# An HST-dark galaxy merger revealed by ALMA

Ivanna Langan

Supervised by Gergö Popping, Michele Ginolfi
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NASA, Holland Ford (JHU), the ACS Science Team and ESA

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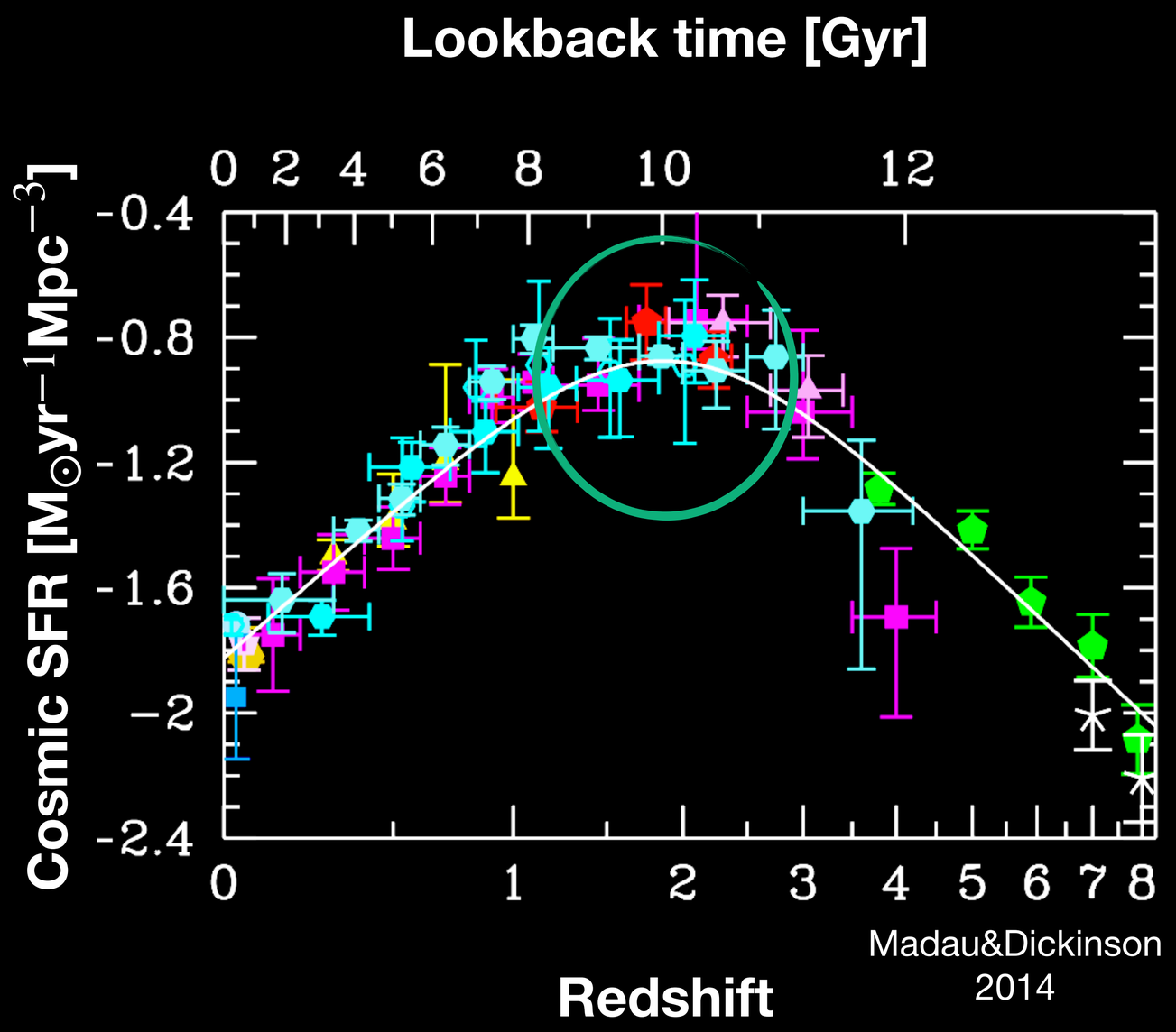
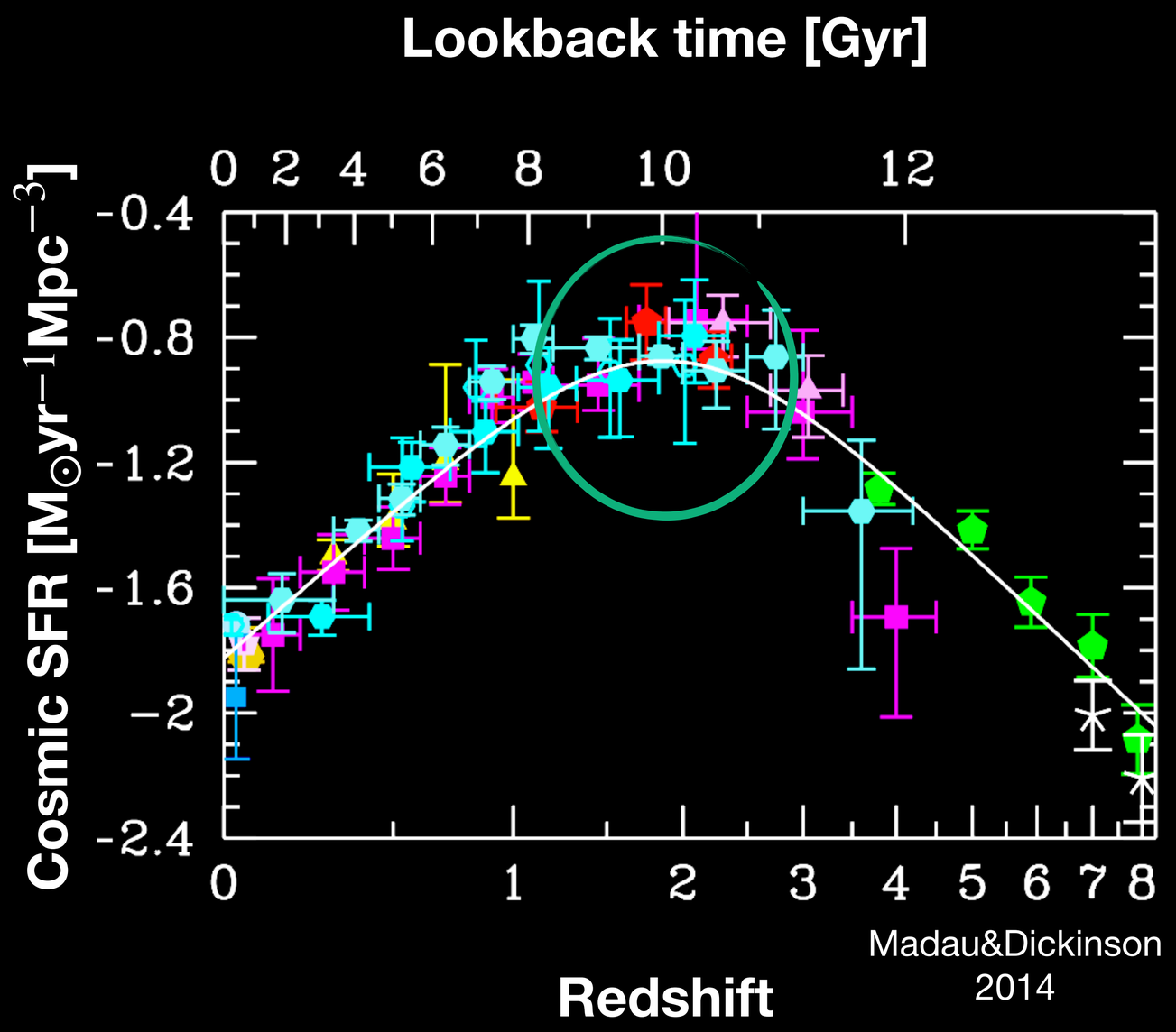
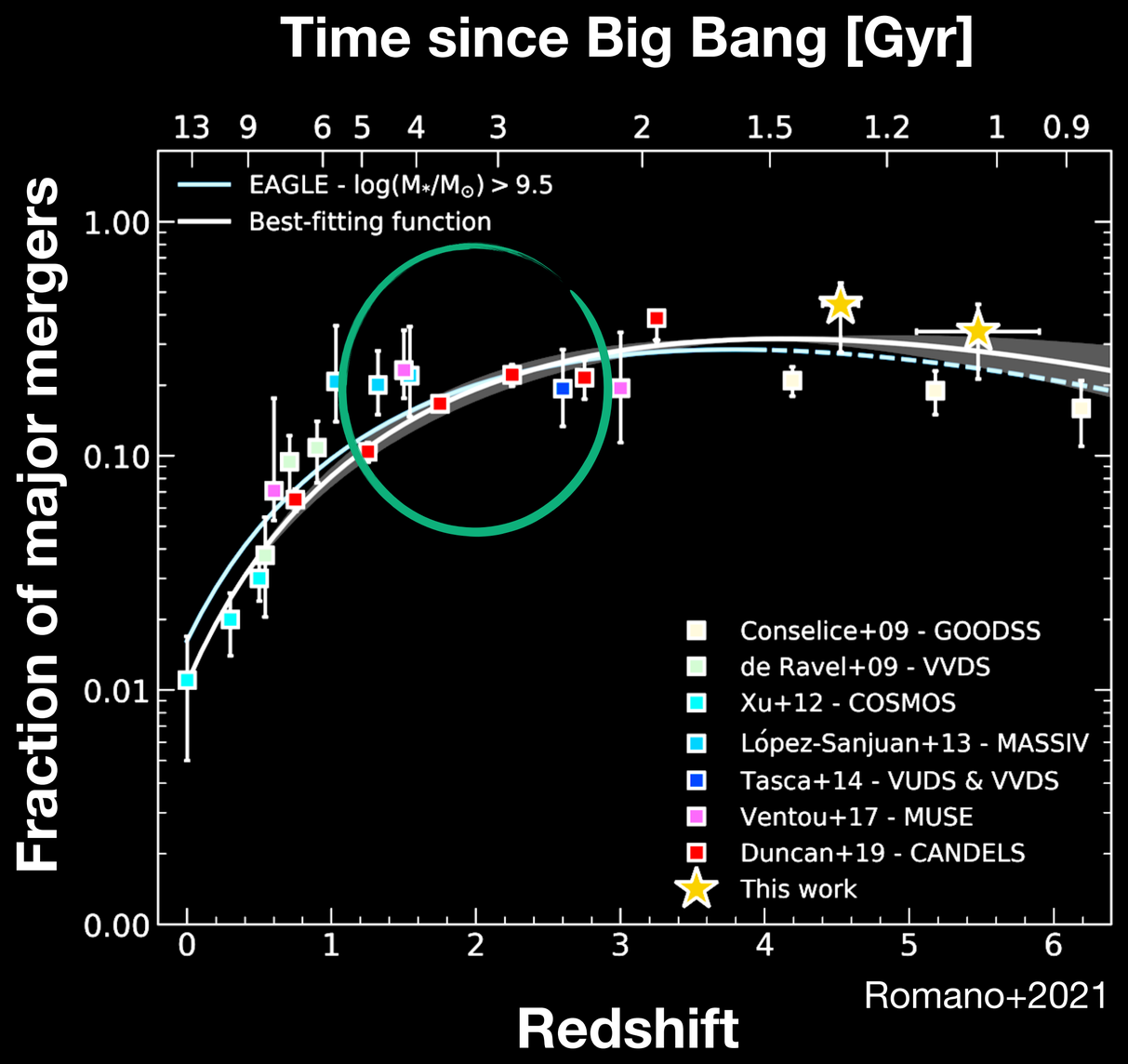



Madau&Dickinson 2014

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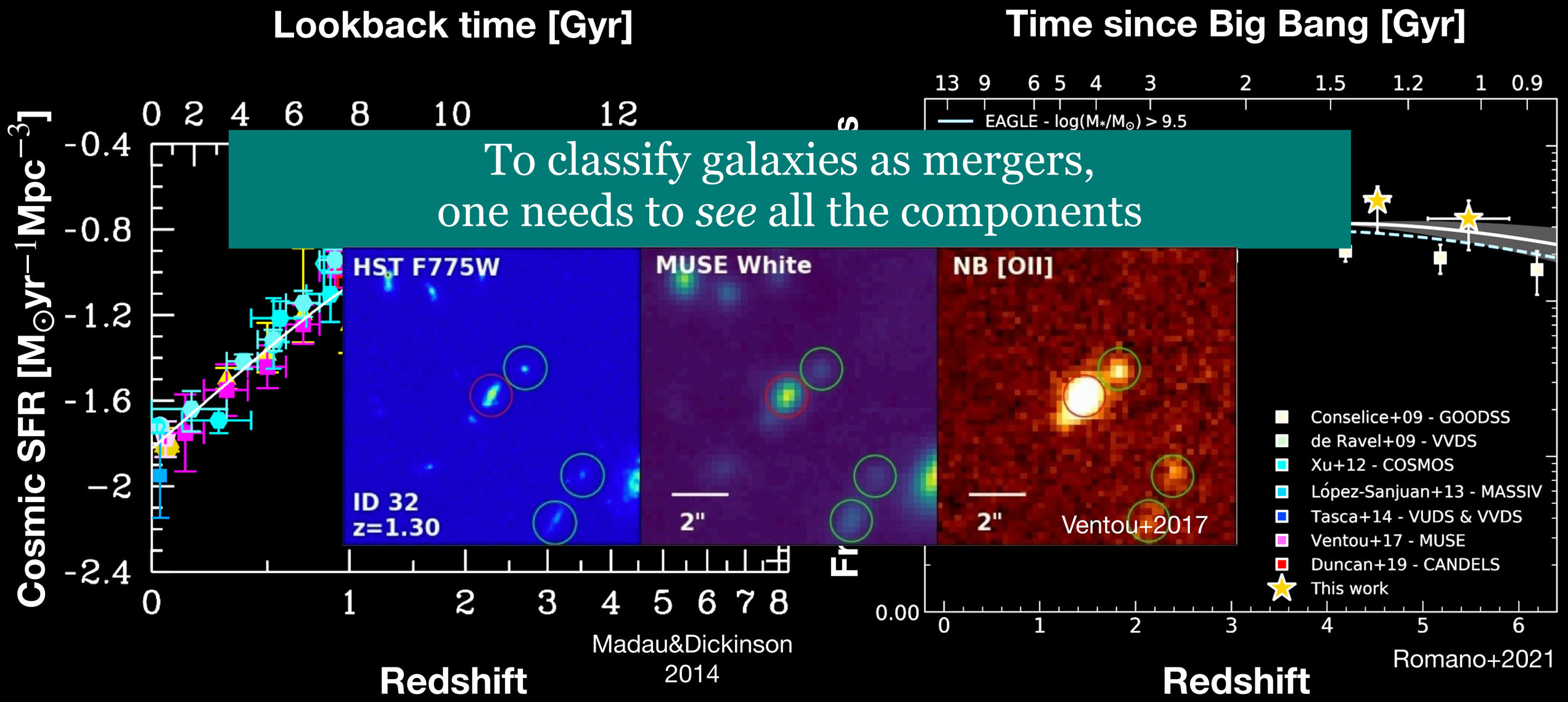
To classify galaxies as mergers,
one needs to *see* all the components

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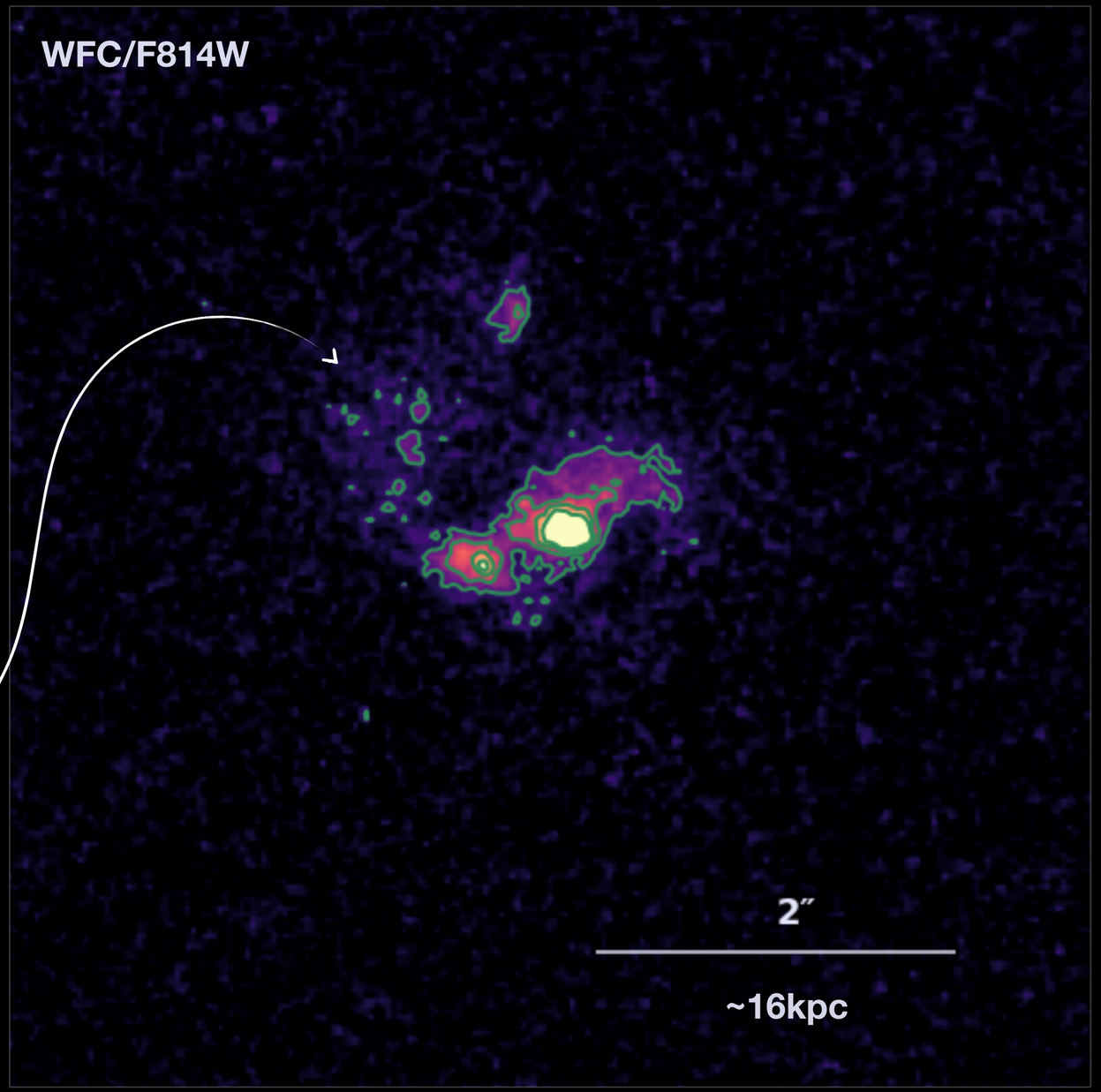
# HST image

A z = 1.17 star-forming galaxy!
Is that a tail?

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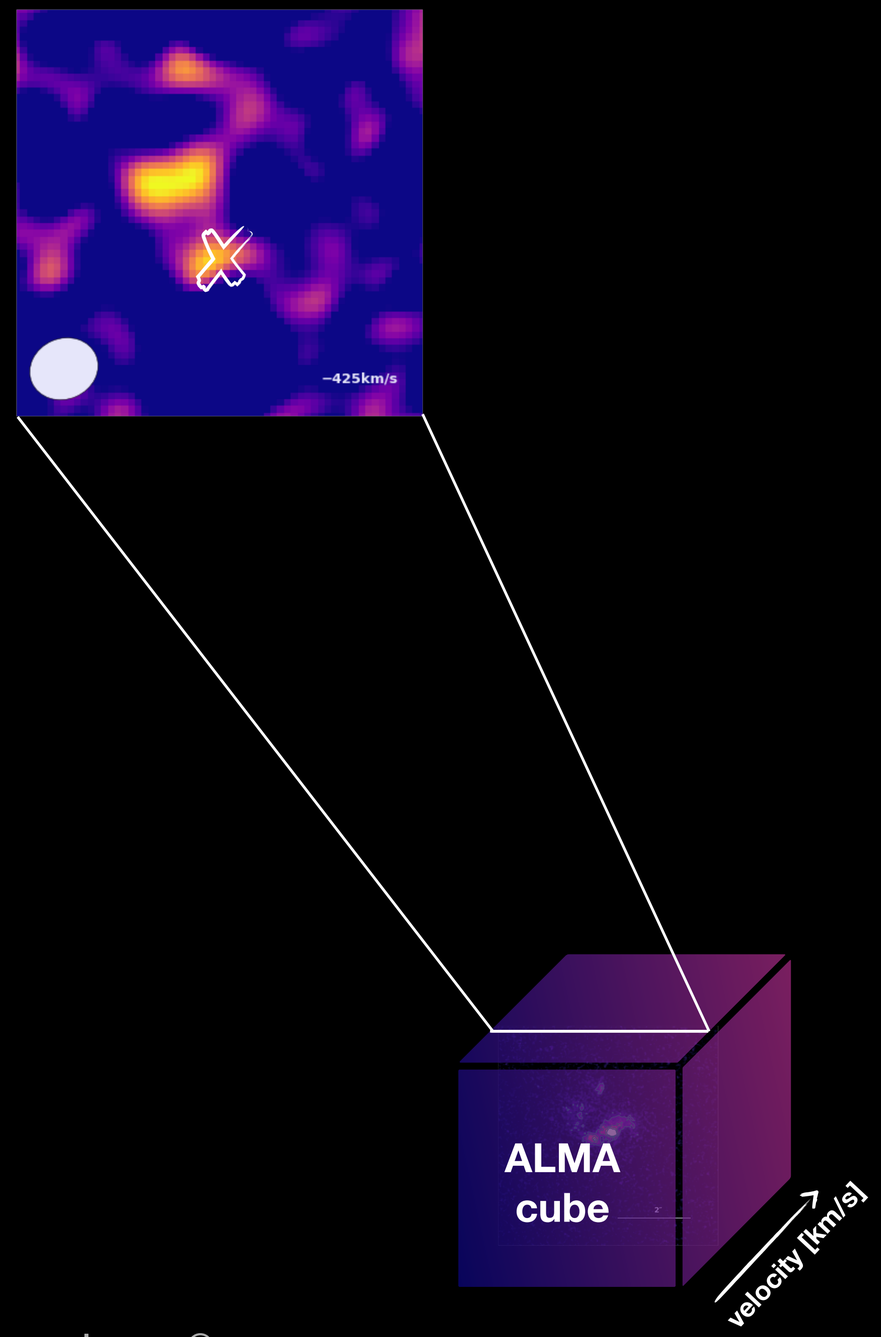


# ALMA CO(2-1) images: channel maps

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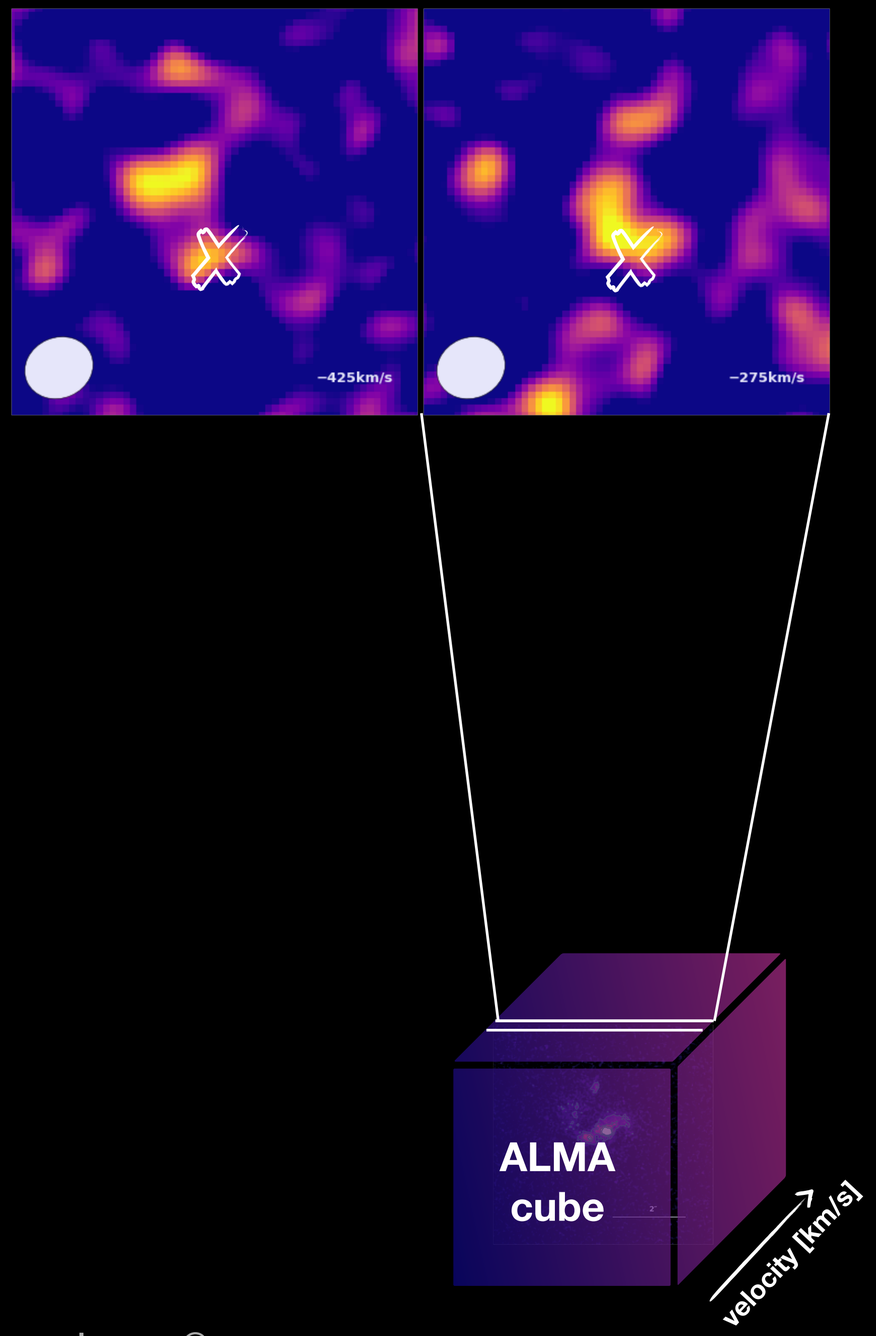


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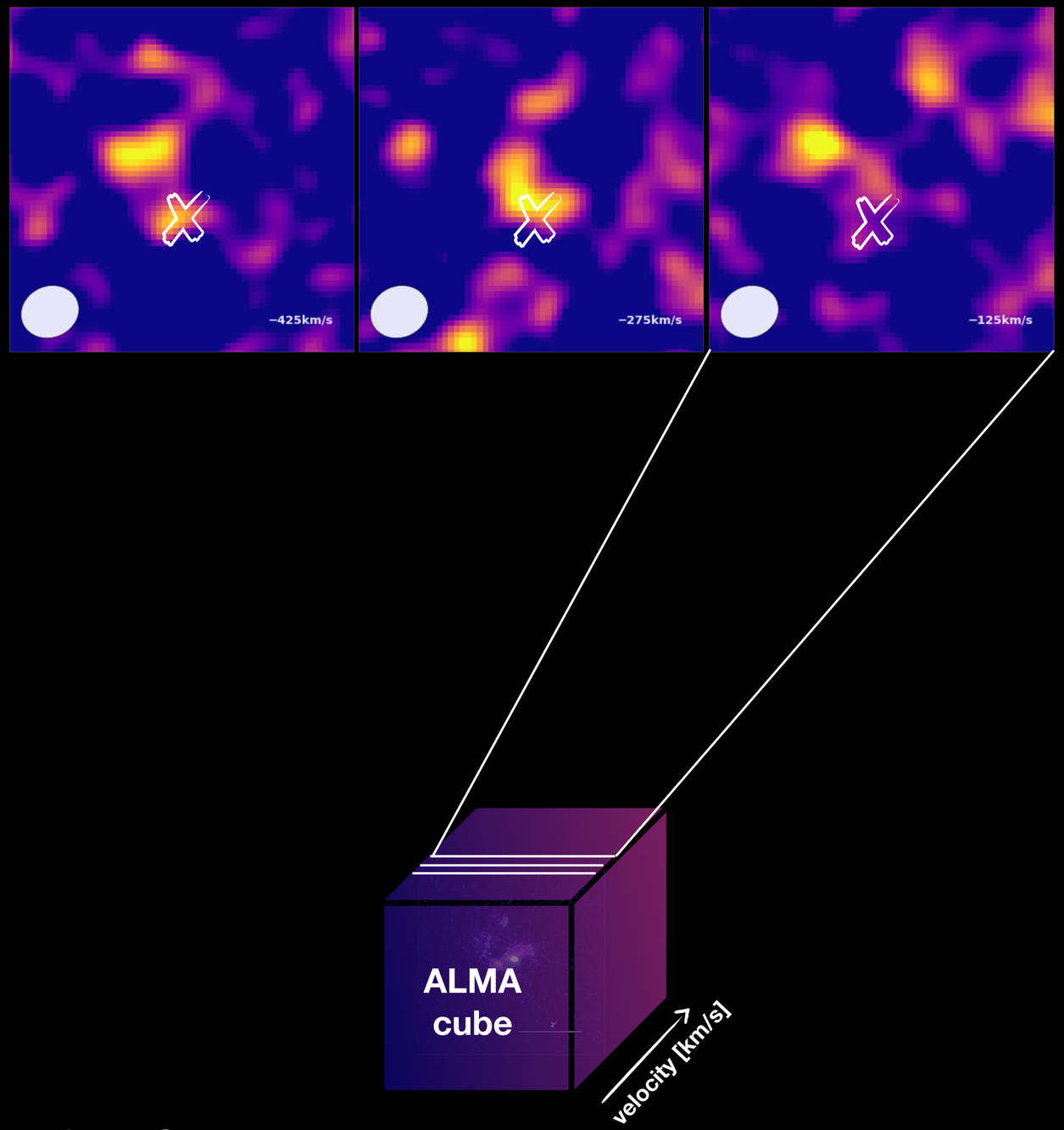


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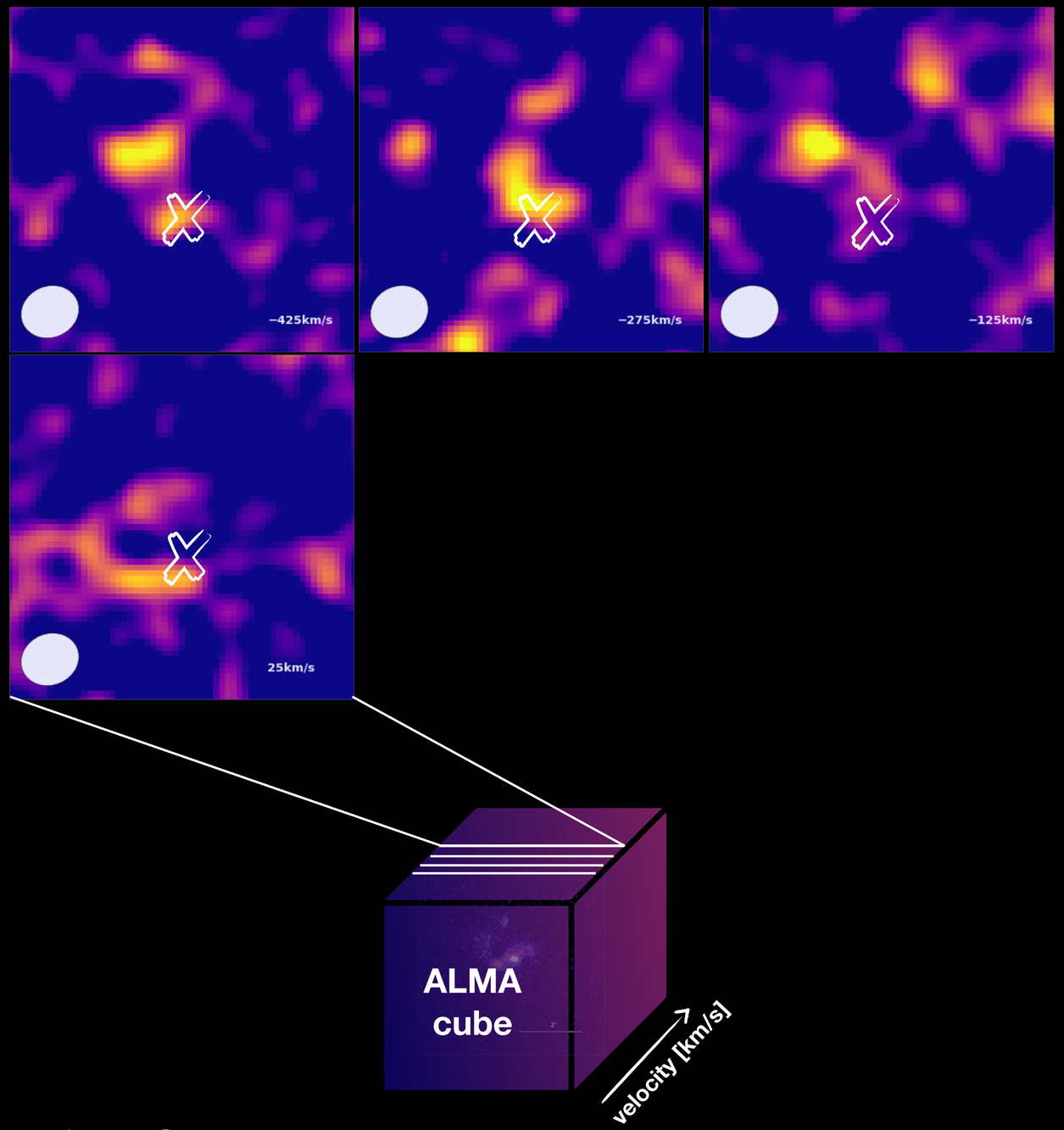


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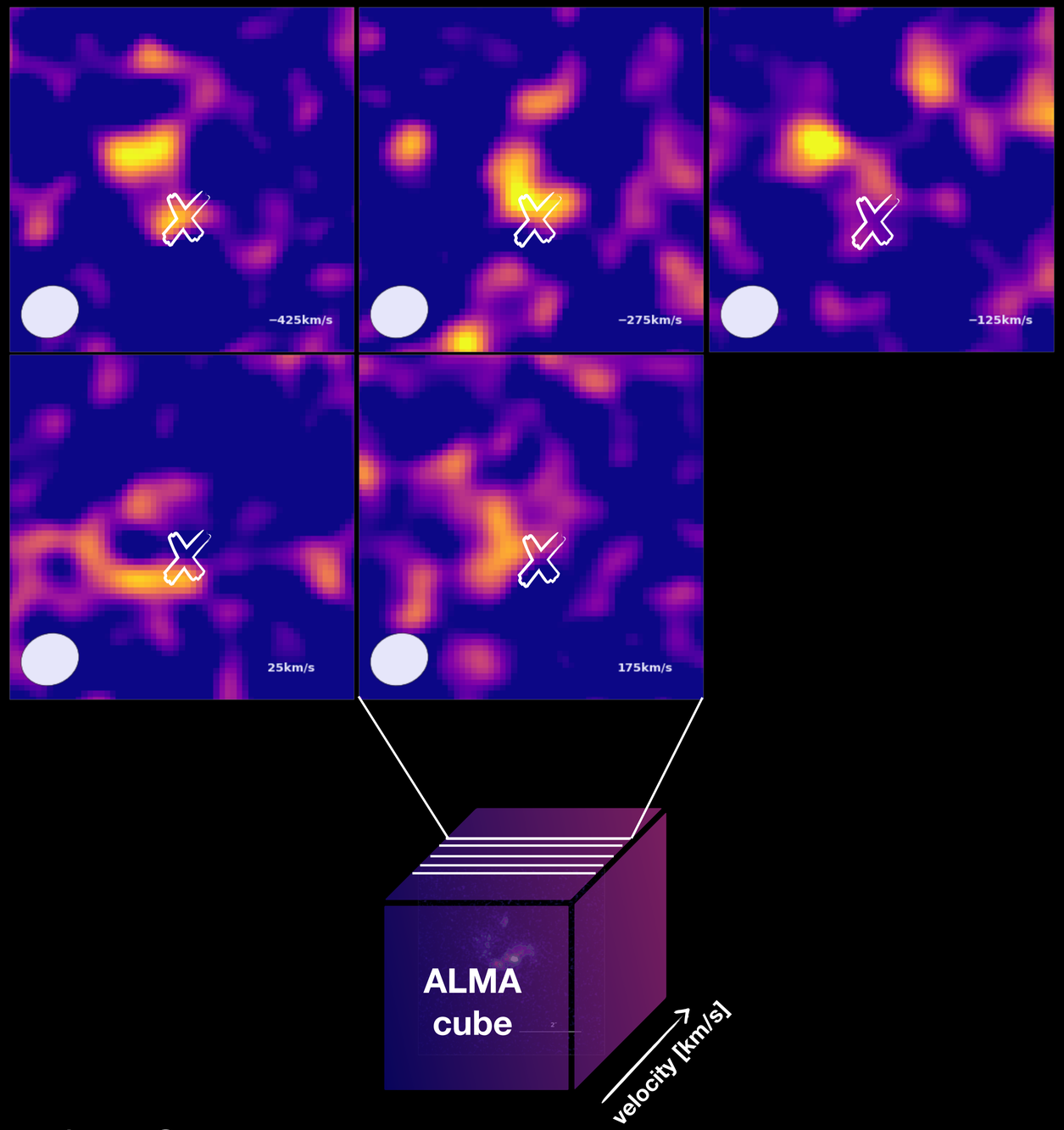


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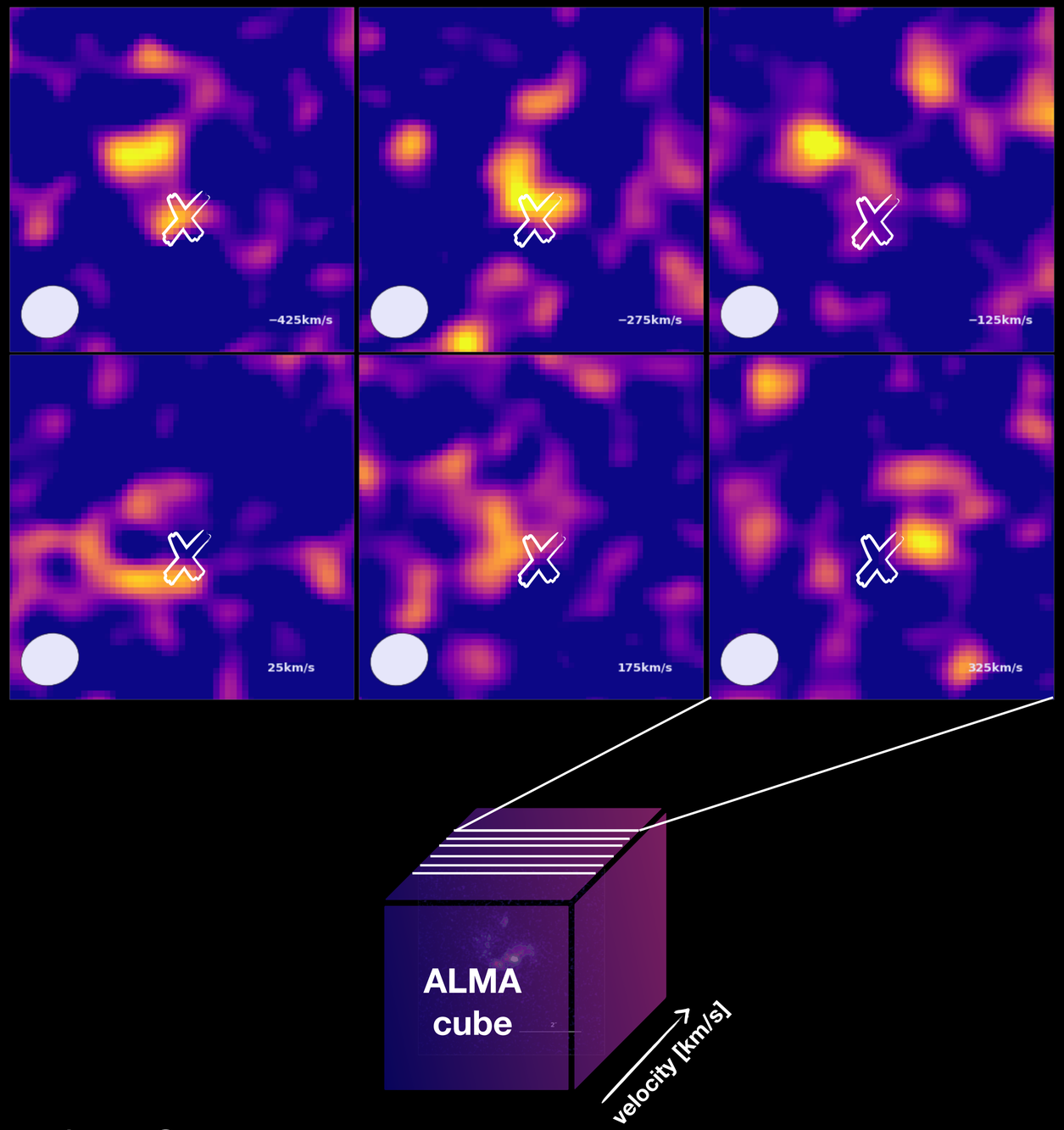


# ALMA CO(2-1) images: channel maps

CO(2-1) emission doesn't only come from where we expect it!

Another galaxy?

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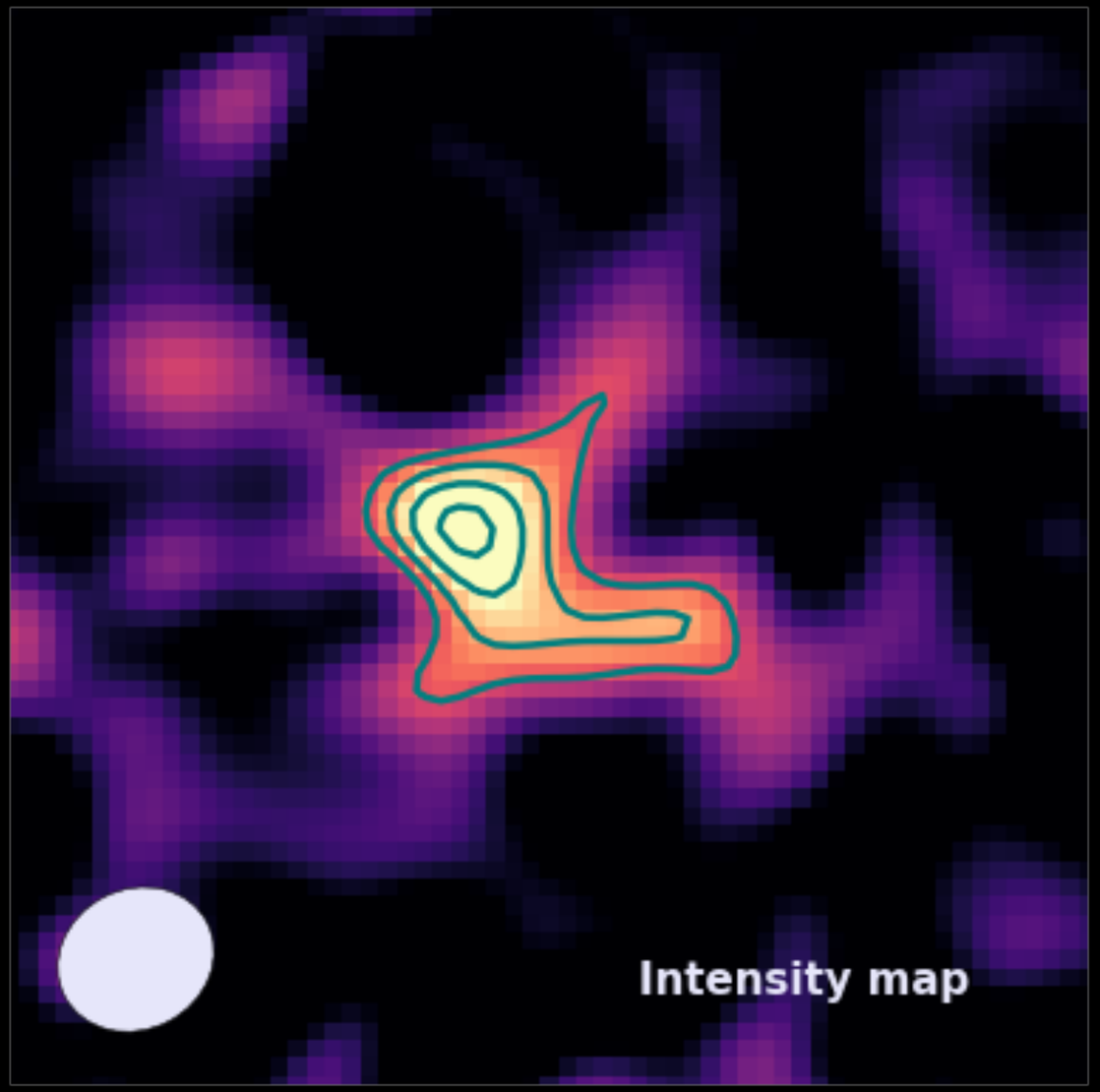
# ALMA images: moment 0 maps




Langan+in prep.

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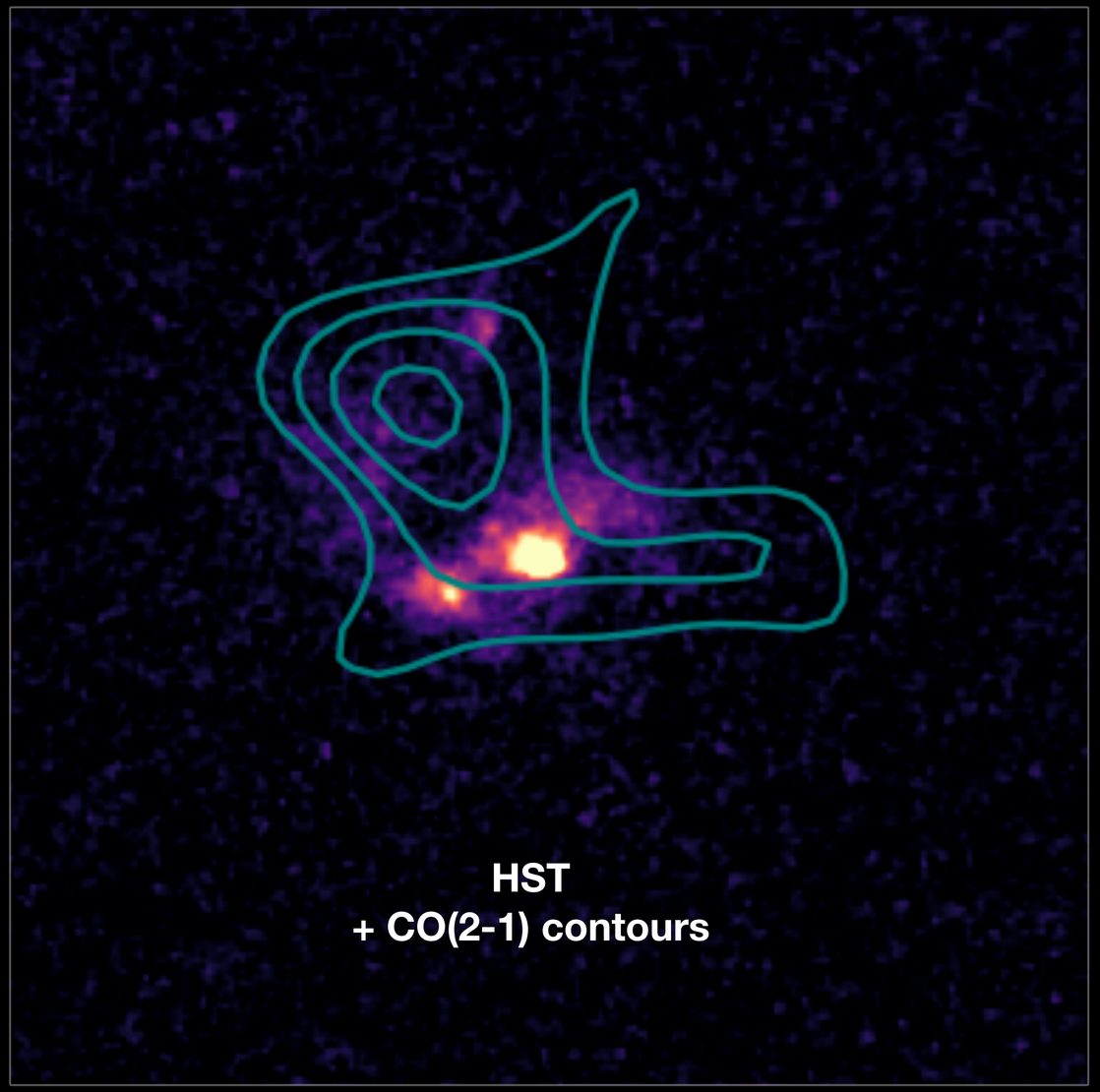
# ALMA images: moment 0 maps

Indeed, disturbed and extended morphology!

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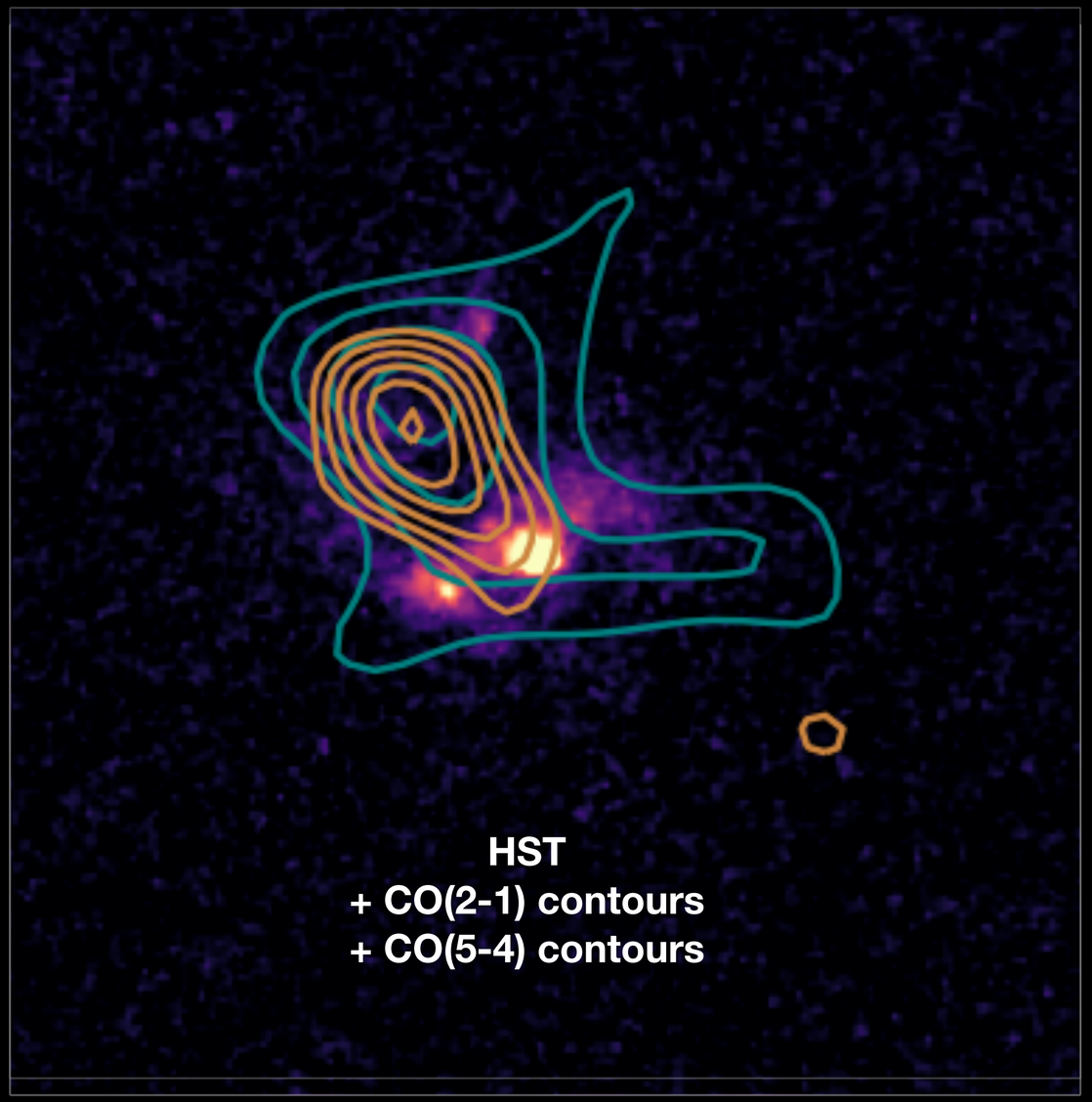


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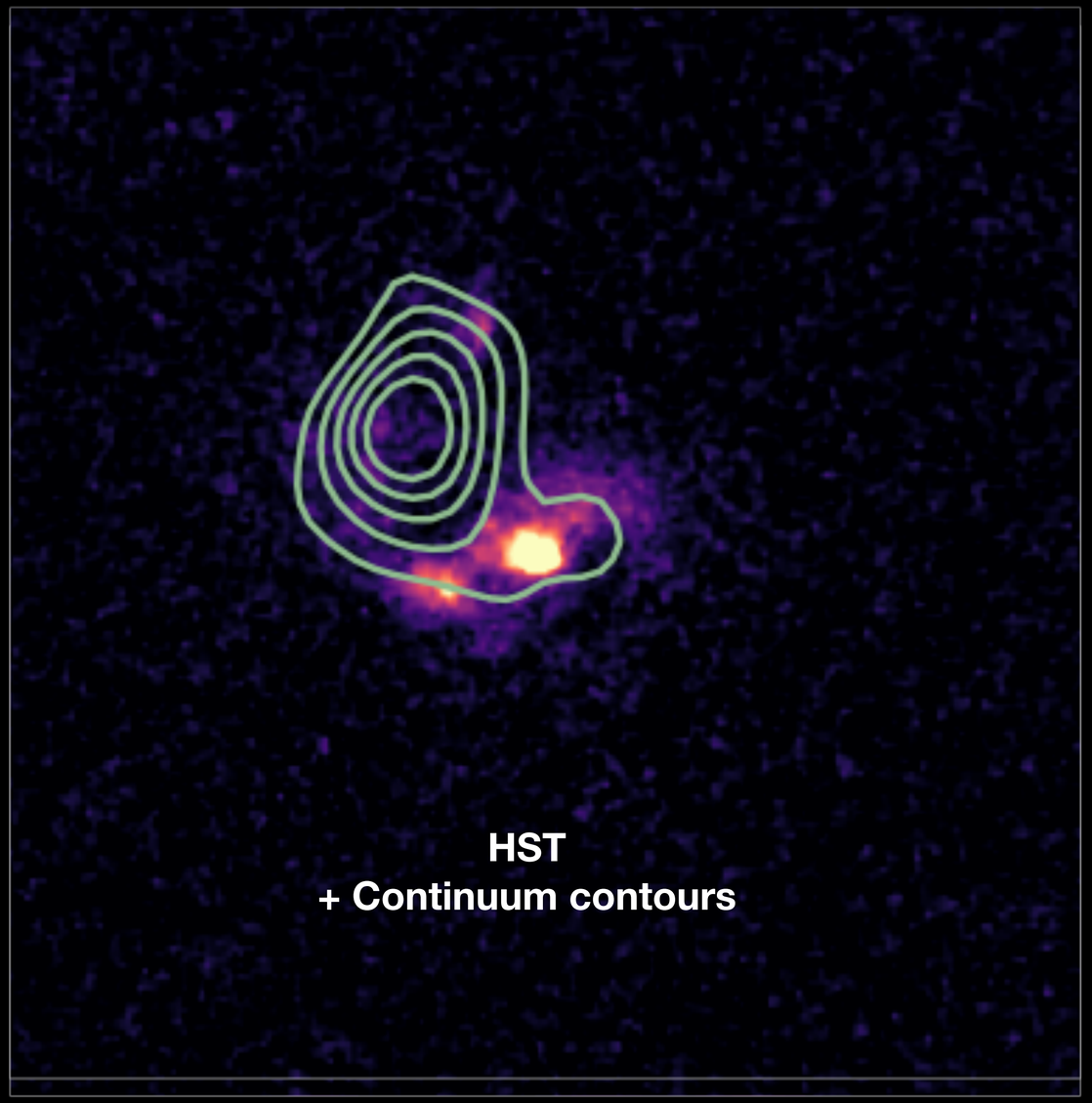
# ALMA images: moment 0 maps

Indeed, disturbed and extended morphology!

And the dust peaks *exactly* where we are blind in HST.

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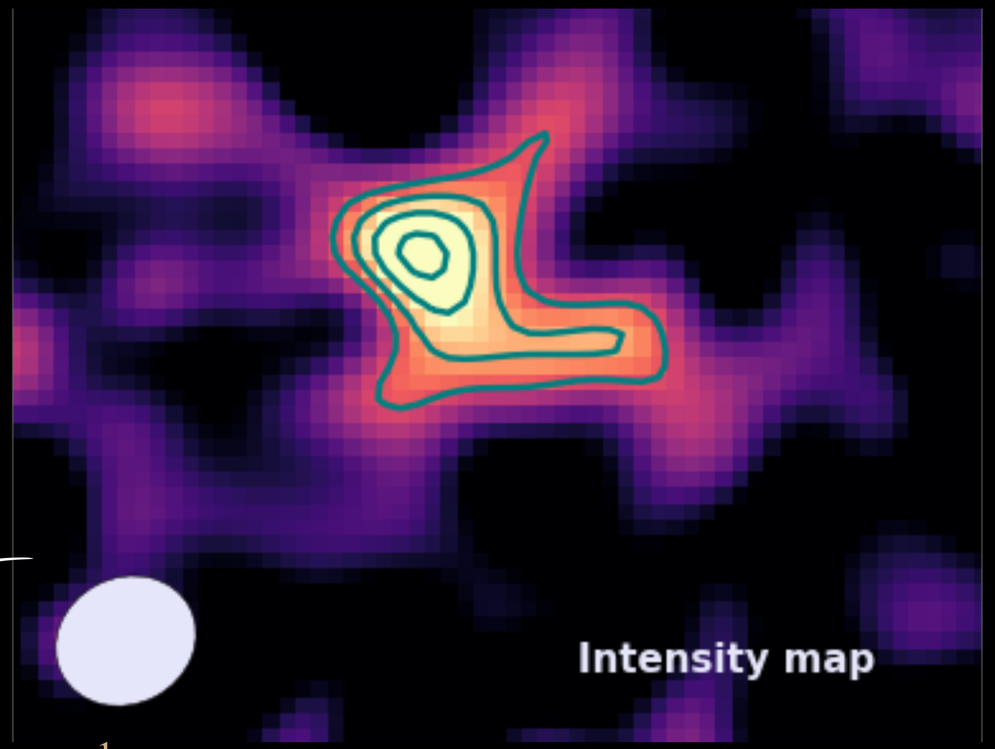


$\alpha_{CO} \sim 1$

$\alpha_{CO} = 3.68$

**Bolatto+2013**

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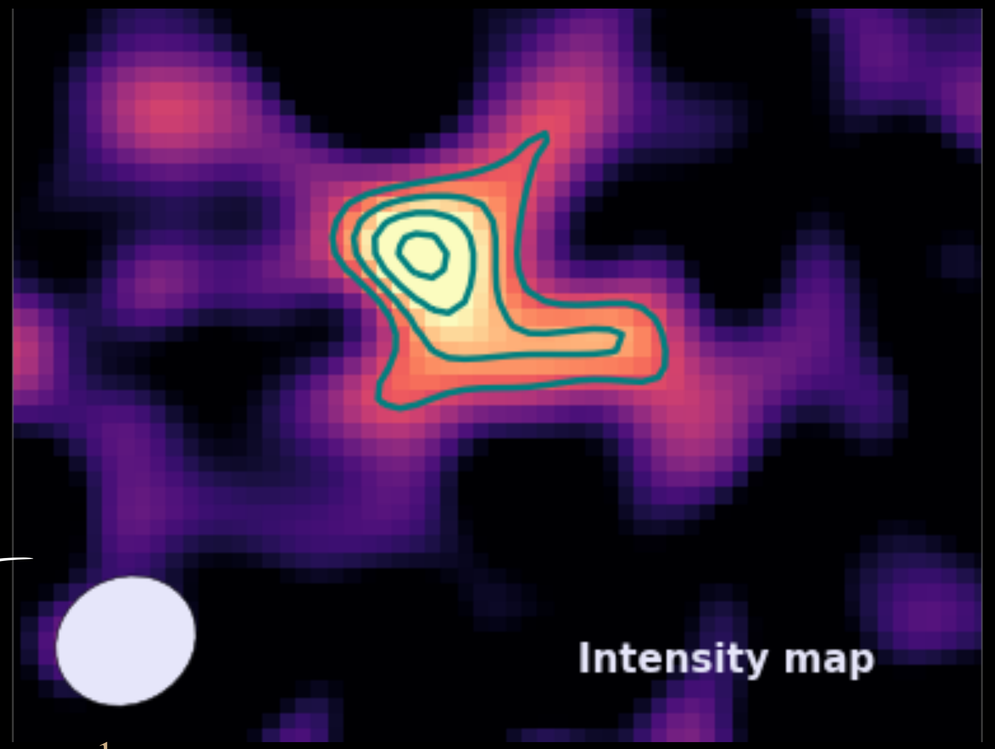


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Langan+in prep.

Northern galaxy: $M_{H_2} \approx 1.20 \times 10^{11} M_\odot$

Southern galaxy: $M_{H_2} \approx 5.05 \times 10^{10} M_\odot$

Mass ratio $\mu = 2.4$: Major merger

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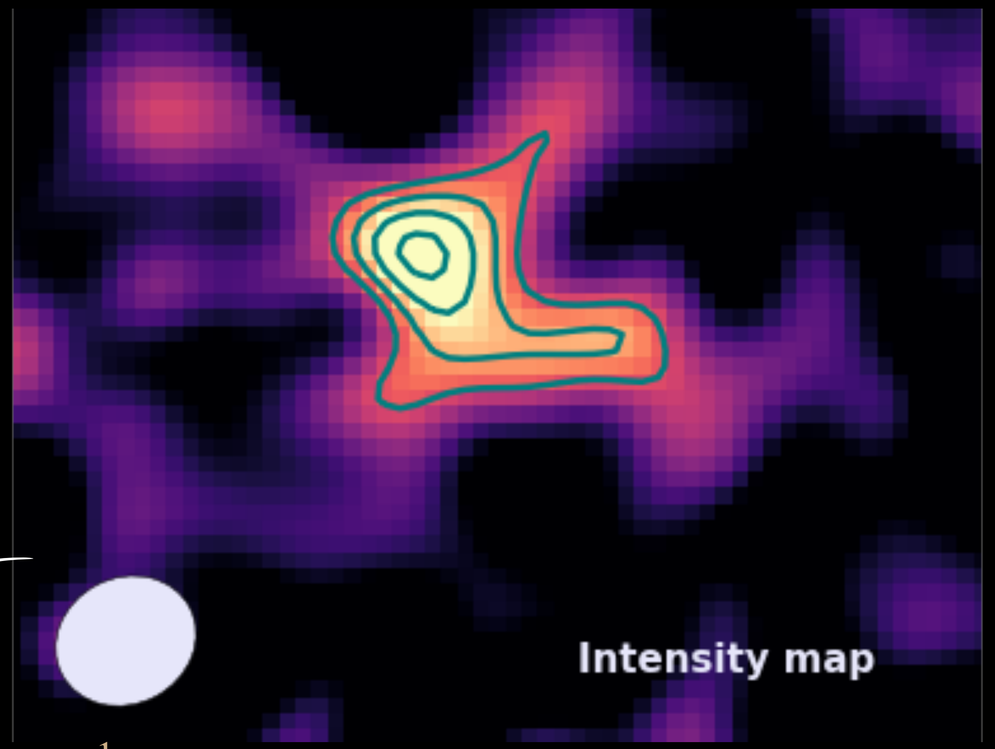


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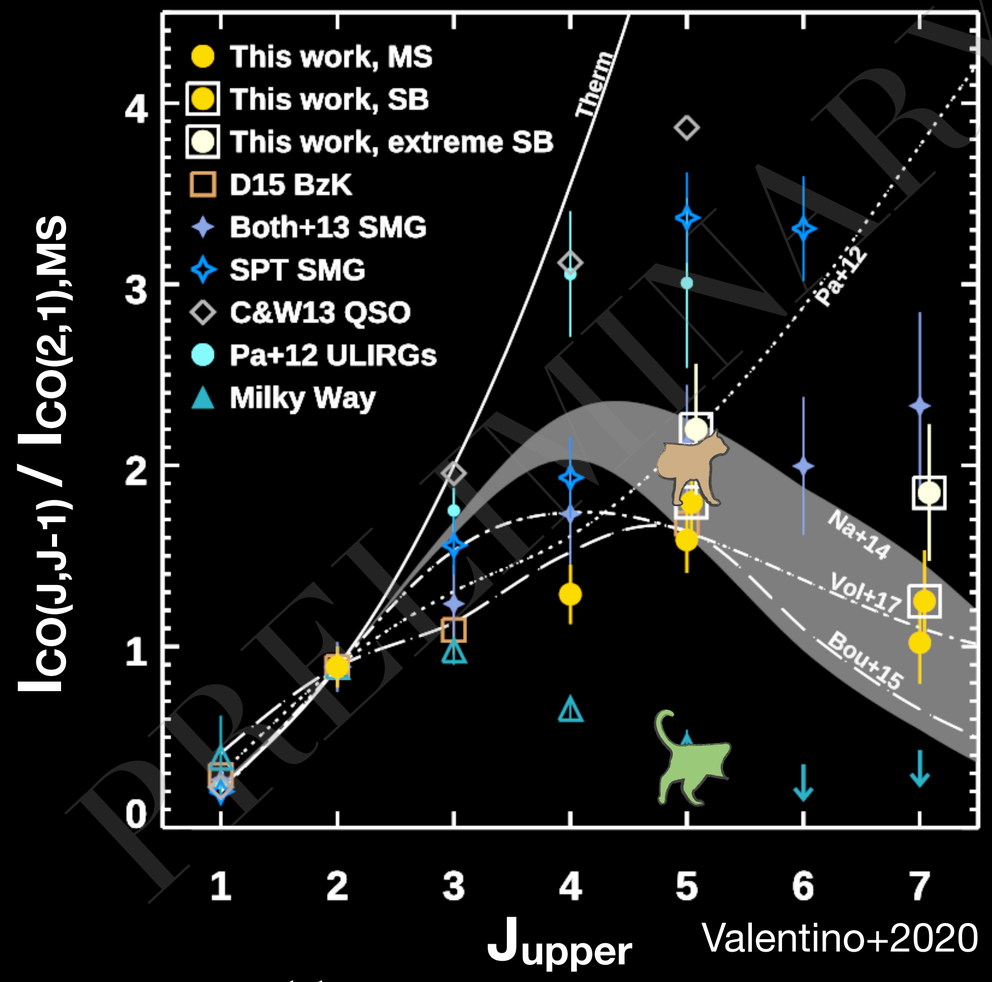
Langan+in prep.




Valentino+2020

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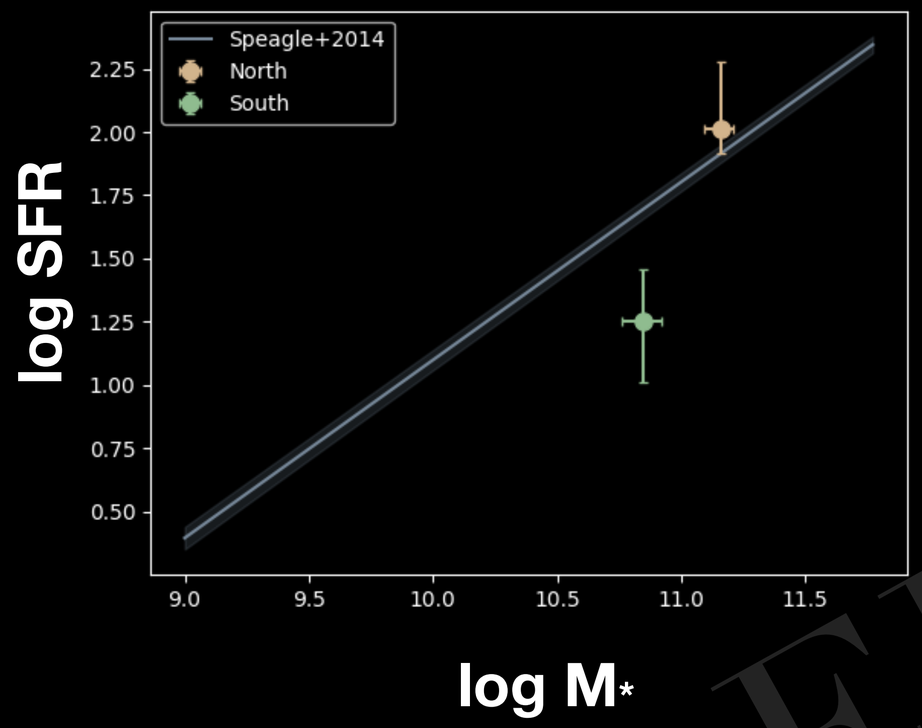
# Matilda in context

Deblending w/ PhoEBO
See Gentile+subm. and his talk last Tuesday!




PRELIMINARY

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Langan+in prep.

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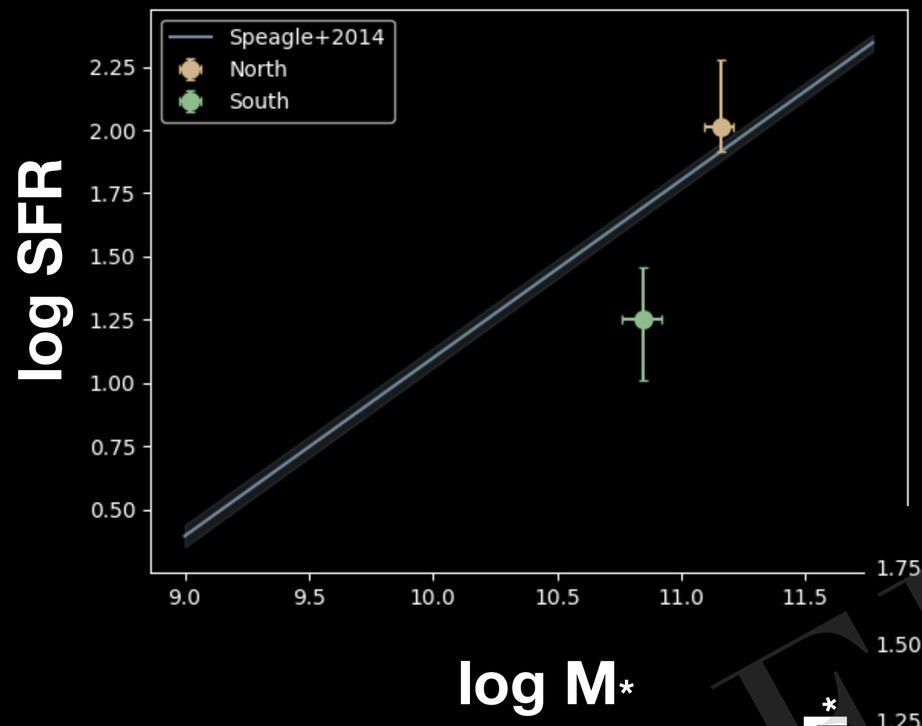


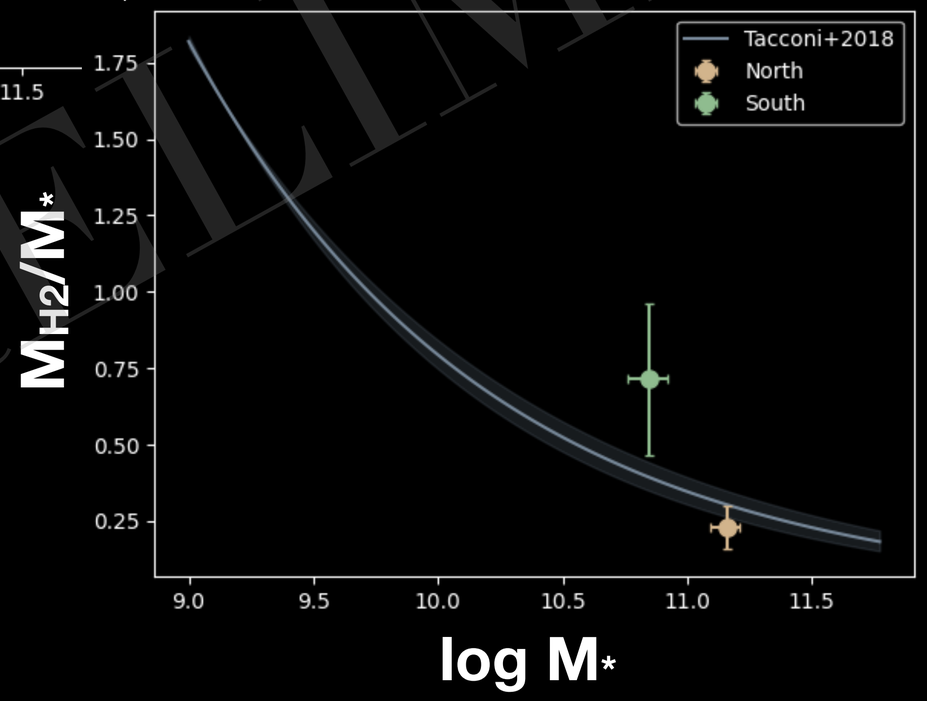


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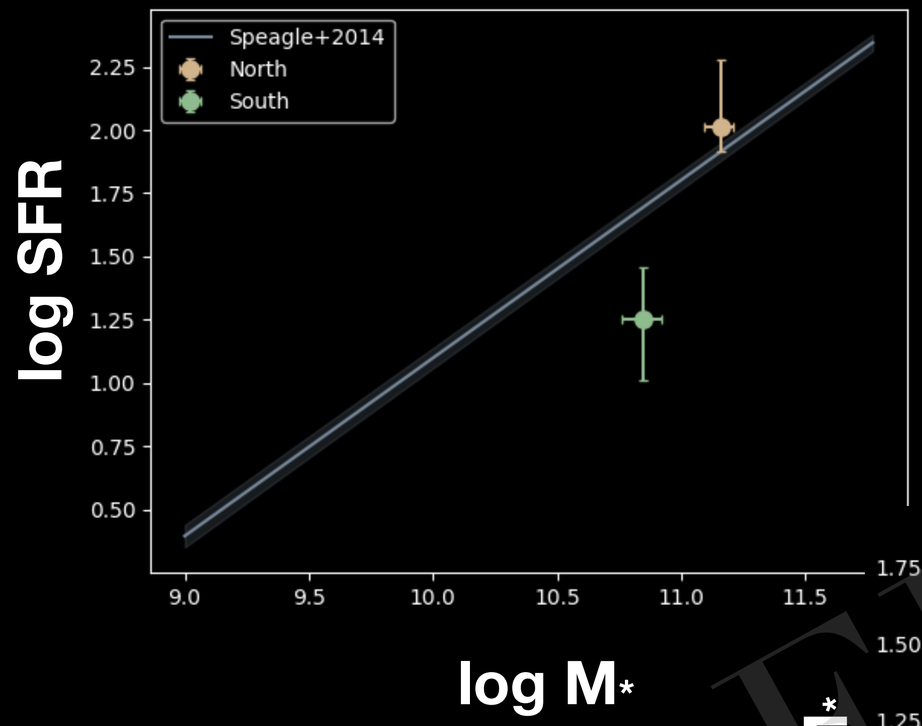


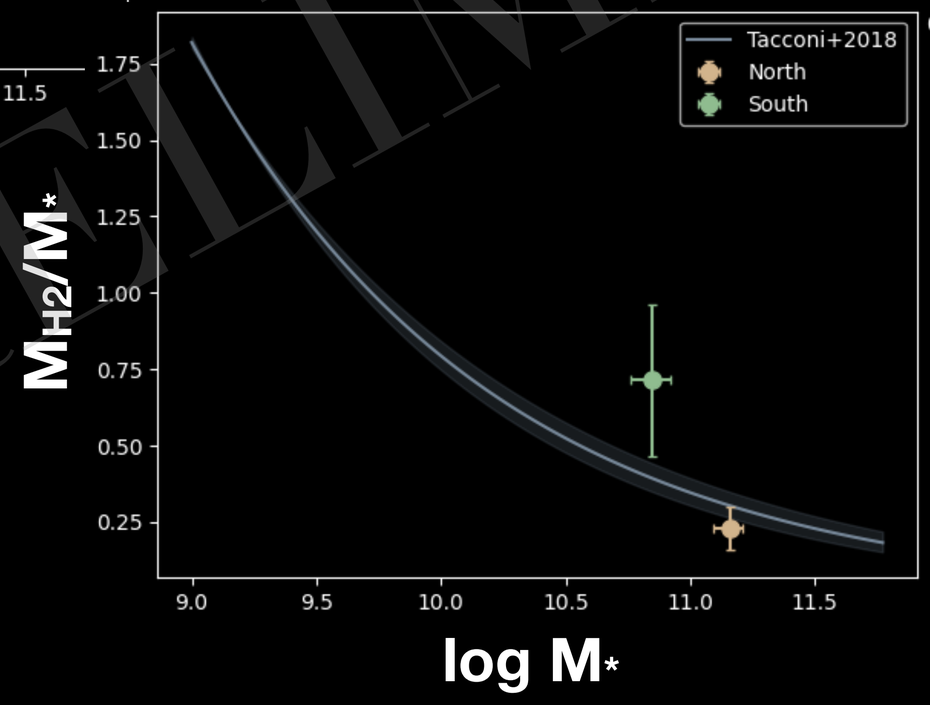


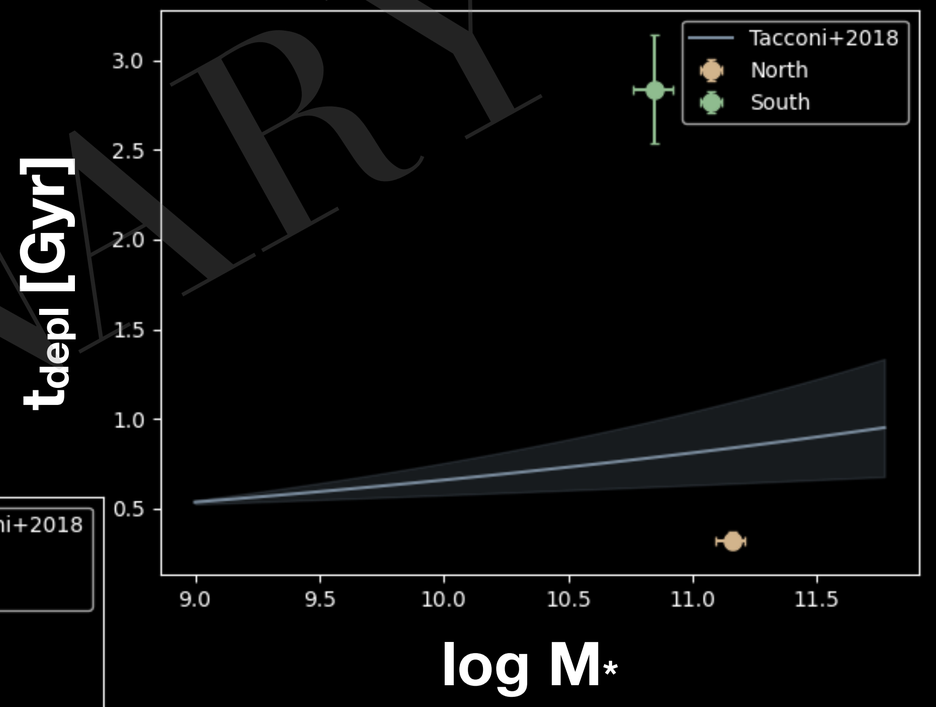


PRELIMINARY

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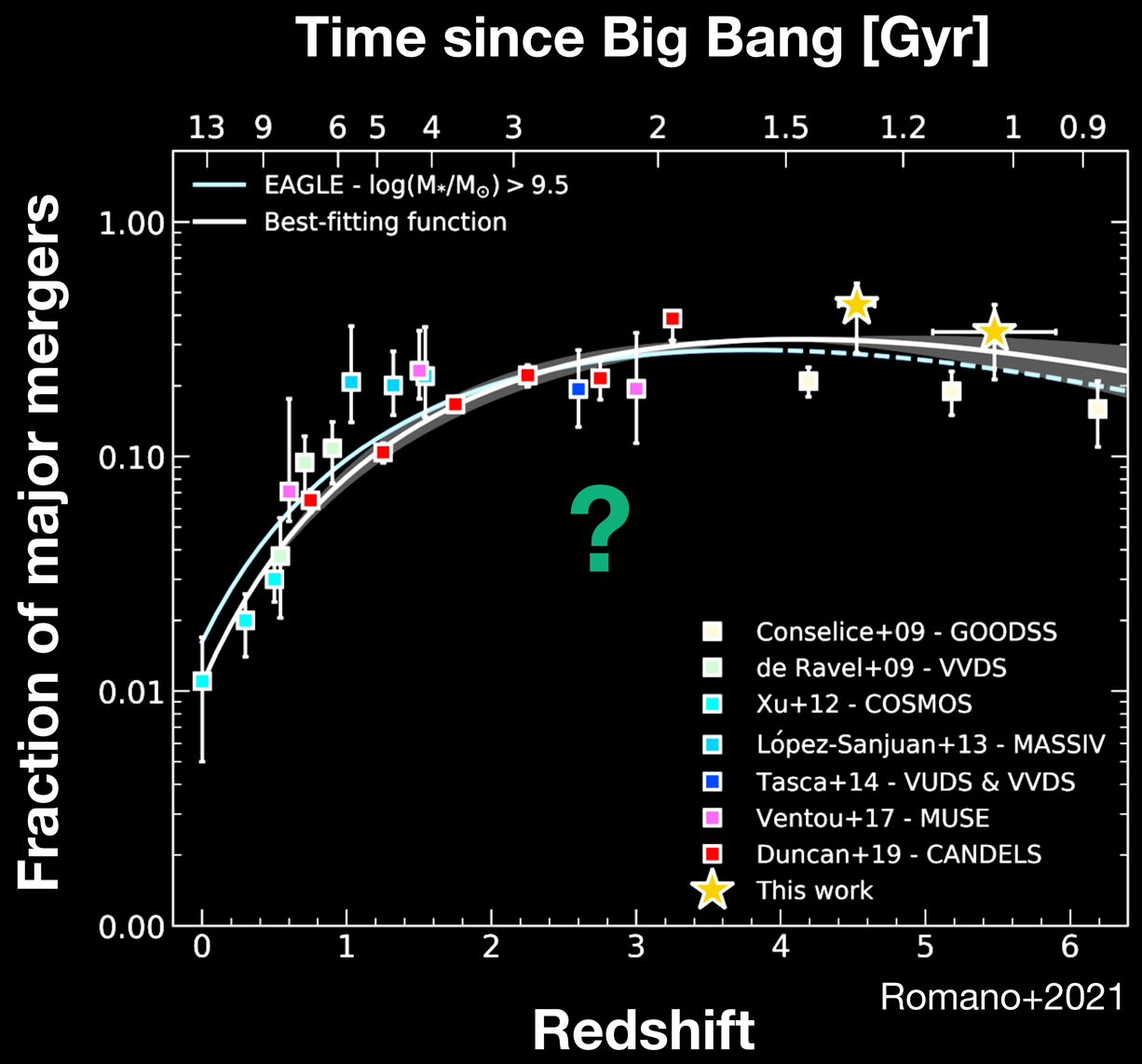
Matilda is a perfect example of how critical it is to have multi-wavelength data to get the full picture of the evolution of galaxies.




Romano+2021

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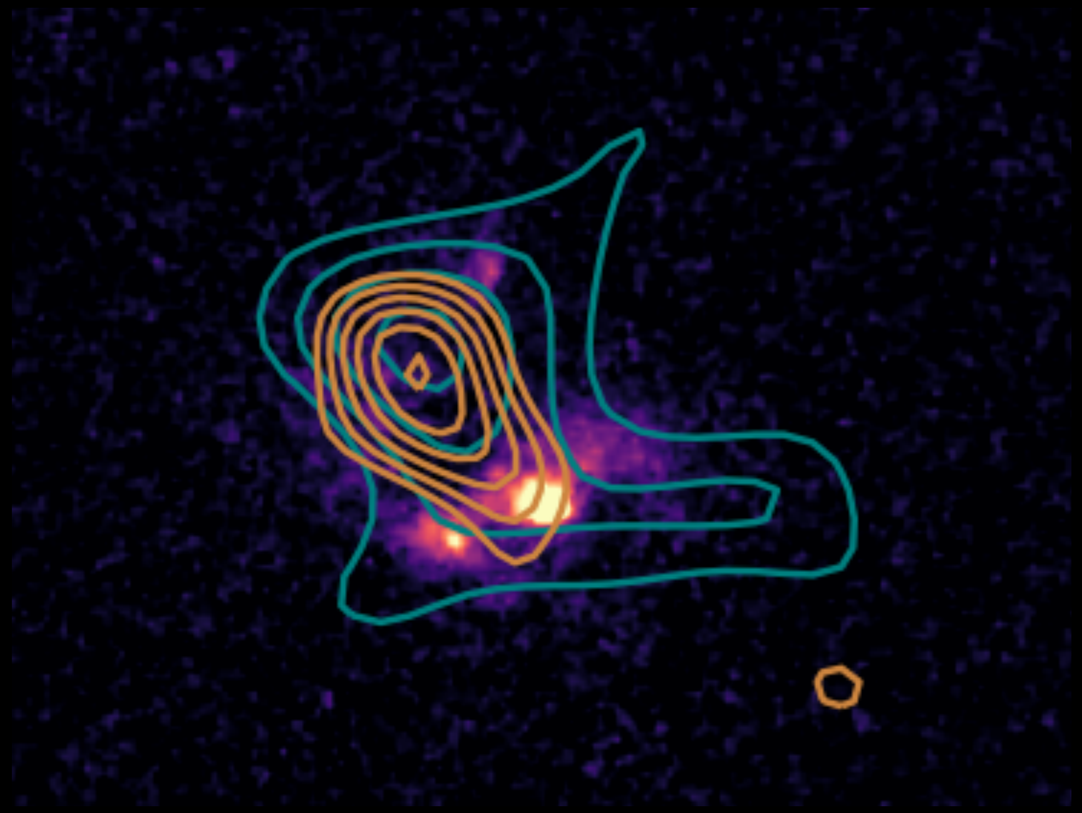
# What we are learning

- We need mm observations to catch dusty galaxy mergers
- The fraction of mergers could be different
- The ISM and SF states of the components of a merger can be very *different*



Thanks for your attention!

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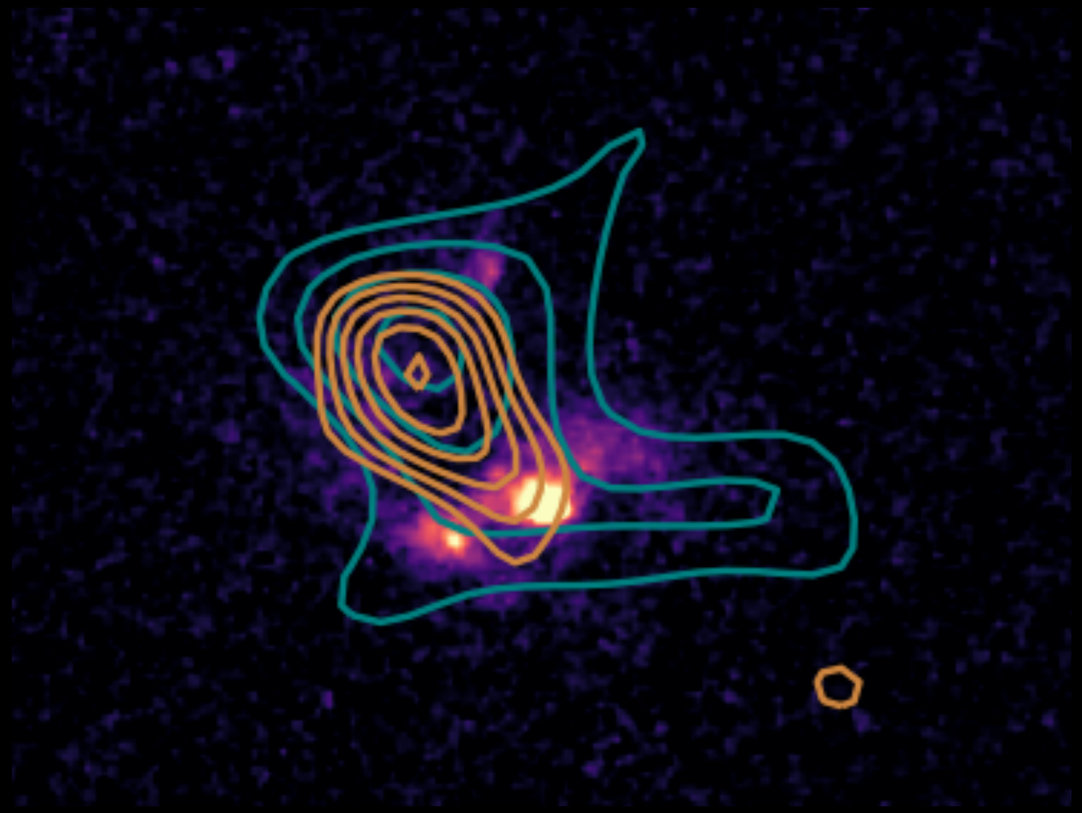

PI of an *accepted* XShooter proposal to measure the metallicity: what is the impact of mergers on the metal content?

Thanks for your attention!

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