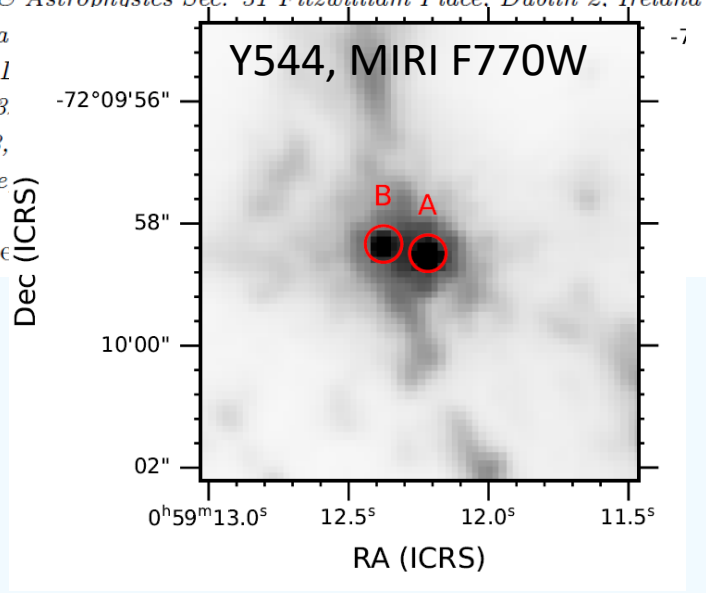


Target: Young Stellar Object -- Y544

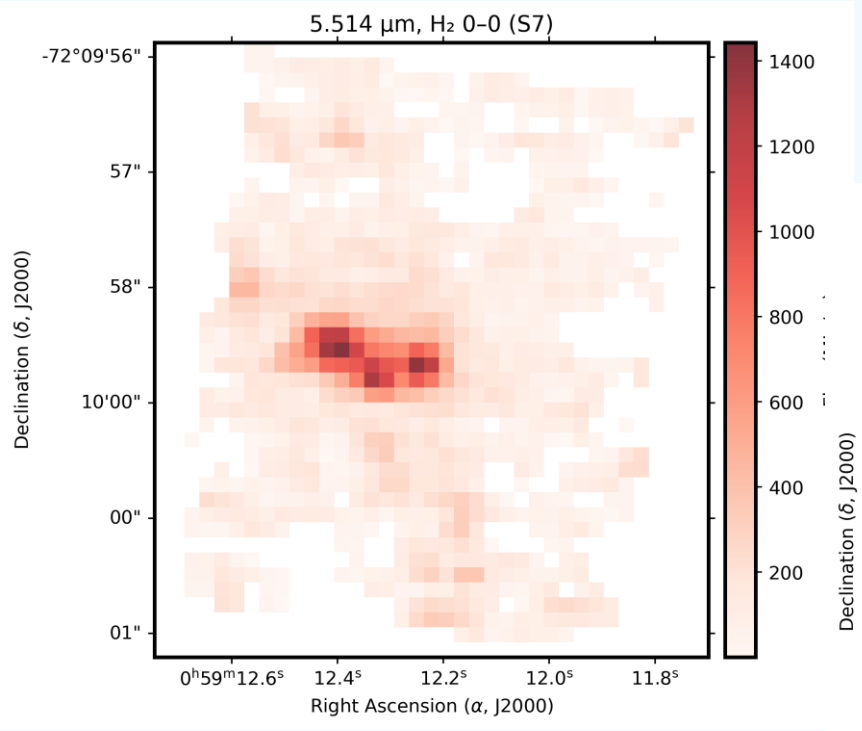
Sewilo et al. (2013)

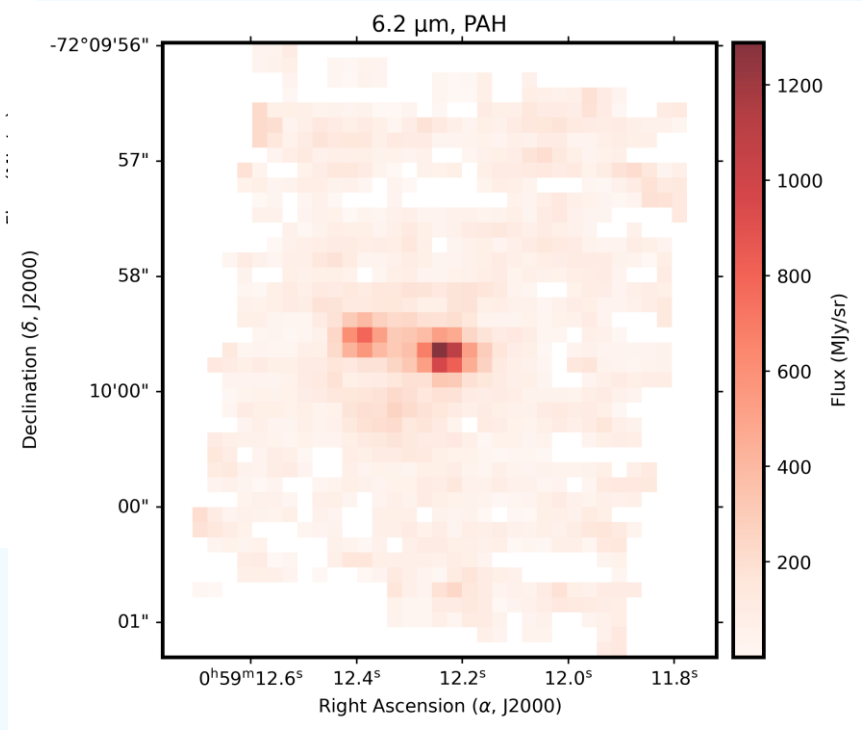
Herbig Ae/Be

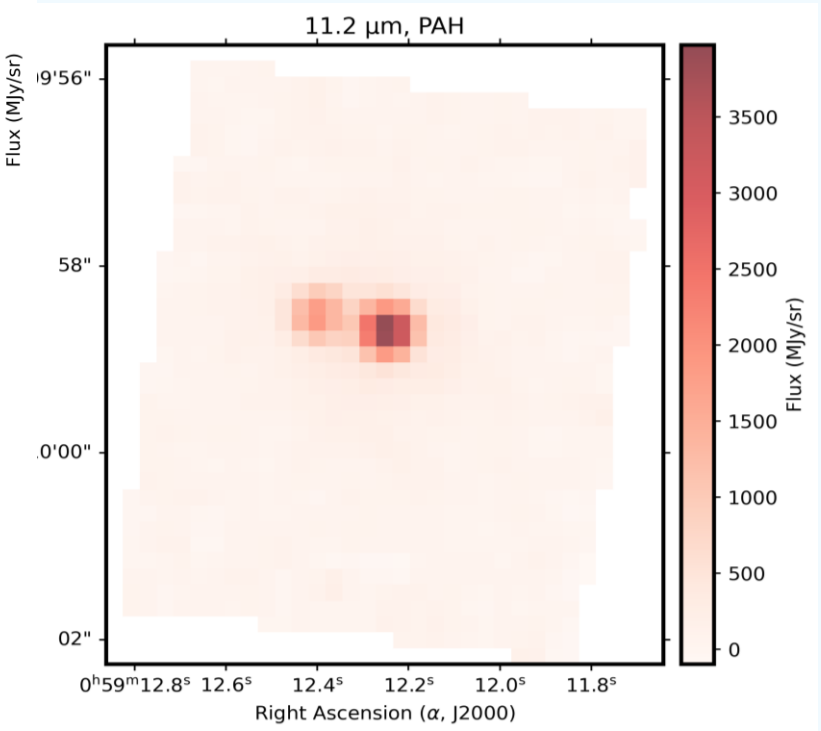
Whelan et al. (2013)

Figure 1. JWST multicolor MIRI image of NGC 346 combining the F770W (blue), F1000W (cyan), F1130W (green), F1500W (yellow), and F2100W (red) filters of NGC 346. The locations of the four MIRI/MRS pointings are marked with red circles. NASA, ESA, CSA, STScI, N. Habel (JPL, Caltech). Image processing: Alyssa Pagan (STScI) and Patrick Kavanagh (Maynooth University).

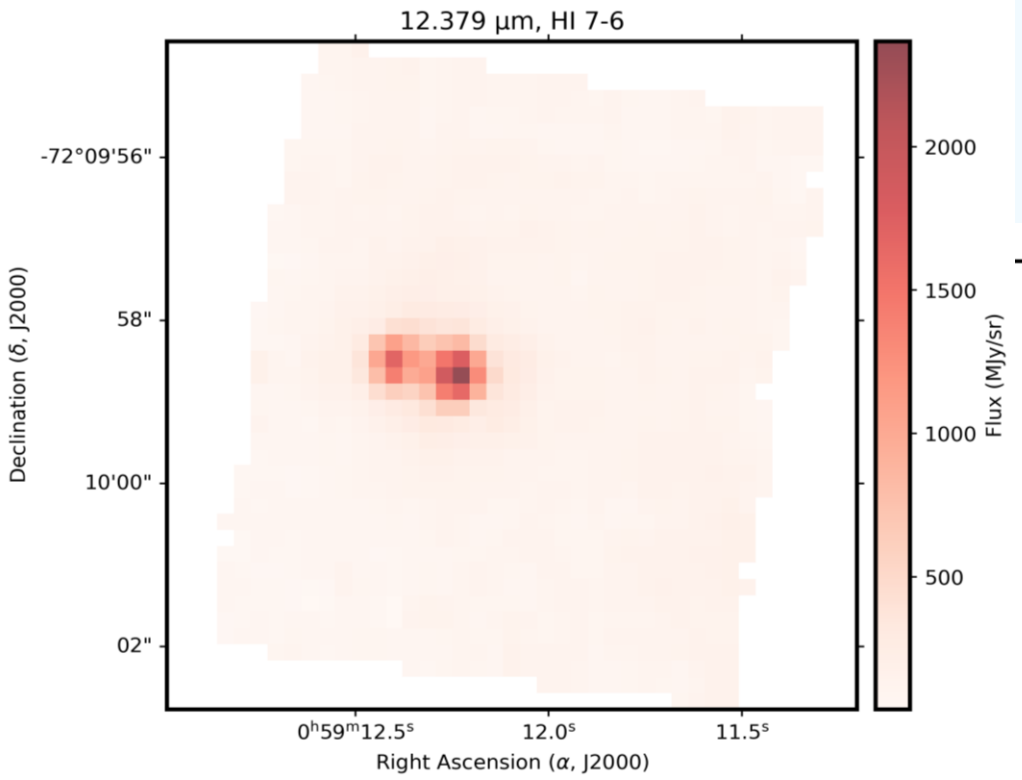
Slices of the IFU spectral cubes



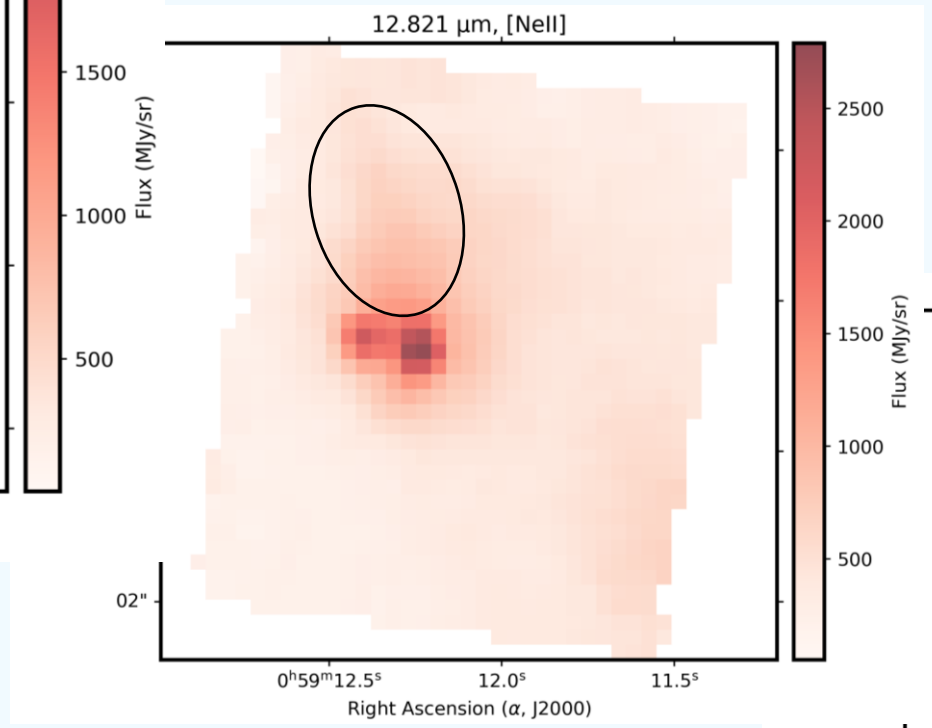


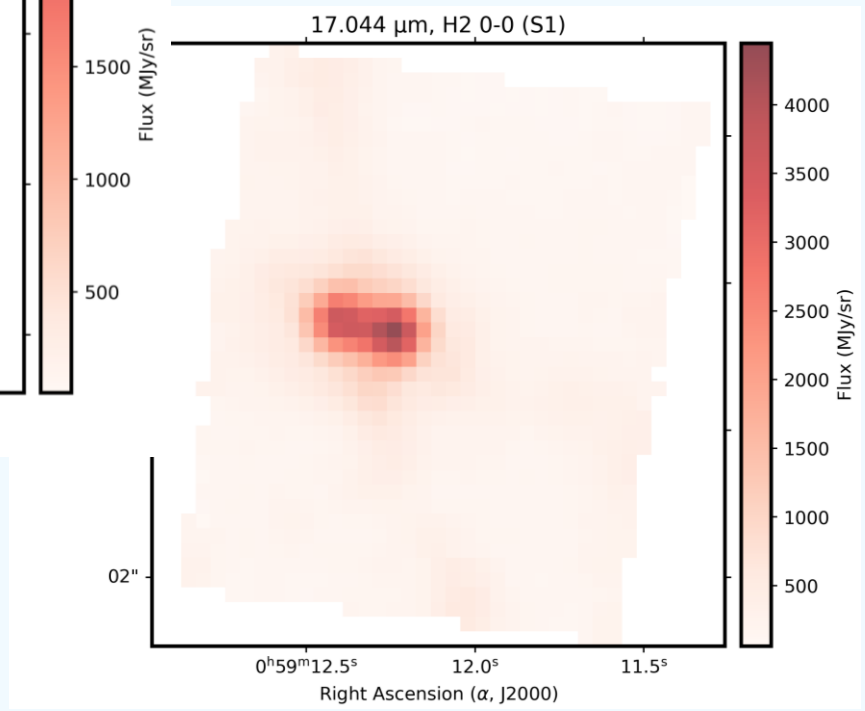


Slices of the IFU spectral cubes



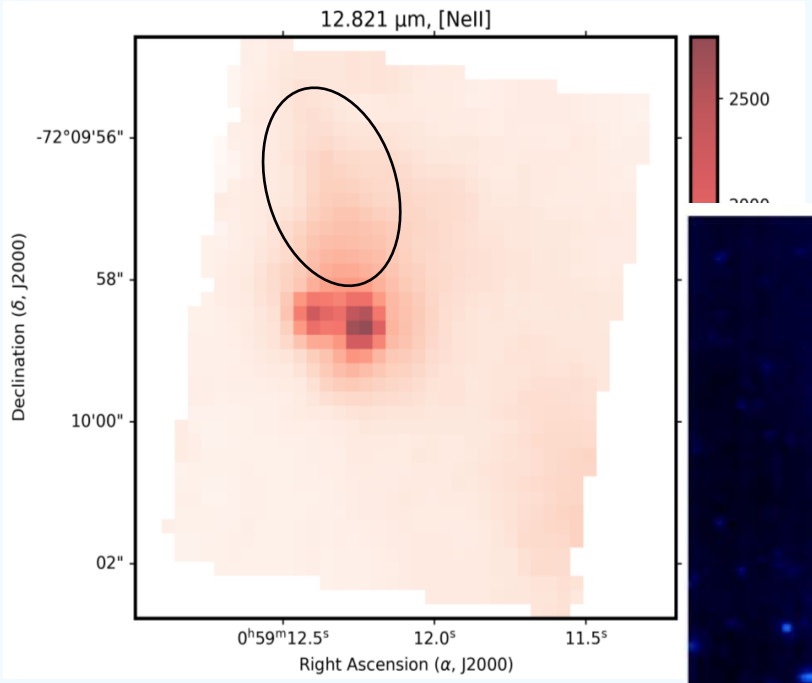
Filamentary structure



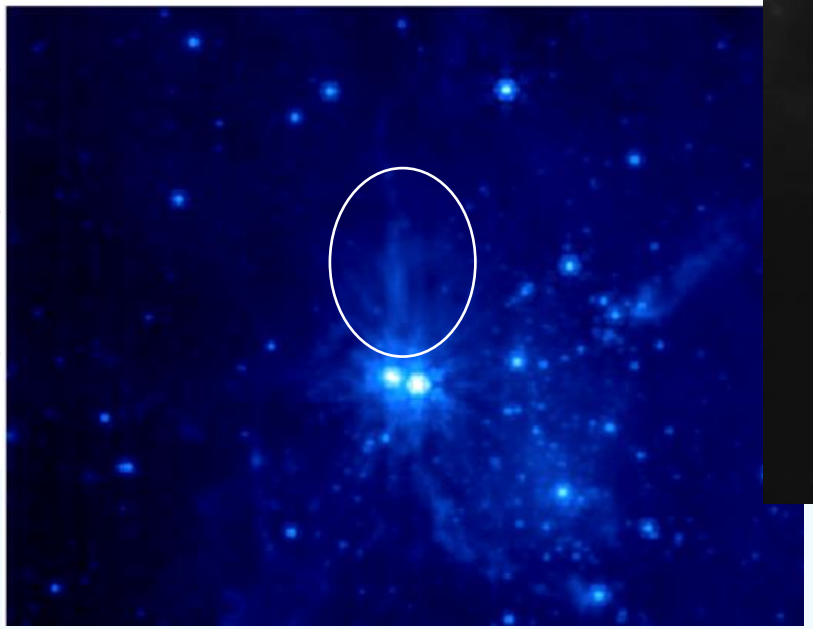


Slices of the IFU spectral cubes

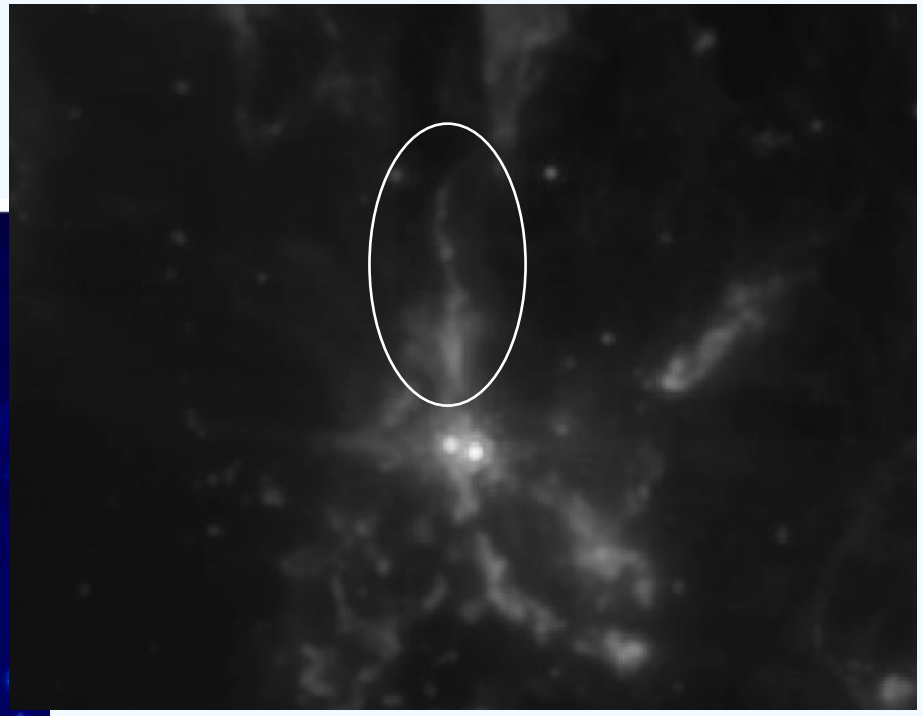
Filamentary structure



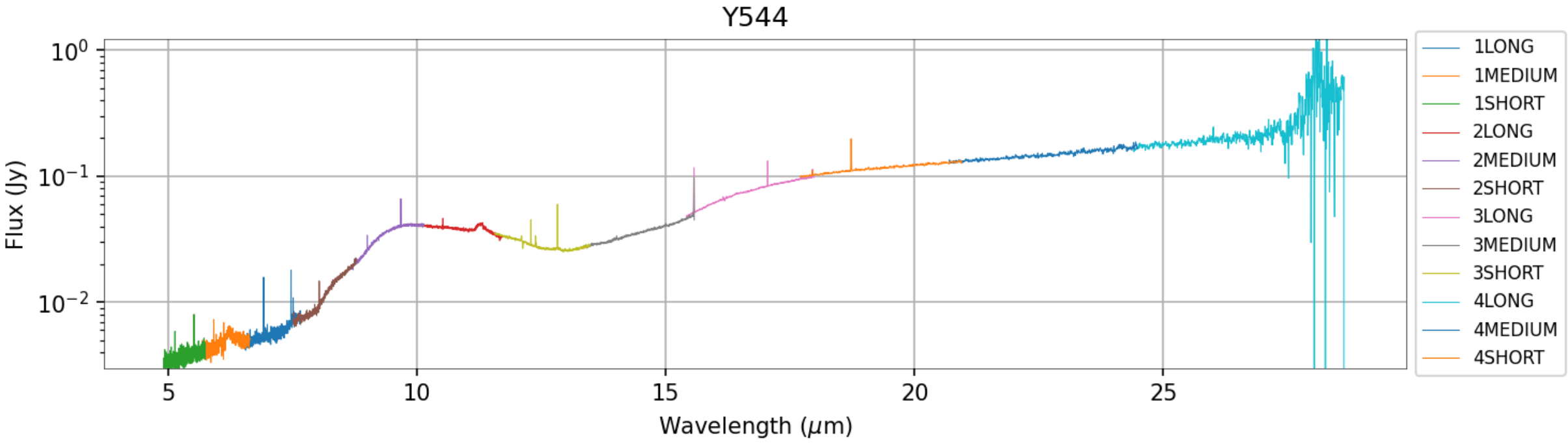
NIRCAM F444W



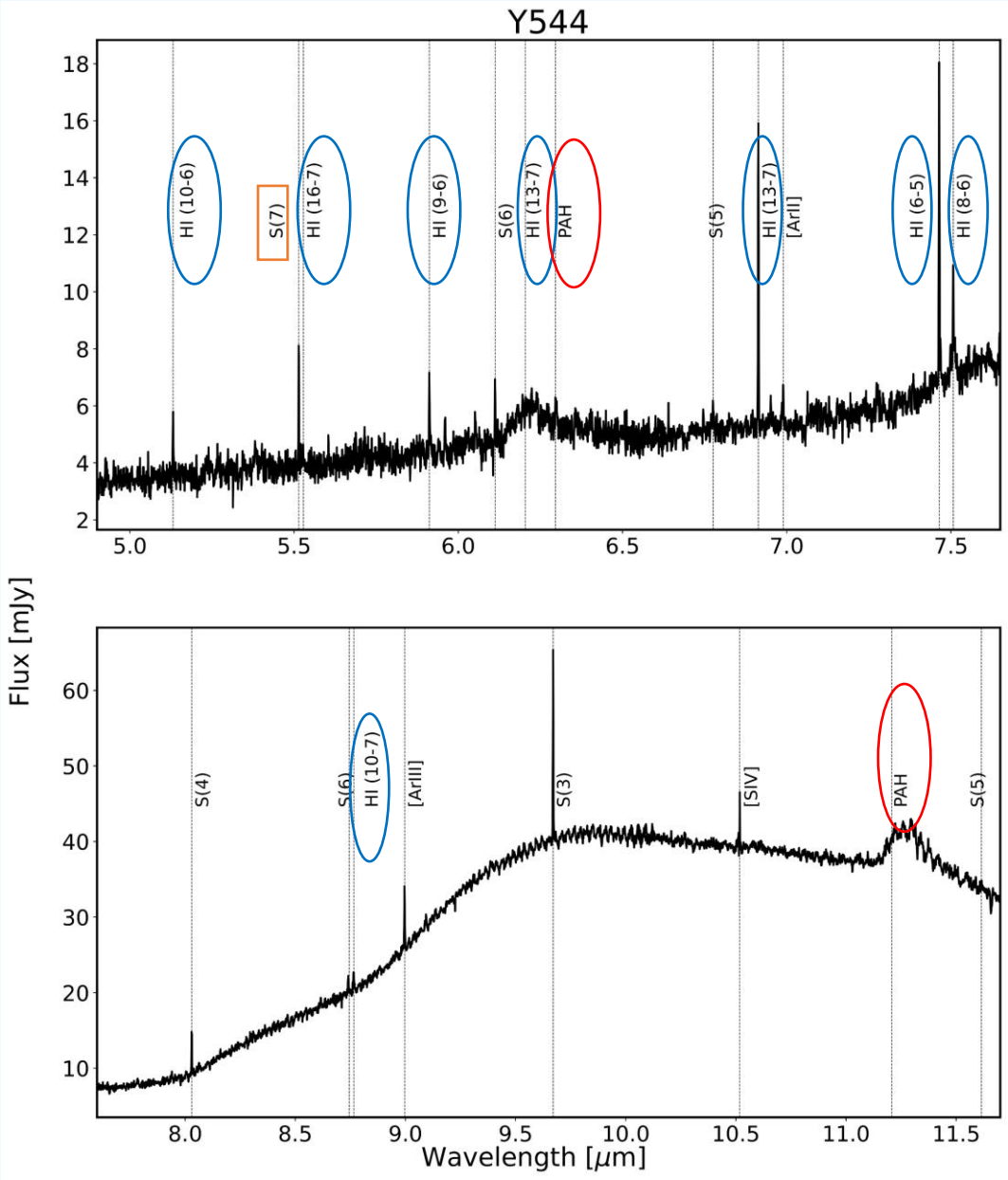
MIRI F770W



MIRI Spectrum



Emission Lines

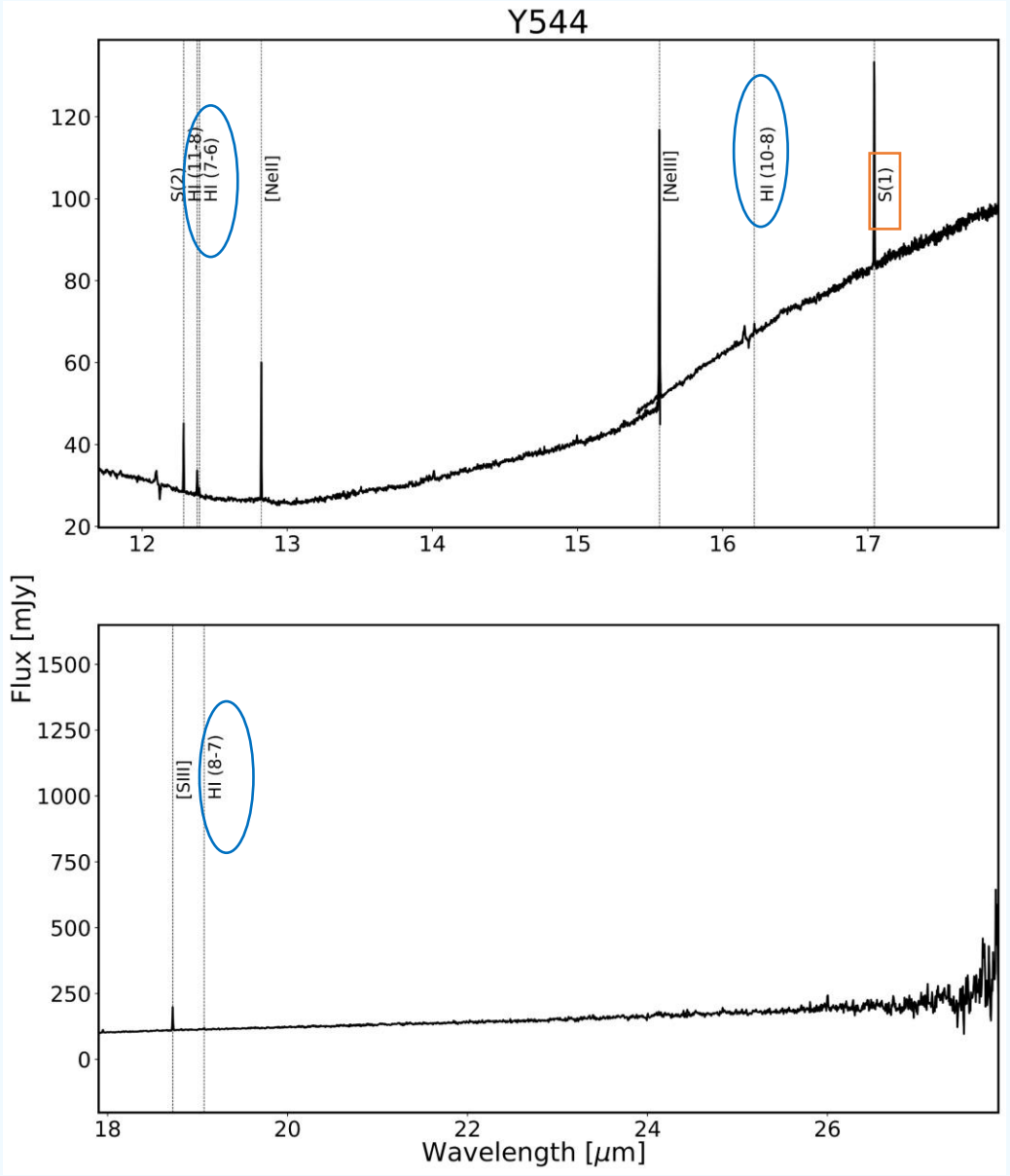


Small grains

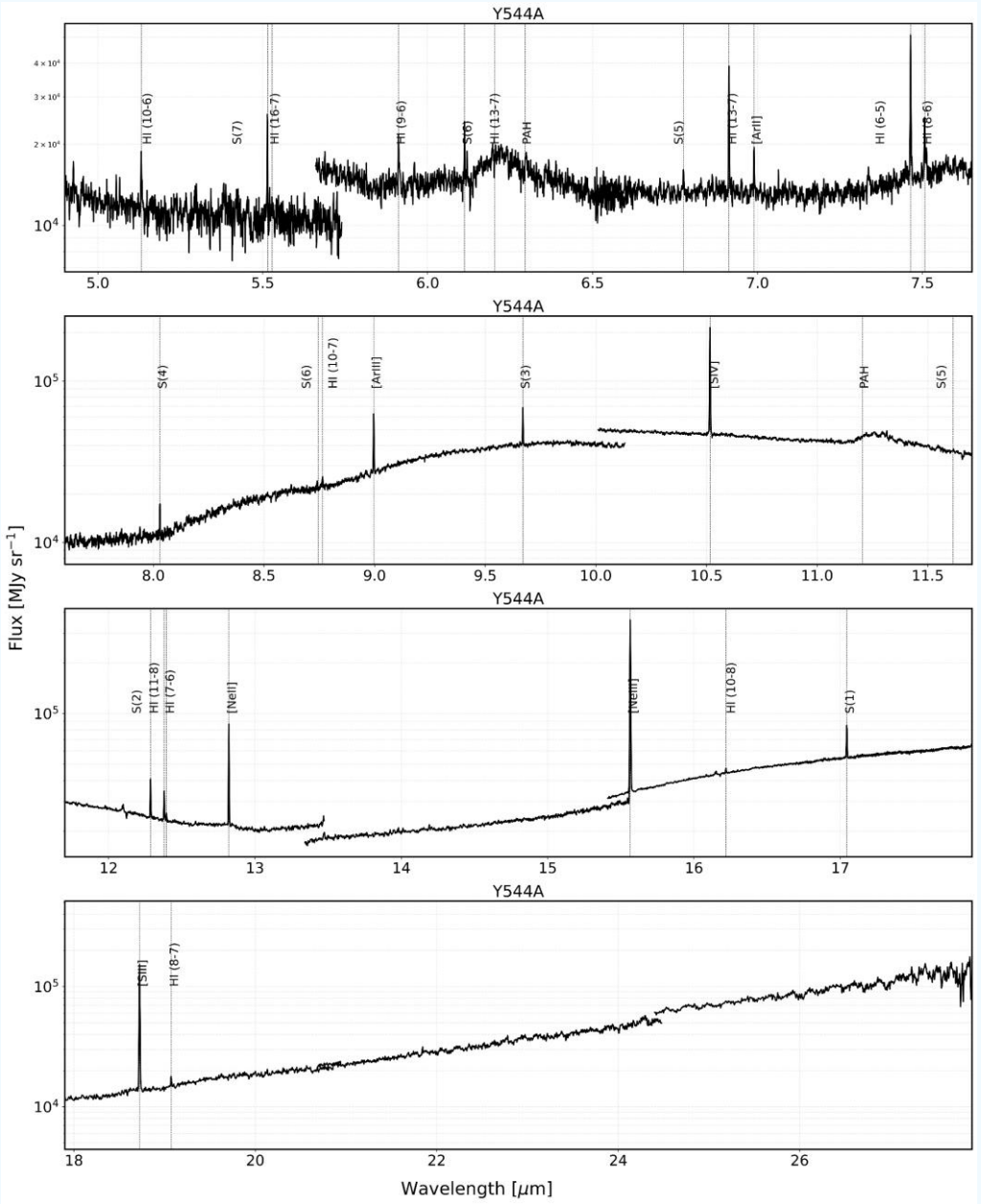
Ongoing accretion

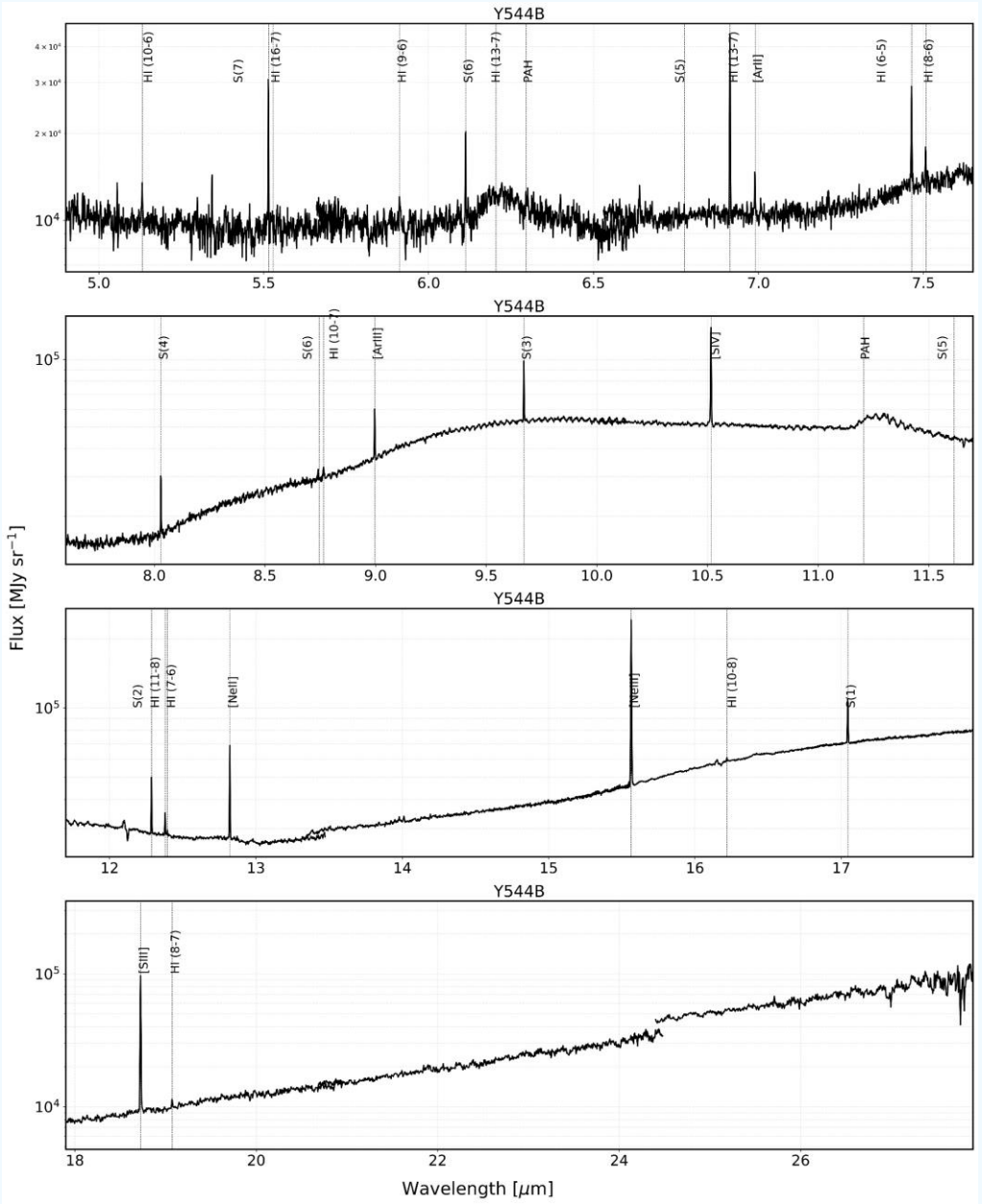
Line ratio =S1/S7 >1 → Young and embedded in cool envelopes

High velocity shock

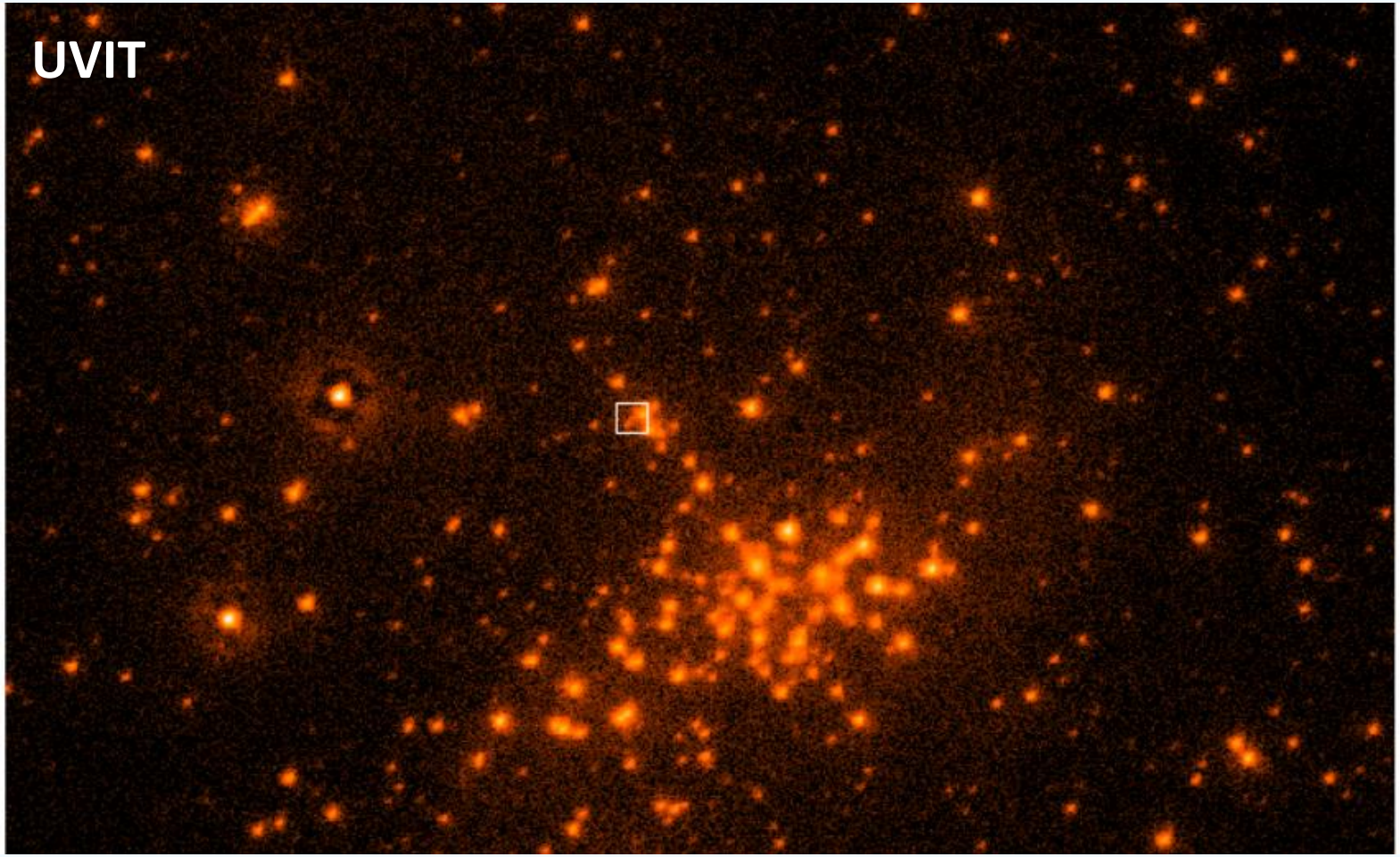


Y544A and Y544B





Future



Thank You