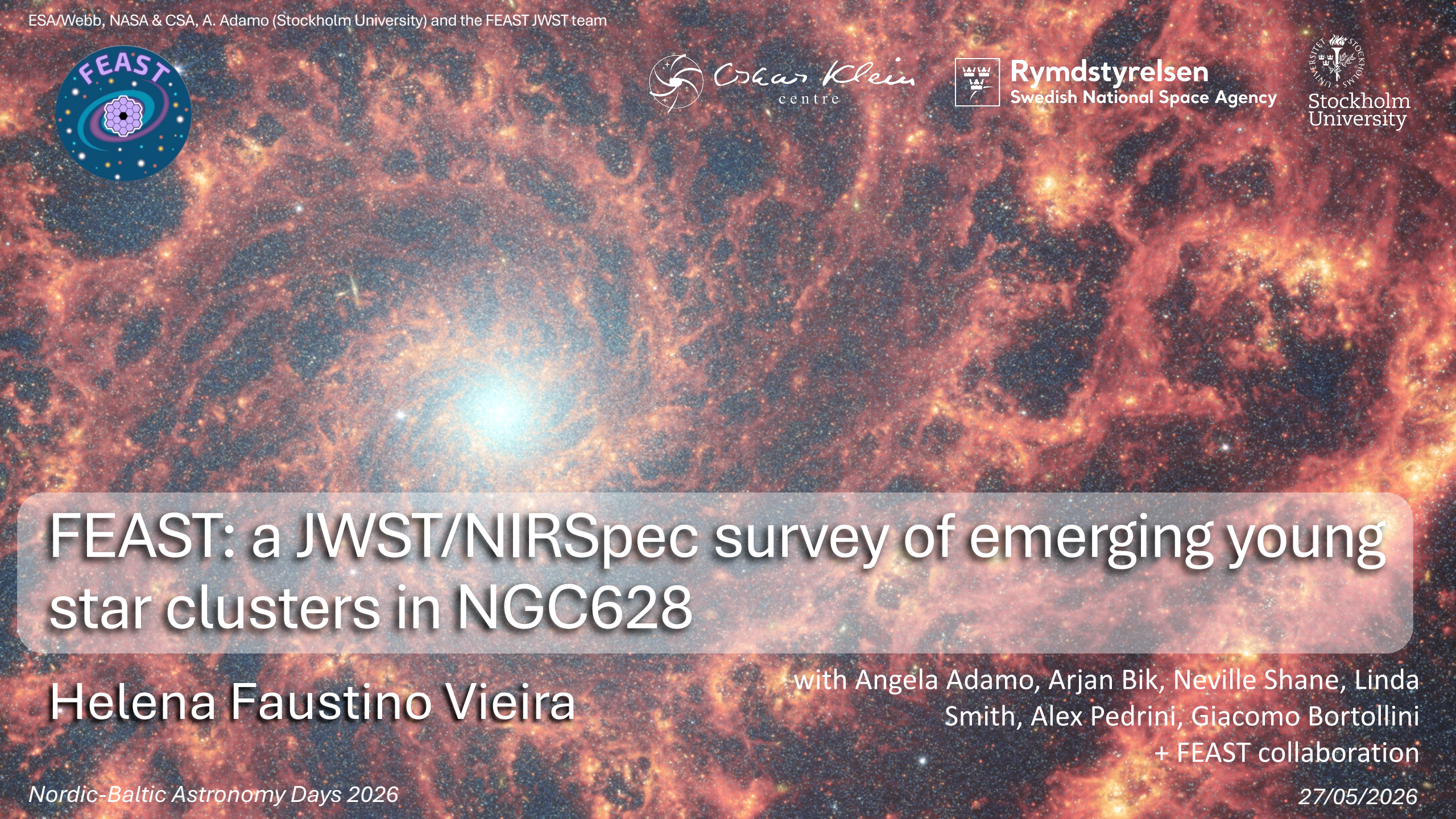


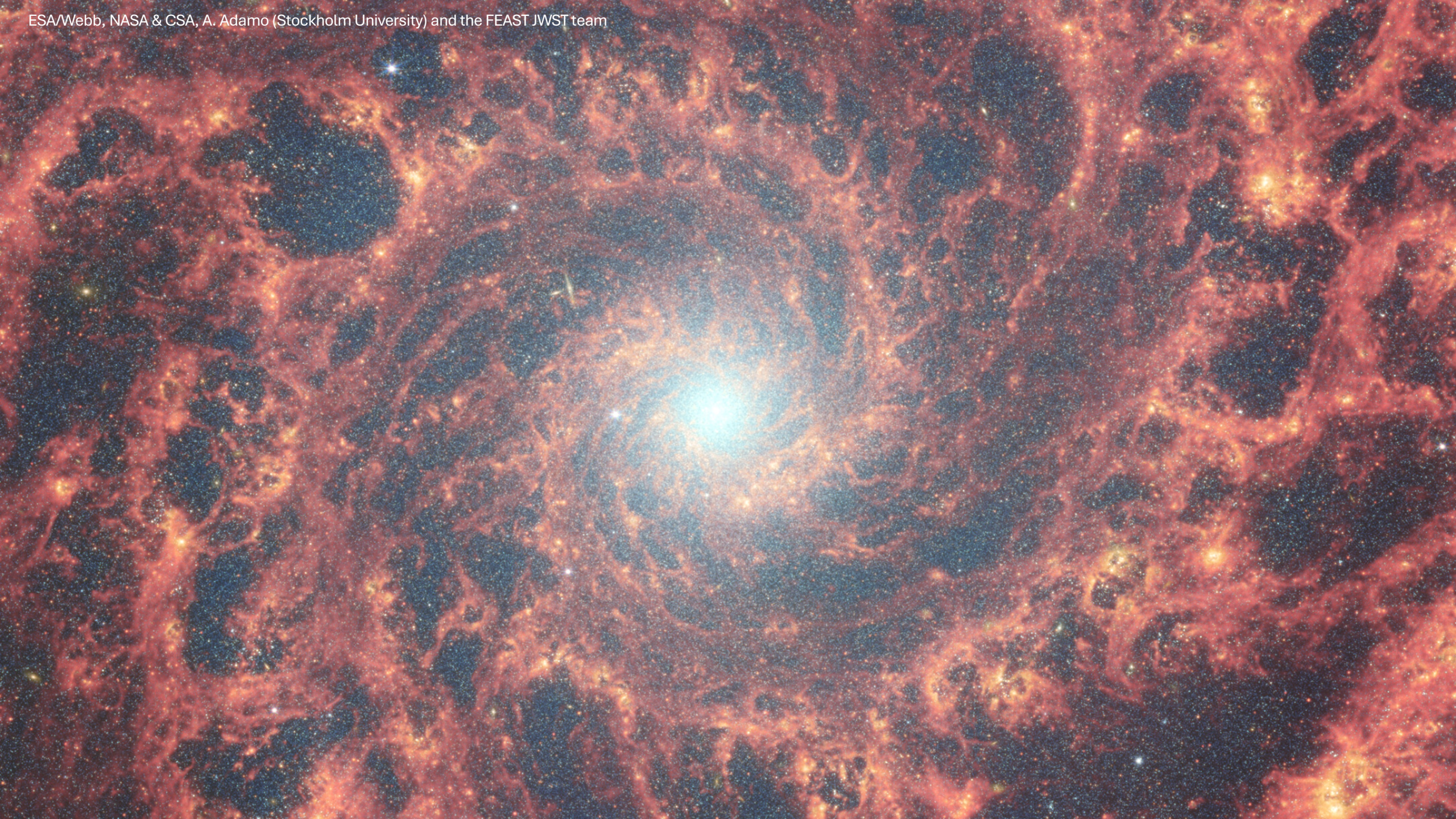
FEAST: a JWST/NIRSpec survey of emerging young star clusters in NGC628

Helena Faustino Vieira

with Angela Adamo, Arjan Bik, Neville Shane, Linda Smith, Alex Pedrini, Giacomo Bortollini + FEAST collaboration

Nordic-Baltic Astronomy Days 2026

27/05/2026


ESA/Webb, NASA & CSA, A. Adamo (Stockholm University) and the FEAST JWST team

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Star formation

NGC3603: NASA, ESA and the Hubble Heritage (STScI/AURA)-ESA/Hubble Collaboration

ESA/Webb, NASA & CSA, A. Adamo (Stockholm University) and the FEAST JWST team

Stellar feedback

- Stellar winds
- Radiation
- Supernova

Star formation

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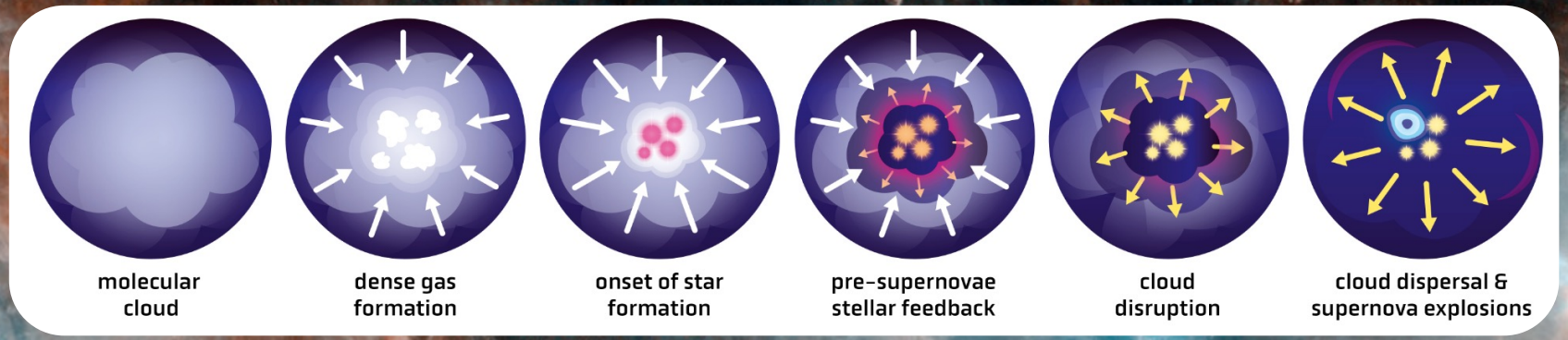
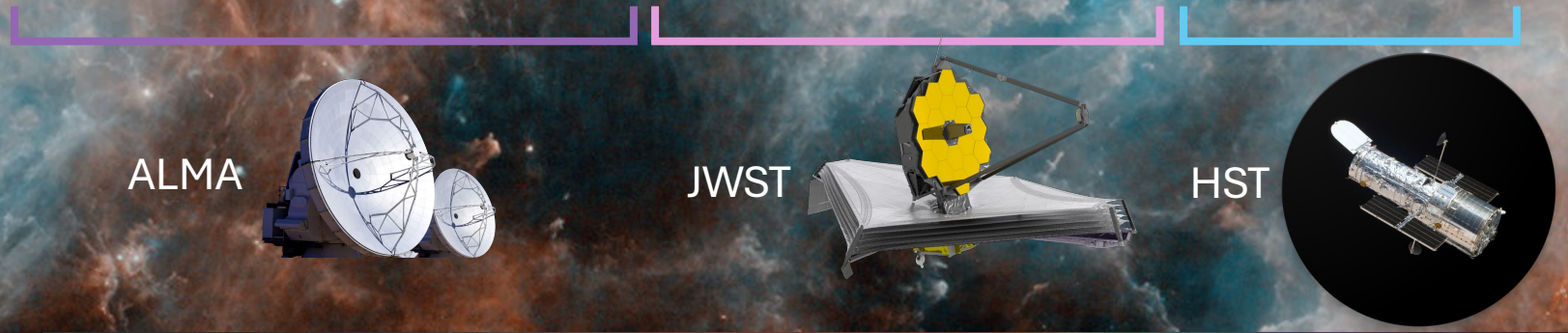
H. Faustino Vieira

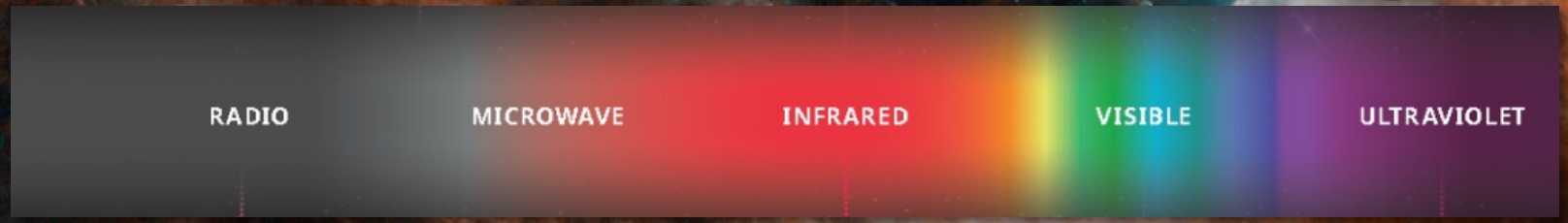
W3/W4/W5 complex: ESA/Herschel/NASA/JPL-Caltech, CC BY-SA 3.0 IGO; Acknowledgement: R. Hurt (JPL-Caltech)

Different wavelengths trace different stages in the star formation process



from Schinnerer&Leroy 2024





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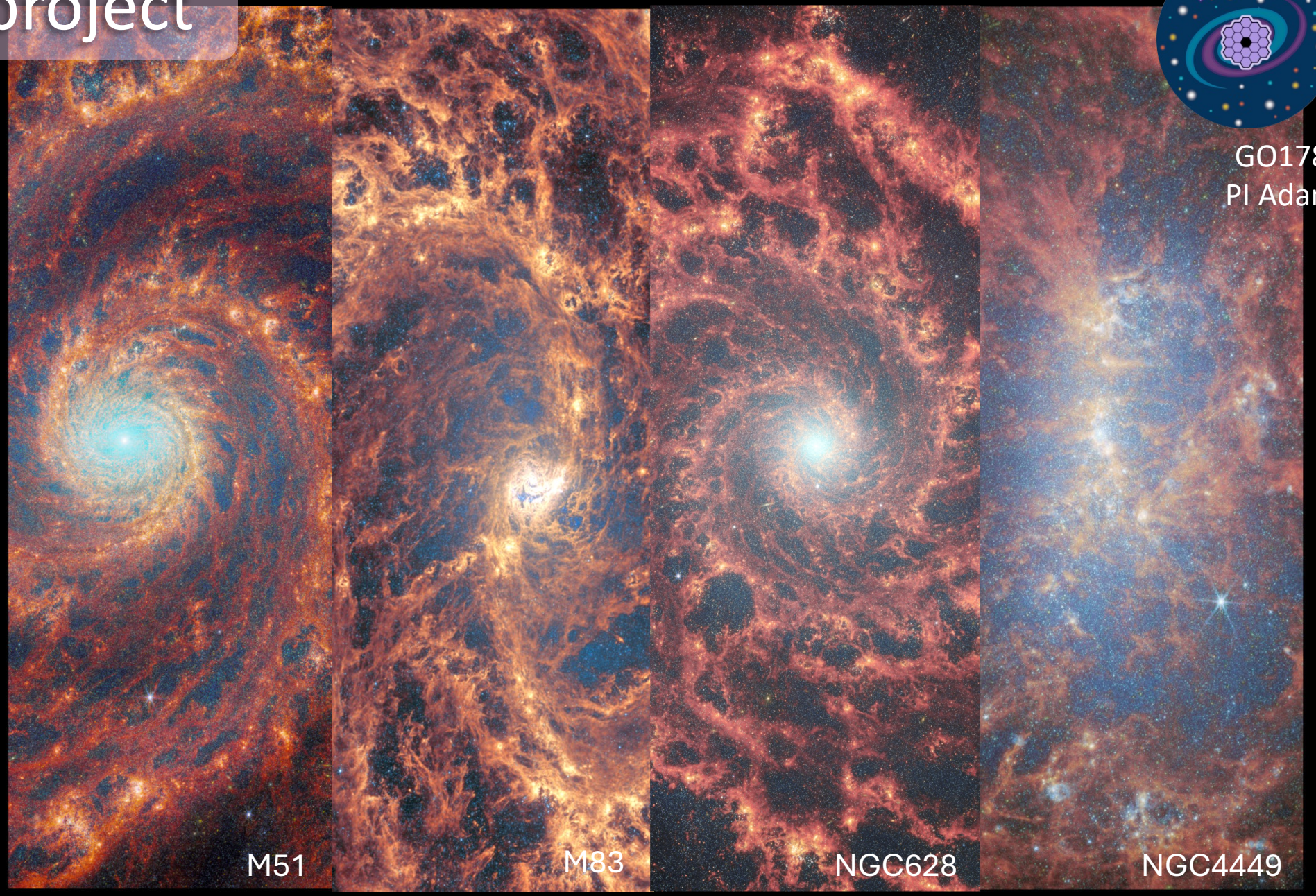
The FEAST project

Feedback in Emerging extragAlactic Star clusTers

feast-survey.github.io

GO1783
PI Adamo



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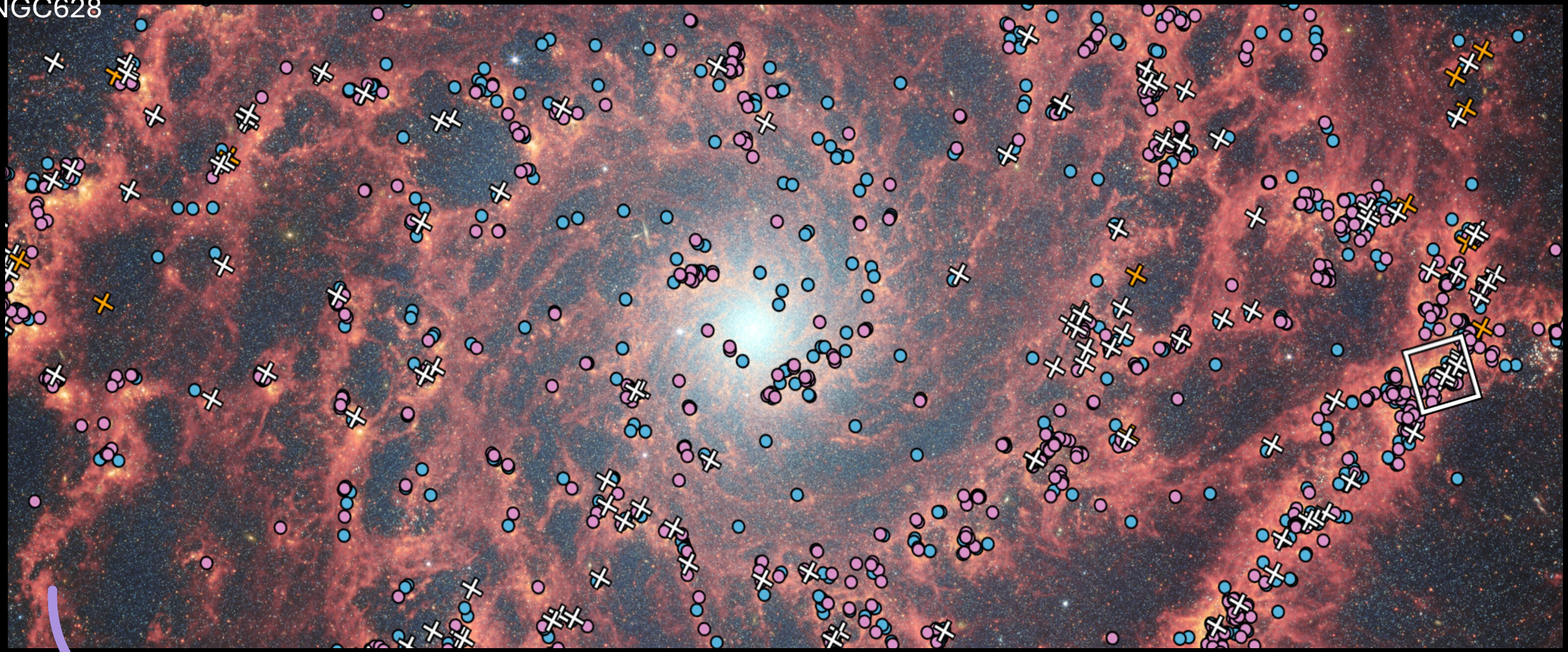
NGC628

Faustino Vieira+2026



Emerging young star clusters (eYSCs) – compact peaks of Paα and/or 3.3μm PAH

Not visible in the optical yet: eYSCs are still emerging/clearing their natal molecular cloud, and thus actively driving stellar feedback (Pedrini+2024,2025; Knutas+2025, Adamo+in prep)

NGC628

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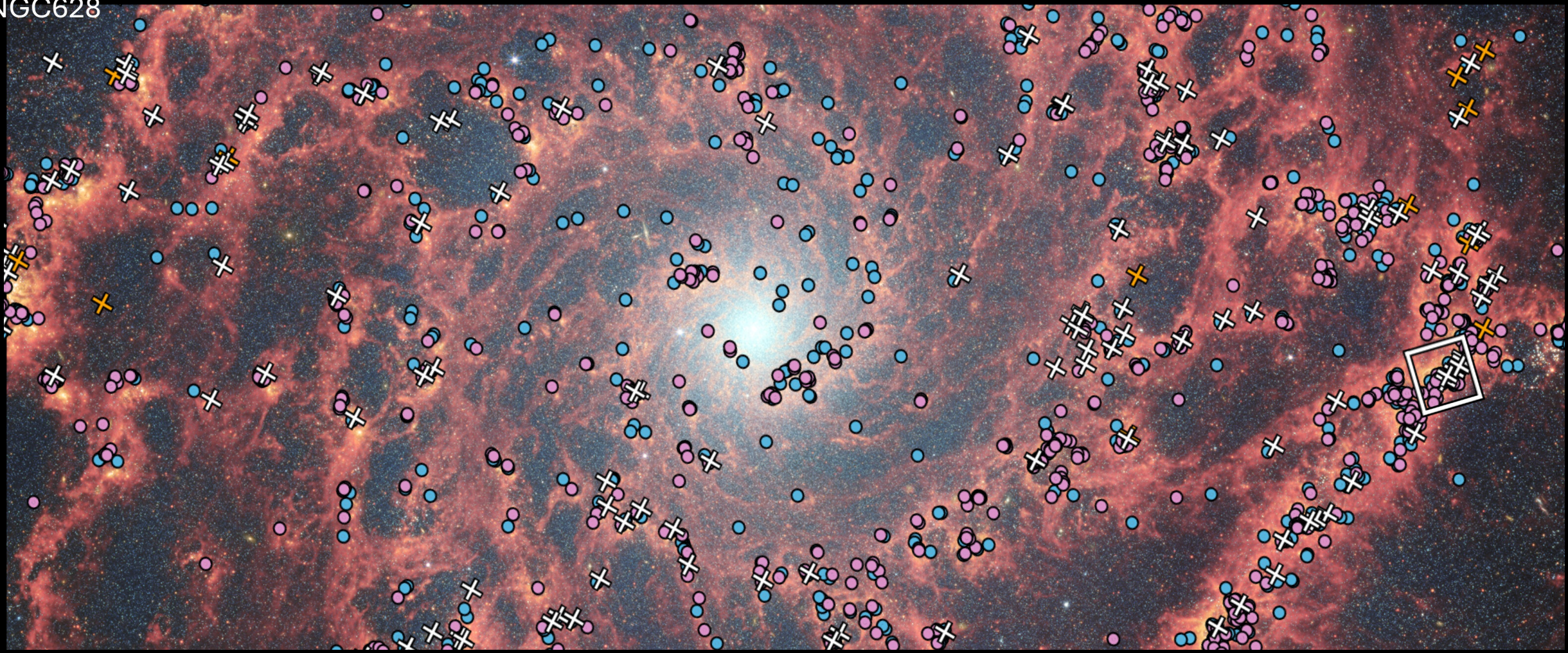

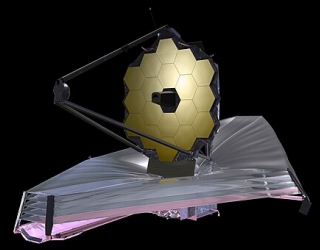

Observed with NIRSpec/MOS (GO3503)
– spectroscopy in the $1 - 5\mu$m range

NGC628

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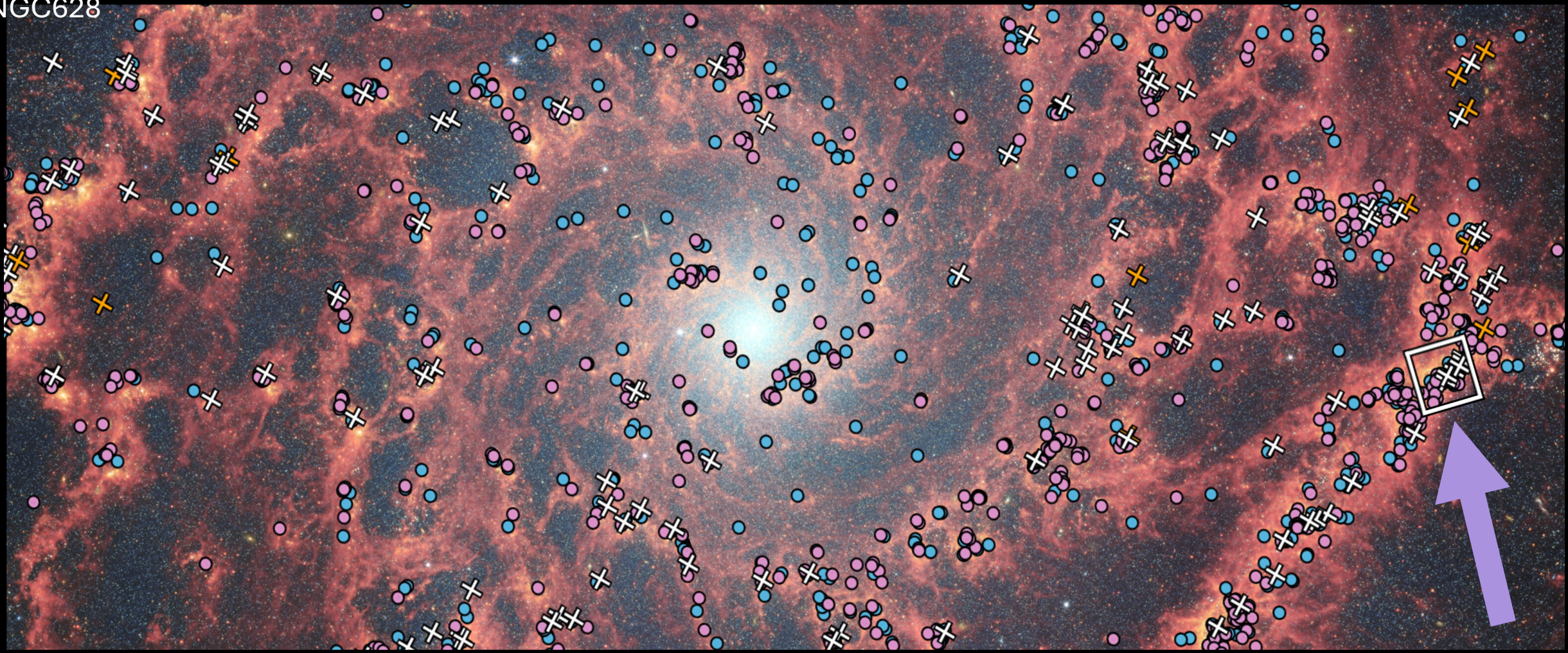

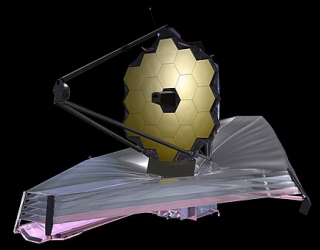

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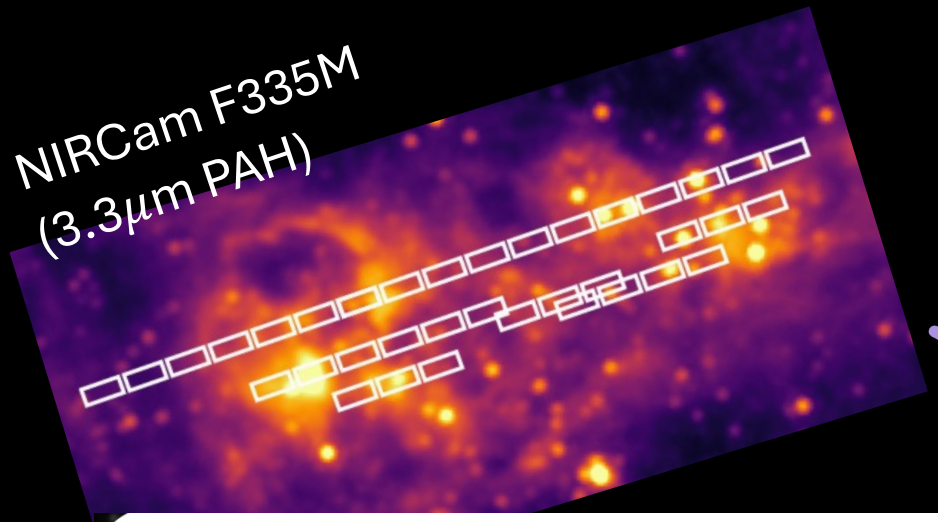

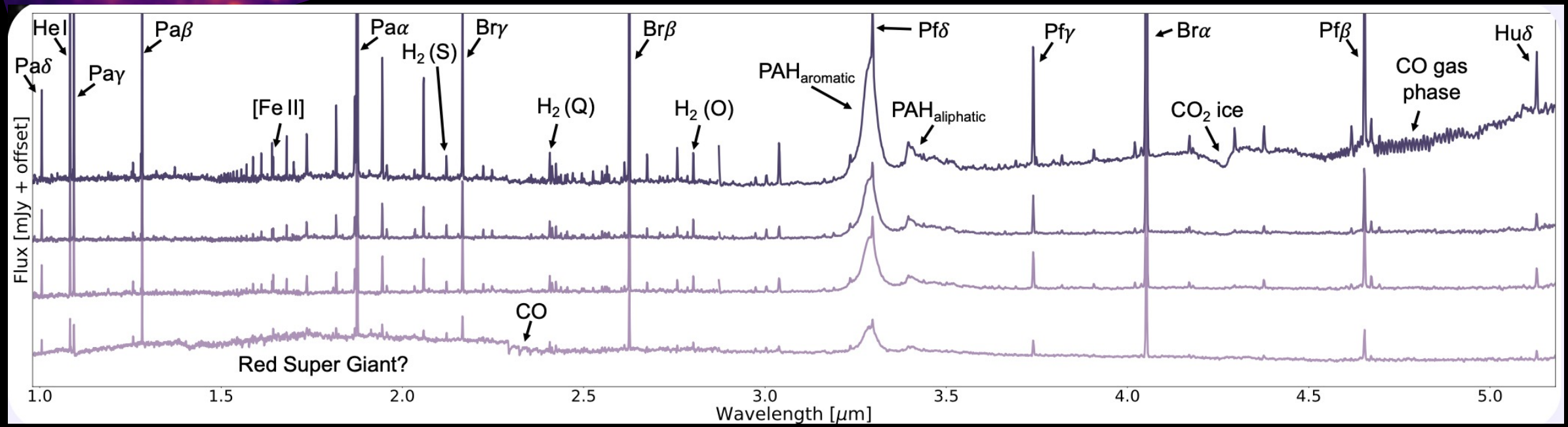

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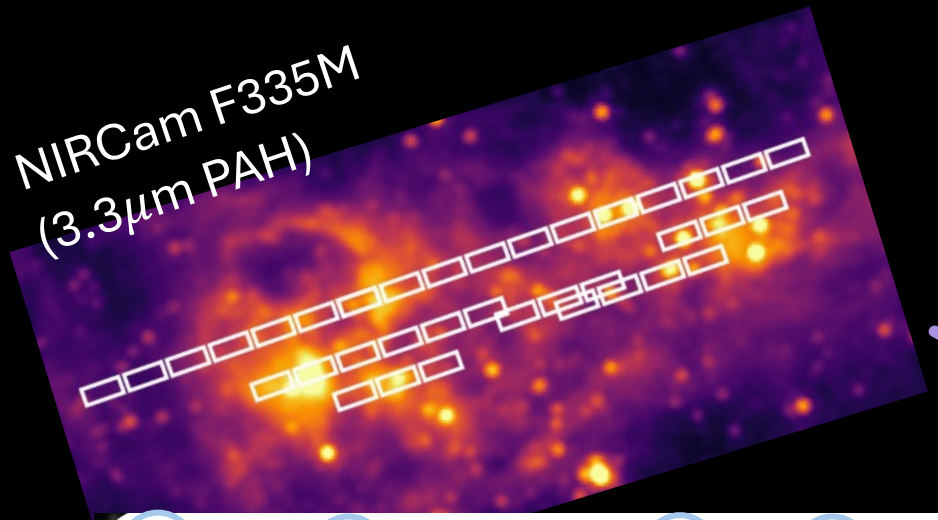
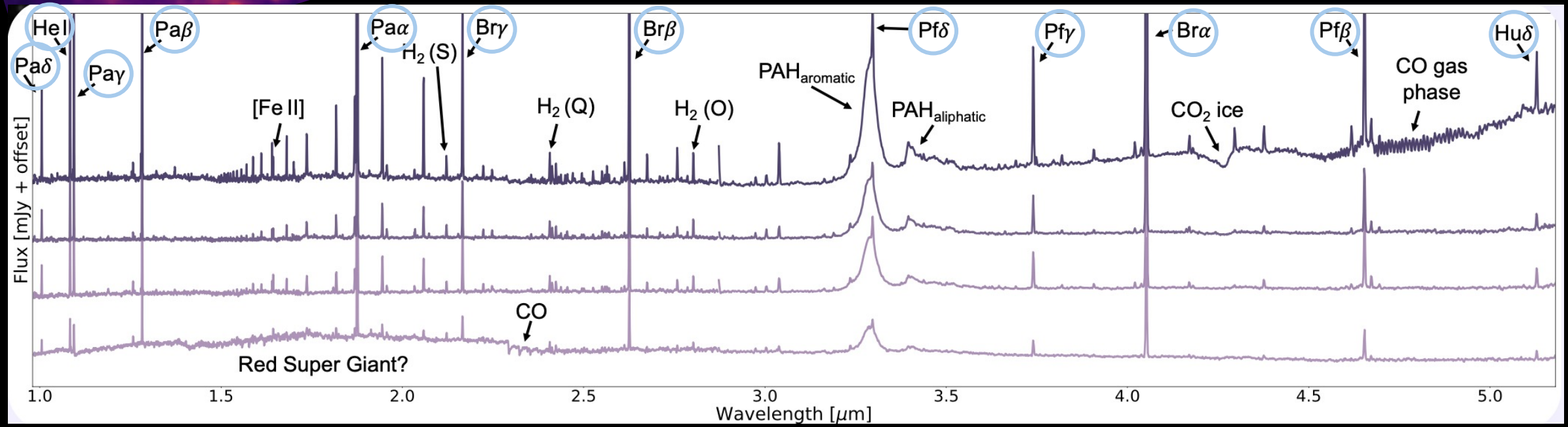
Ionization – multiple H and He lines





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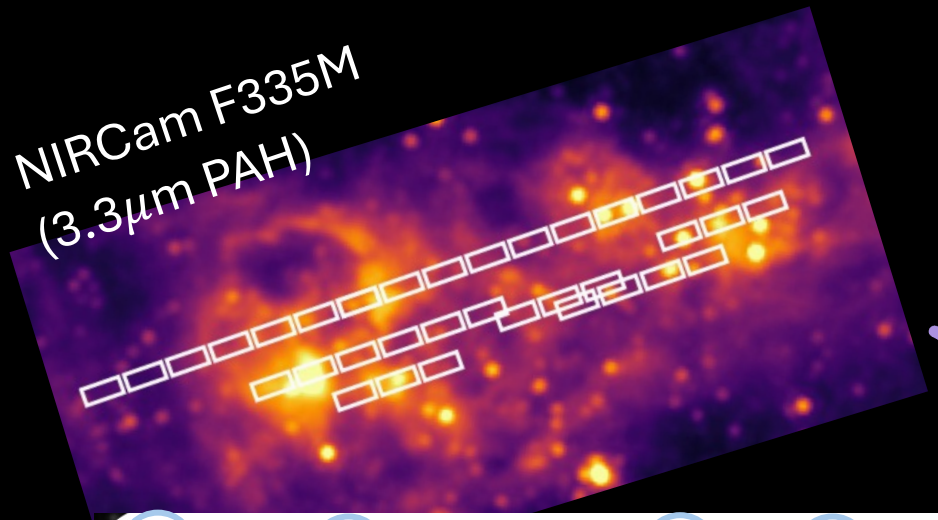

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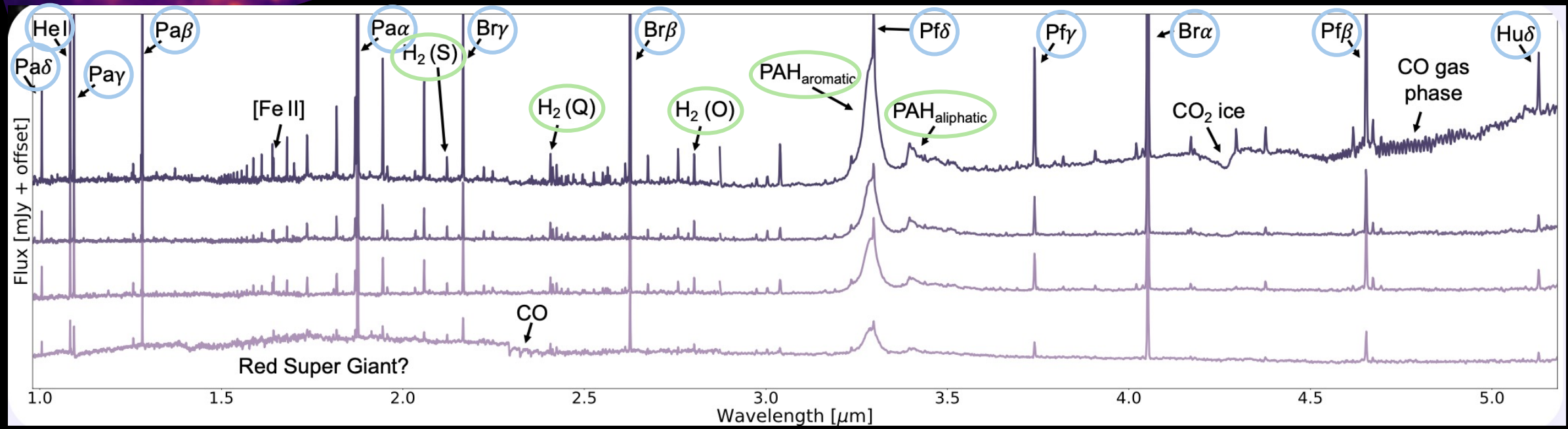
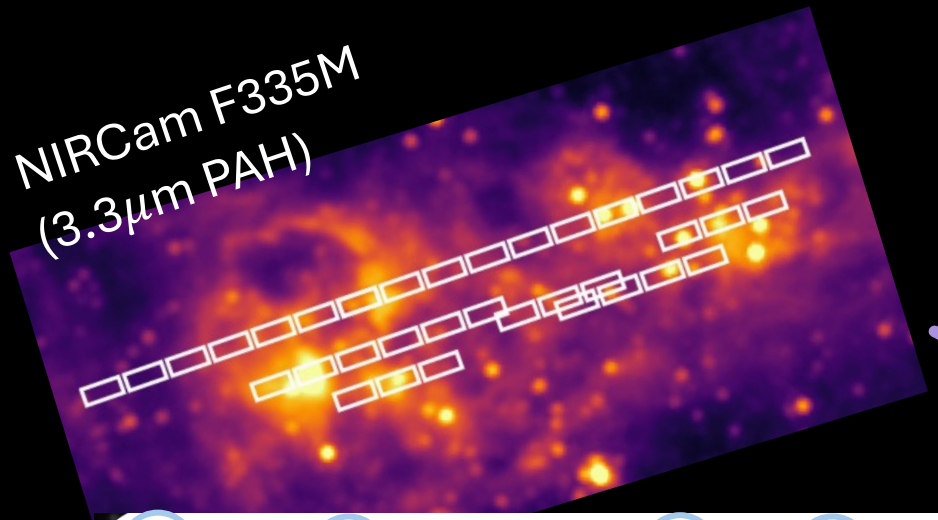
Gas/Dust – forest of H_2 lines; 3.3μm PAH emission



Faustino Vieira+2026



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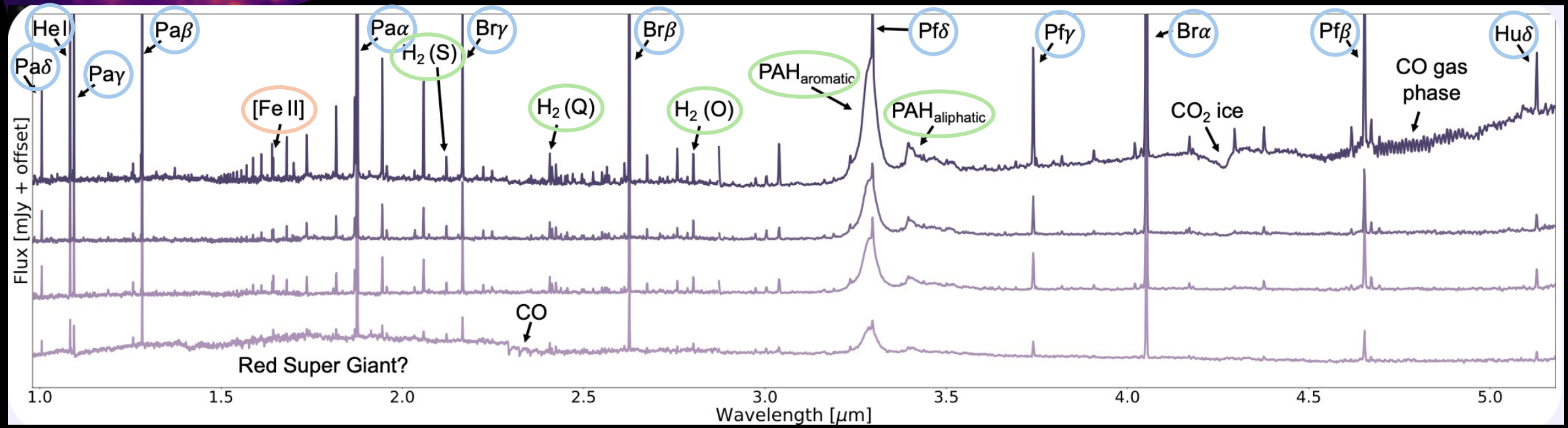

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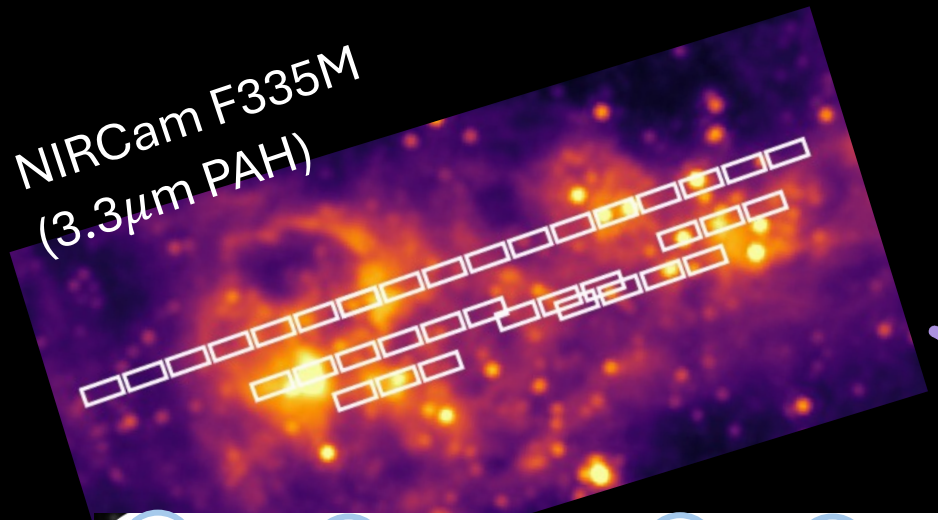

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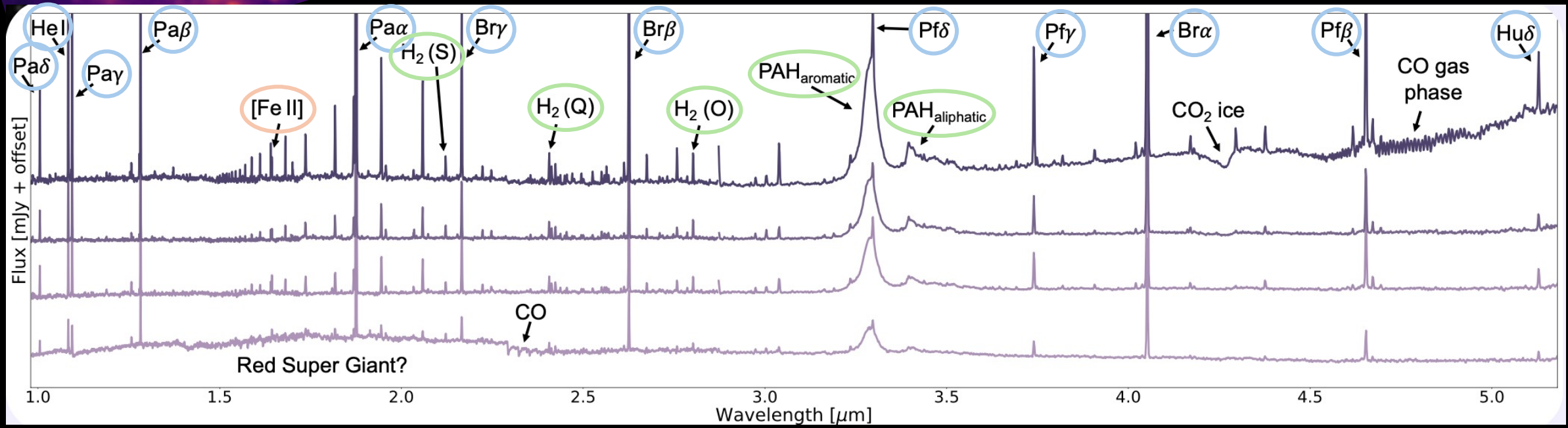
and other interesting features: gas-phase CO, ices, etc



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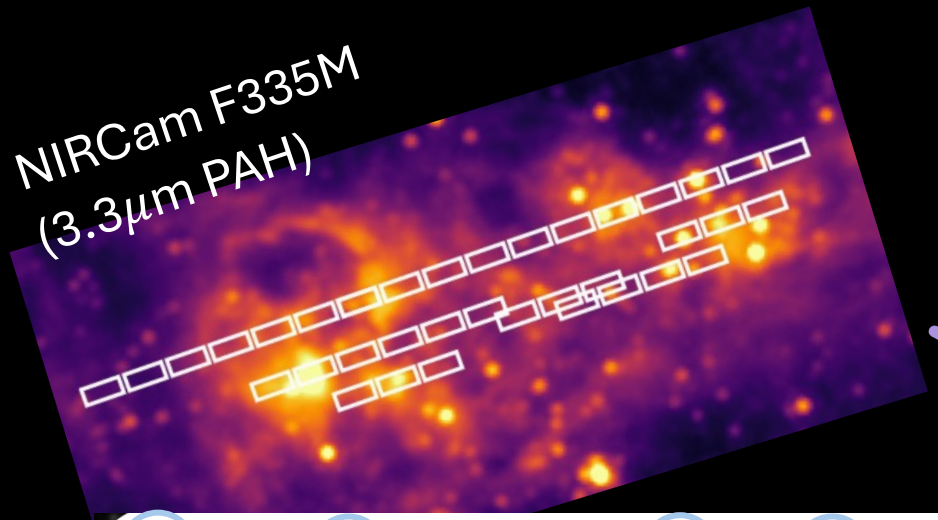

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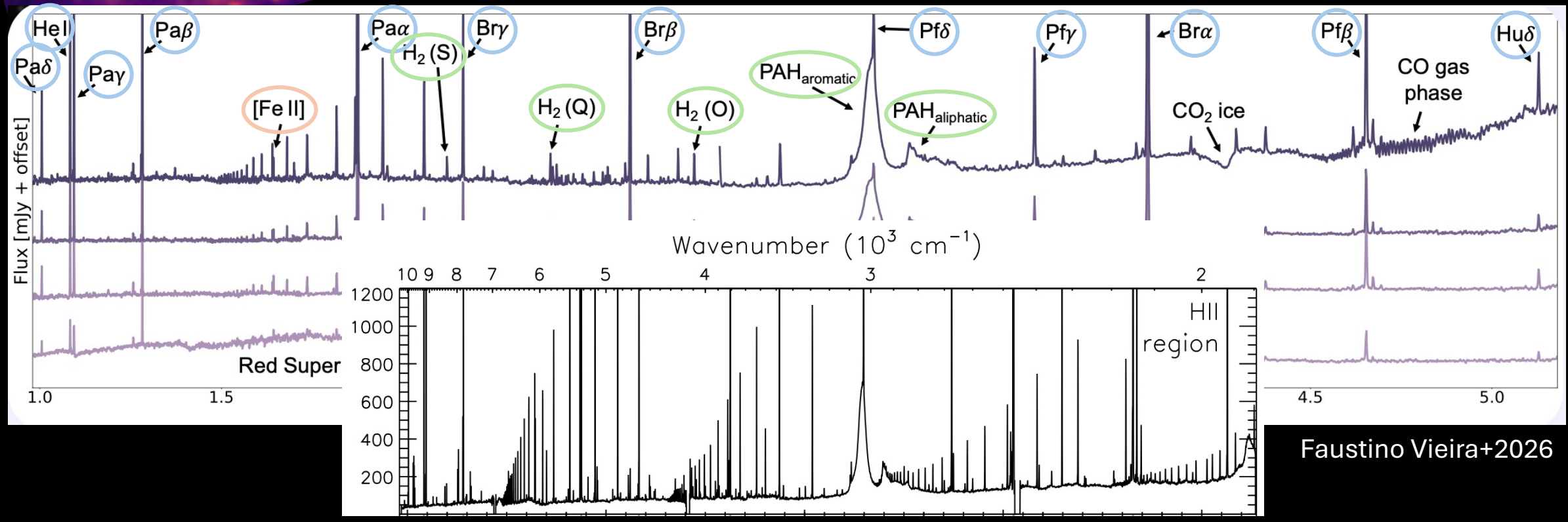

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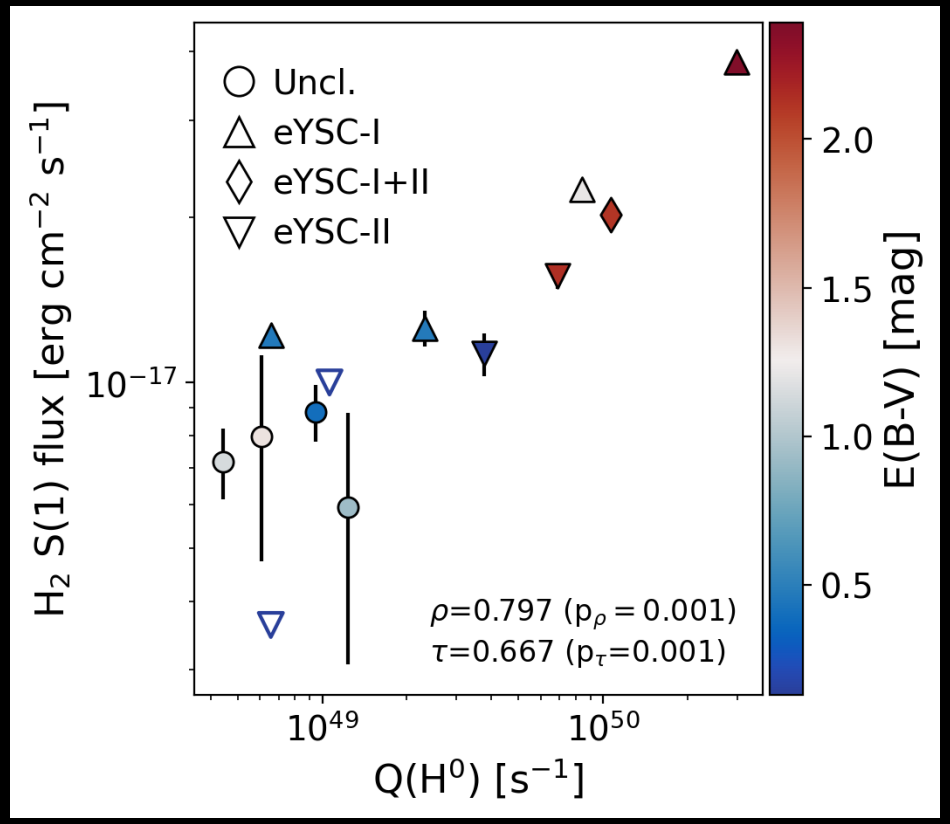
Spectra of an HII region in the Orion Bar from Peeters+2024

Probing the photodissociation regions



Older ← → Younger

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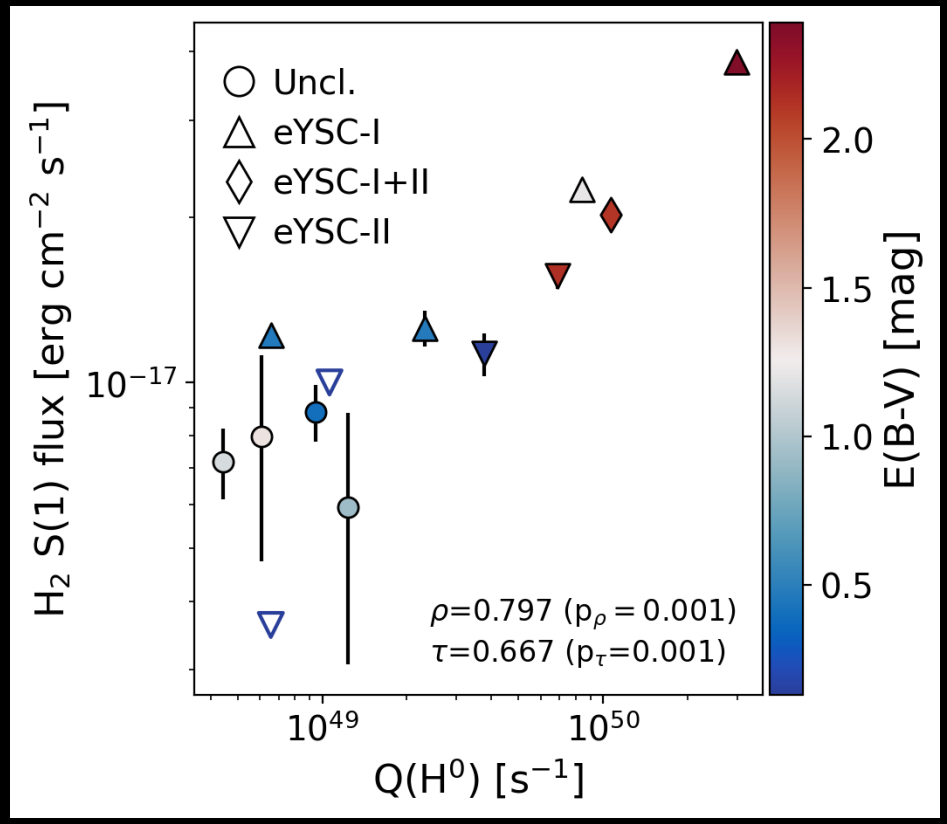

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As clusters evolve and emerge from their cloud, the PDR also evolves

Faustino Vieira+2026

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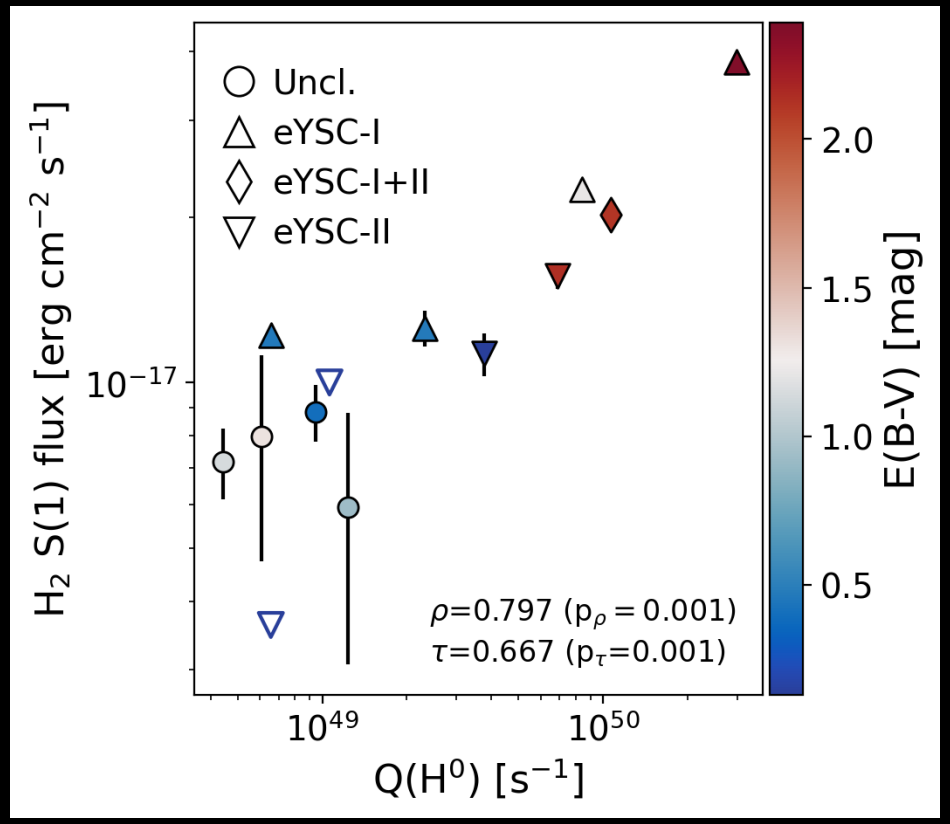

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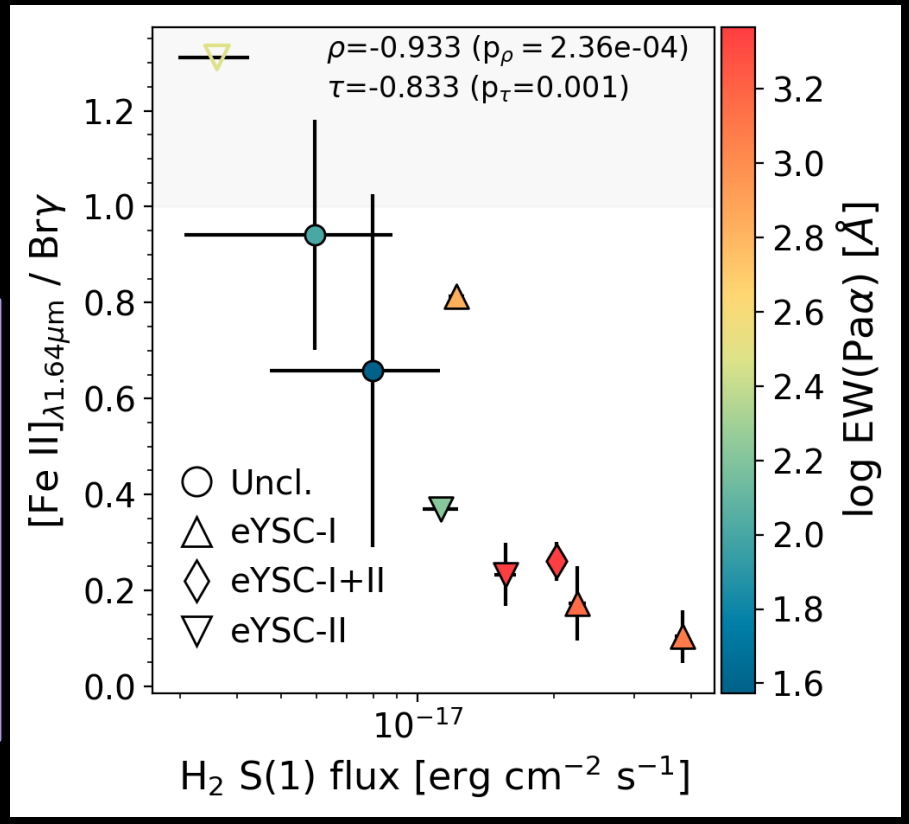
As clusters evolve and emerge from their cloud, the PDR also evolves

Shocks

Photoionization

Diagnosing the stellar feedback



Faustino Vieira+2026

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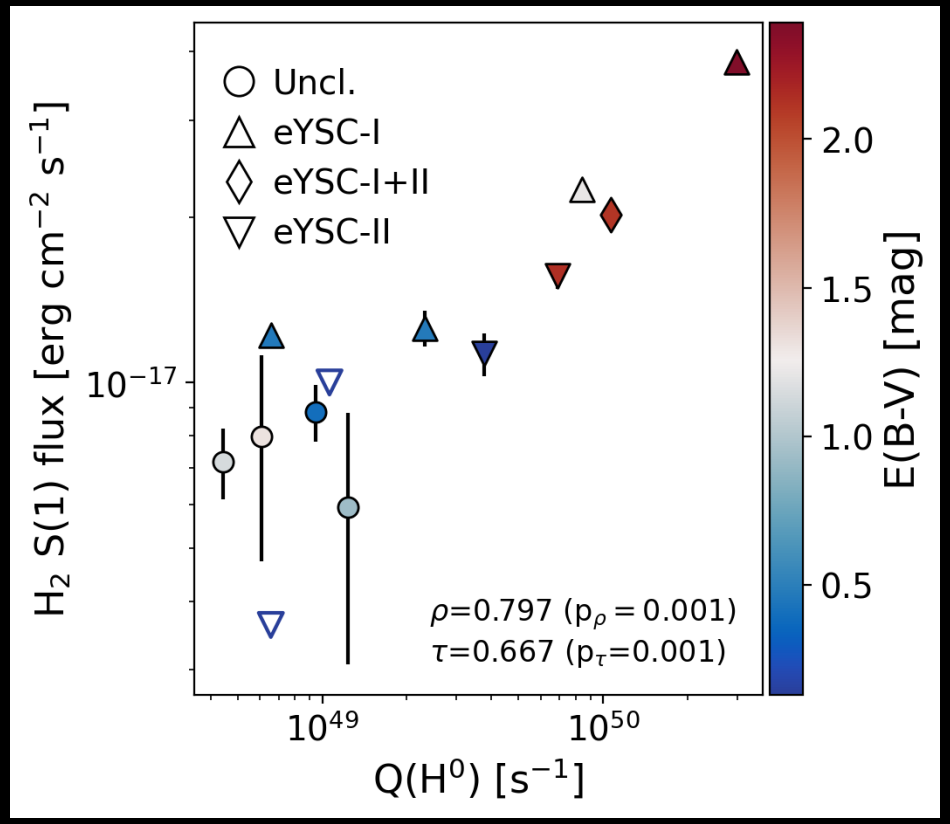

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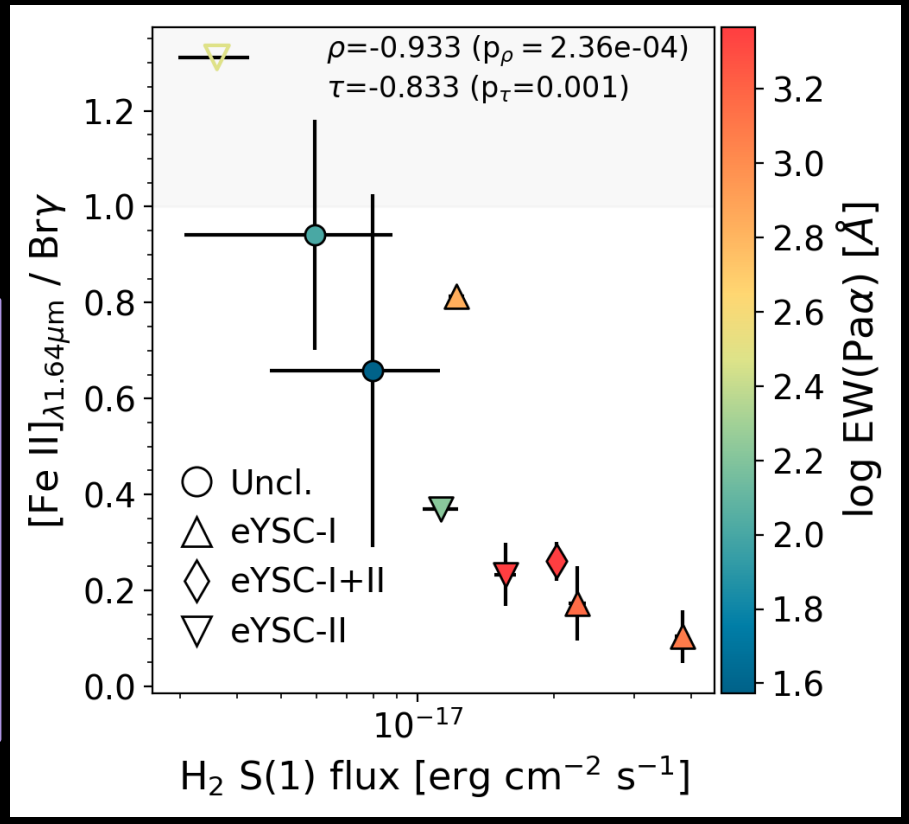
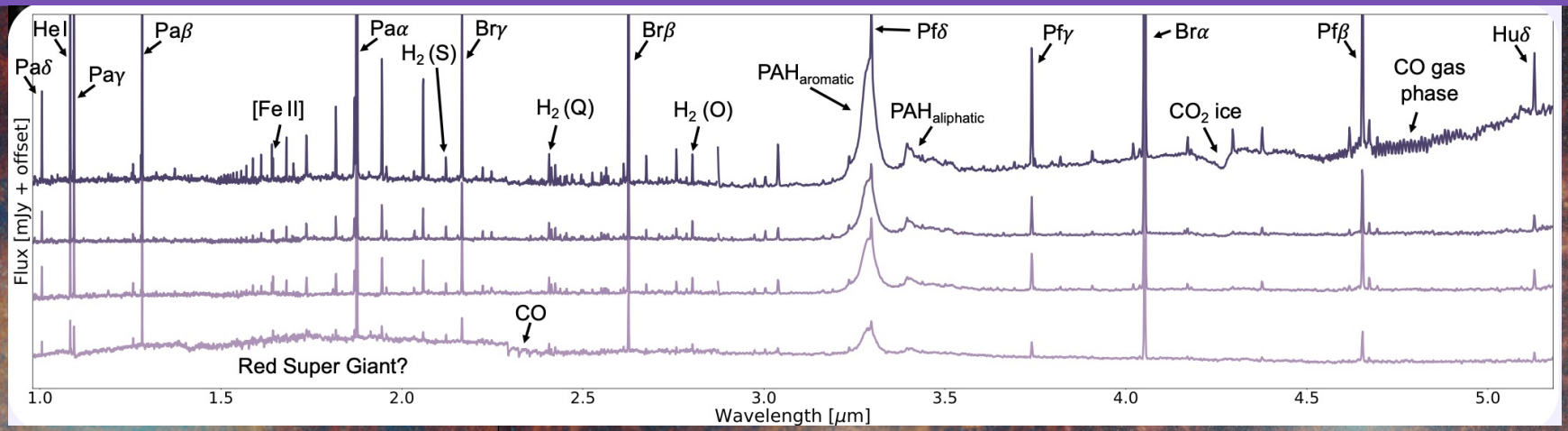
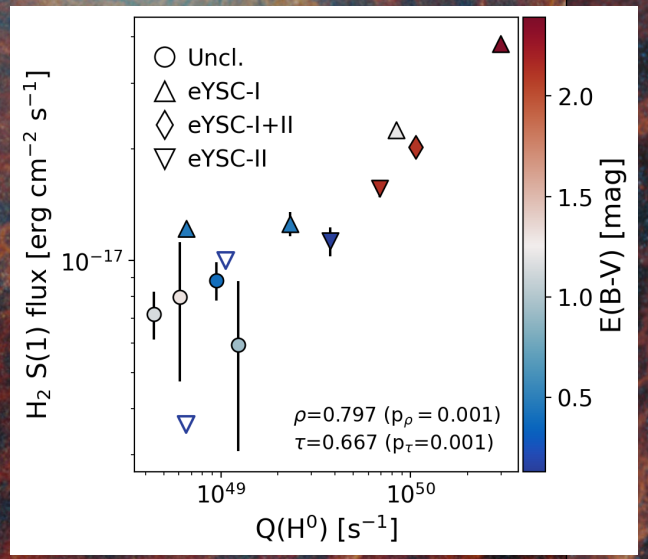


Photoionization is likely the dominant stellar feedback mechanism for these eYSCs

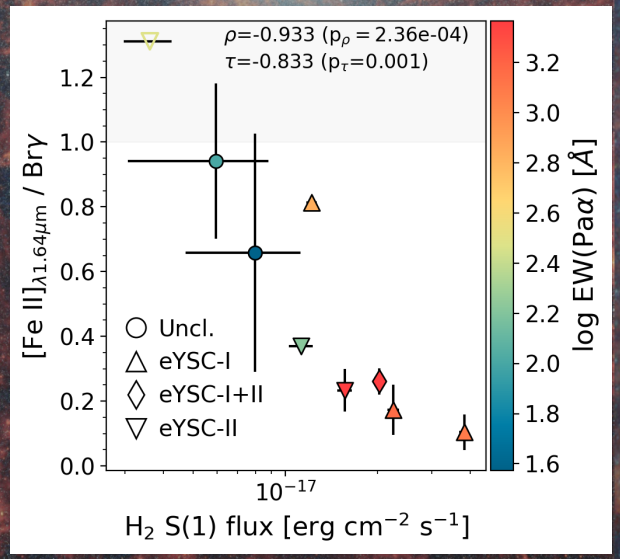
JWST allow us to probe emerging young star cluster at unprecedented detail in nearby galaxies



Scan for paper!



The surrounding ISM is evolving alongside young star clusters, as they emerge from their natal cloud



Pre-supernova feedback is already important in helping eYSCs clear molecular clouds, before the first supernova

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